University of Agronomic Sciences
and Veterinary Medicine of Bucharest

Faculty of Horticulture

170 years

International Conference

"Agriculture for Life, Life for Agriculture"

BOOK OF ABSTRACTS

Section 2

HORTICULTURE

2022
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SUMMARY

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FRUIT GROWING

RESEARCH REGARDING THE INFLUENCE OF LOCAL CONDITIONS ON SEVERAL QUALITY INDICATORS FOR APPLES

Carmen-Maria-Andrada ALBULESCU, Dorel HOZA

University of Agronomic Sciences and Veterinary Medicine of Bucharest,
59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: albandrada1@gmail.com

Abstract

Apple is one of the most important fruit growing species from the northern hemisphere. Fruit quality is important for capitalization, which is why technologists are trying to ensure, using technology, the best possible conditions to produce qualitative apple fruits. The current research presents a comparison of fruit quality for four varieties: Florina, Generos, Red Topaz and Redix, cultivated in three areas: Pitesti, Bucharest and Moara Domneasa. Fruit quality was influenced by the culture area, but also largely by the climatic year. Fruit size had values within the limits of each variety for all three areas, but the location had a different influence on this parameter. Dry soluble substance had higher values recorded for the varieties Florina and Redix cultivated in Bucharest area, while the varieties Generos and Red Topaz for Pitesti area. Fruit firmness was better for the fruit obtained in Pitești area (hilly area), compared to the other two areas, Bucharest and Moara Domnească (lower areas), while the content in anthocyanins and polyphenols was influenced more by the culture conditions than by the varieties' characteristics.

Key words*: fruit quality, fruit weight, biochemical characteristics.*

AN OVERVIEW OF APRICOT BREEDING PROGRAMS FOCUSED ON PRODUCTION IMPROVEMENT, FIELD RESISTANCE AND HIGH-QUALITY FRUITS

Imad AL-SUWAID[1], Ana BUTCARU[1], Cosmin MIHAI[1], Nazar AL GHASHEEM[2], Florin STĂNICĂ[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania
[2]College of Agricultural and Marshlands, University of Thi-Qar, Iraq

Corresponding author email: anabutcaru@gmail.com

Abstract

Scientific knowledge through studies and fundamental and applied research has revolutionized plant breeding over the past decades. Given the importance of the fruits for their nutritional, health, and industrial value, the apricot breeding programs evolved continuously. The integrated use of actual gene banks, multiple crossings, selection, and the use of genetic engineering programs lead to improve apricot trees performance. Meanwhile, the obtention of resistant cultivars to harsh environmental conditions and climate changes, especially to hard winter temperatures and late frosts, disease-resistant, with early maturity, high-quality fruits, and large production is the main objective. This article aims to provide an overview of achievements in breeding and improving the production of apricot fruits in the world, highlighting the modern challenges in apricot orchards. Recently, digitalization and mechanization can be involved as useful tools in breeding studies and orchard monitoring and management.

Key words*: core collection, crossing, early selection, disease-resistant, digitalization.*

CONTENT OF BIOLOGICALLY ACTIVE COMPOUNDS IN THE LEAVES OF 'WILLAMETTE' AND 'MEEKER' RASPBERRY CULTIVARS

Stanislava ATANASOVA[1], Maria GEORGIEVA[2], Diyan GEORGIEV[2]

[1]Faculty of Agriculture, Trakia University, 6015, Stara Zagora, Bulgaria
[2]Research Institute on Mountain Stockbreeding and Agriculture,
281 V. Levsky Str, 5600, Troyan, Bulgaria

Corresponding author email: stanislava.atanasova@trakia-uni.bg

Abstract

The present study observed the content of biologically active compounds in raspberry leaves in different phenophases (full blossoming, fruit harvesting and after fruit harvesting) and two stages of agrotechnics (0.50 m, 0.30 m). The study was conducted during the period 2019-2020 in a collection plantation of the Research Institute of Mountain Stockbreeding and Agriculture in Troyan with two introduced raspberry cultivars 'Willamette' and 'Meeker'. The field experiment is based at intra-row spacings between plants (0.50 m and 0.30 m) and inter-row spacings of 3.00 m. The content of biologically active compounds in the leaves was found during the phenophases: full blossoming, fruit harvesting and after fruit harvesting. The results show that the highest content of the studied indicators chlorophyll "a", chlorophyll "b" and β carotene in the leaf samples is the cultivar Willamette, with a variant of 0.50 m, respectively (2.56 mg/g FW, 1.62 mg/g FW, 1.44 mg/g FW), from 2019 in the phenophase of full blossoming of plants. In the Meeker cultivar, the highest content of chlorophyll "a" and β carotene was found from the variant of 0.50 m in 2019 in the phenophase of full blossoming (1.80 mg/g FW, 1.10 mg/g FW) and chlorophyll "b" from the same variant after fruit harvest for 2020 - 1.04 mg/g FW.

Key words: *raspberries, cultivars, agricultural techniques, biologically active compounds in the leaves.*

FREEZE DRIED SWEET CHERRY QUALITY DURING STORAGE

Andreea BARBU[1], Mihai FRÎNCU[1], Violeta Alexandra ION[1], Andrei PETRE[1], Mihaela ZUGRAVU[1], Liliana BĂDULESCU[2]

[1]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: mihai.frincu@qlab.usamv.ro

Abstract

Sweet cherry fruits are one of the most consumed and appreciated non-climacteric fruit in the world due to delicious taste and high nutritional quality. The aim of this paper is asses the influence of storage period on quality parameters stability of freeze dried organic and conventional sweet cherry fruits. Three sweet cherry cultivars 'Superb', 'Daria', and 'Severin' were harvested in June 2020, washed, cored, cut in half, packed and rapidly freeze at –80°C in order to be freeze dried, using the following parameters: -55°C and 0.5 mbar for 70 hour. The freeze dried samples were stored in the dark at 21 ± 2°C and analysed immediately after freeze drying, and after 2, 4, 6, 8, 10 and 12 months of storage. Control samples were represented by fresh sweet cherry fruits which were initially characterized when received to the Research Center for Studies of Food Quality and Agricultural Products. After freeze drying, sweet cherries registered weight losses of 84 ± 1% for organic samples and 83 ± 2% for conventional ones. Total phenolic content and antioxidant activity registered stable trends during storage period of freeze dried samples. The obtained results highlight the efficiency of freeze drying process for bioactive compounds storage in sweet cherries.

Key words*: bioactive compounds, conventional, lyophilisation, organic, Prunus avium L.*

COMPARISON OF FRUIT QUALITY ATTRIBUTES OF SOME FIG (*FICUS CARICA* L.) GENOTYPES FROM THE SOUTH-WEST REGION OF ROMANIA

Ana BONA, Sorina POPESCU, Alexandra BECHERESCU, Daniela SCEDEI, Anca DRĂGUNESCU, Ionuț DASCĂLU, Olimpia Alina IORDĂNESCU

Banat University of Agricultural Sciences and Veterinary Medicine "King Mihai I of Romania" from Timisoara, 119 Aradului Street, Timișoara, Romania

Corresponding author emails: anabona604@gmail.com; sorinapopescutm@gmail.com

Abstract

The study aims to make a comparison between fourteen fig genotypes, grown in the South-West region of Romania, that have fruits with different quality traits and to assess which of these genotypes have elevated potential and represent valuable biological material for future propagation. Biometrical variables (weight, length, and width) were measured for the first and the main crop, stalk length and ostiole diameter were also measured. Visual observations were done and the fruits were characterized using the fig characterization given by IPGRI (The International Plant Genetic Resources Institute), 2003. The fruit weight had values between 67 g in SV2 and 11g (S1), the fruit length varied between 5.6 cm (SV2) and 2.6 cm (S1) and the width of the fruits was between 2.81 cm (C1) and 4.68 cm (SV2) genotype. The total soluble solids/TSS (sugar) and the titratable acidity (TA) of the fruits were also assessed, the sugar content recording values of 17.41% Brix for IJ1 genotype and 27.83% Brix for C3 genotype.

Key words*: Ficus carica L., genotype; fruit quality, sugar content, titratable acidity, fruit size.*

CROWN PRINCESS MARGARETA, FALSTAFF AND BROTHER CADFAEL ROSE FLOWERS QUALITY INFLUENCED BY THE ORGANIC PRODUCTION

Ana CORNELIA BUTCARU[1], Mariana DUMBRAVA[2], Florin STĂNICĂ[2]

[1]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: ana.butcaru@qlab.usamv.ro

Abstract

After a comparative study in the organic rose field established at the Faculty of Horticulture in Bucharest, Romania, some physico-chemical parameters of edible rose petal, under the influence of seasons and production year, are presented. Three climbing rose cultivars from David Austin collection, Crown Princess Margareta, Falstaff, and Brother Cadfael were planted in 2015 and an organic technology was used. The average flower weight was higher in June production than that in October in Falstaff and Brother Cadfael but did not differ significantly in Crown Princess Margareta. Mulching systems did not significantly influence the average weight of rose flowers. There were differences between the average flower weight from two consecutive years, green pruning and wool mulching being a possible cause of weight increase. No significant differences between the studied cultivars regarding the petals content in total soluble solids and dry matter were found. Instead, there were differences determined by the harvest period. The petals content of total soluble solids and the dry matter content was higher in the autumn harvest than in the spring.

Key words*: Rosa sp., total soluble solids, dry matter, total acidity.*

STUDY OF SOME STRAWBERRY VARIETIES IN THE ORGANIC SYSTEM IN THE PEDO-CLIMATIC CONDITIONS OF THE VLASIA PLAIN

Cristian CĂLINIŢĂ, Damian DRAGOMIR, Cătălin Viorel OLTENACU

Fruit Research and Development Station Băneasa, 4 Ion Ionescu de la Brad Blvd, District 1, Bucharest, Romania

Corresponding author email: calinita.cristian@scdpbaneasa.ro

Abstract

During 2019-2022 a study on organically grown strawberries (Fragaria x ananassa Duch.) was carried out, in order to find which most suitable variety for Vlasia Plain area is. The crop was established in 2019 in open-field cultivation, with four strawberry cultivars 'Asia', 'Clery', 'Roxana' and 'Thutop', mound cropping system, with 2 rows, mulched with agrotextile and drip irrigation system. The fruits were harvested and the damaged fruits were eliminated and 20 randomly selected marketable fruits were assessed. Fruit weight, diameter and firmness, sugar content and the pH, were measured. Regarding average fruit weight, 'Thutop' had the highest value (19.75 g/fruit), while the lowest 'Clery' (12.43 g/fruit). Regarding sugar content, 'Clery' had average value of 8.8% Brix and the highest firmness of 1.1363 kgf/cm^2. After three years of studies, it can be drawn the conclusion that 'Thutop' recorded the best and most stable results in terms of fruit weight. 'Thutop' has large fruits so it is recommended to be sold as fresh fruit. 'Clery' is recommended for industrialization and obtaining processed products due to the high sugar content.

Key words*: strawberry, organic, cultivars, biometric, preliminary.*

THE PHYSIOLOGICAL PARAMETERS AND QUALITY OF APPLES DURING STORAGE IN CONTROLED ATMOSPHERE CONDITIONS

Ioana Laura CĂTUNEANU[1], Andreea STAN[1], Liliana BĂDULESCU[2], Dorel HOZA[2]

[1]Research Center for Studies of Food Quality and Agricultural Products - University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, 011464, Bucharest, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, 011464, Bucharest, Romania

Corresponding author email: liliana.badulescu@qlab.usamv.ro

Abstract

The aim of this study is to determine the levels of CO2 that preserve better the organoleptic attributes of apples (Malus domestica, Rosaceae family) based on physiological measurements. For 2 years, four apple cultivars (Topaz, Redix, Florina and Rubinola,) were monitored and studied for 350 days. The samples were stored in C.A. conditions with different levels of CO2, in the Research Center for Studies of Food Quality and Agricultural Products, at USAMV Bucharest. Some physiological and biochemical measurements were performed such as: respiration and transpiration rates, maturity index compared with organoleptic attributes. For the first year it was observed a decrease of the transpiration rate between 25% (for Topaz cv.in 5% CO2) and 92% (for Rubinola cv. in 2%CO2), between the initial and final moments. In the second year, after 350 days of storage, the measured transpiration rate increased between 13% (for Rubinola cv.in 2% CO2) up to almost 3 times (for Redix cv. in 0% CO2), between the initial and final moments. Based on the results obtained for the organoleptic attributes, the 2% CO2 content preserved the best quality of all four apple cultivars compared with control (0% CO2), in both years.

Key words*: apple, C.A., respiration rate, sensory analysis, transpiration rate.*

RESPONSE OF SOME APPLE CULTIVARS TO PROHEXADION-Ca COMBINED WITH DIFFERENT FERTILIZATION METHODS IN A SUPERINTENSIVE APPLE ORCHARD

Anca Maria CHIOREAN, Roşu-Mareş SMARANDA

Fruit Research & Development Station Bistrita, 3 Drumul Dumitrei Nou Street, 420127, Bistrița, Romania

Corresponding author email: ancasofron09@gmail.com

Abstract

Supplying the trees with the optimal amounts of nutrients is very important in order to obtain high and quality yields every year. Prohexadione-Ca is a dual-acting substance that is both a growth regulator and an activator of the natural mechanisms of defense of apple trees against the bacterium Erwinia amylovora Different fertilization methods combined with this growth regulator led to a reduction of terminal shoots, increasing of trunk cross sectional area and of yields. The influence of this compound combined with radicular or foliar fertilizers was evaluated in three apple cultivars: Idared, Generos and Florina. In parallel, was tested the efficacy of prohexadione - Ca in prevention of fire blight compared to other products registered in EU for the control of this disease. The results obtained during 2019-2021 revealed benefits of this substance in apple trees technology both in terms of reducing the lenght of terminal shoots and control of Erwinia amylovora.

Key words*: apple, fertilizer, fire blight, growth regulator, terminal shoots.*

THE PHENOLOGY OF SOME NEW ALMOND CULTIVARS TESTED IN NORTHERN DOBROGEA

Lucian CIOACA, Florin STĂNICĂ

University of Agronomic Sciences and Veterinary Medicine of Bucharest,
59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: flstanica@yahoo.co.uk

Abstract

The almond (Prunus dulcis (Miller) D.A. Webb) crop started to regain interest for farmers in Romania. Dobrogea is one of the most suitable regions for almond orchards. The key factor that limits the almond crop in Romania is the early flowering time, flowers and young fruits being suddenly affected by the spring frosts. In this study, the phenology of eight Romanian and foreign almond cultivars grown in a super high-density trial orchard, in Greci, Tulcea County, is presented. The phenology study using BBCH scale was performed in 2021 vegetative season, in order to determine the most suitable late and very late blooming cultivars for Dobrogea region. It resulted that Marinada and Lauranne have a very late blooming time, while the Romanian cultivars Nico and April, have an early – medium blooming time. This study presents original data that could be of interest for scientists but also for farmers whom intend to plant new almond orchards.

Key words*: Prunus dulcis, climate, late blooming, early ripening.*

COMPANION PLANTS FOR RESILIENT ORGANIC RASPBERRY PRODUCTIONS

Roxana CICEOI[1], Ana Cornelia BUTCARU[1], Oana-Crina BUJOR[1], Liliana Aurelia BĂDULESCU[2]

[1]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: ana.butcaru@qlab.usamv.ro

Abstract

Companion plants can support raspberry crops, by attracting bees and other pollinators, by enhancing pest control, including pest trapping, by stimulating soil microbiota and preventing soil-borne fungal diseases. Each category of these services is fulfilled by different plant species, according to their chemical composition, flower morphology, ecological traits. For example, borage (Borago officinalis L.) flowers act as attractants for pollinators, and plant's resistance enhancer, while marigolds can be used to suppress plant-parasitic nematodes. Bush beans, pole beans (Phaseolus vulgaris L.) and other fabaceous improve soil nutrients uptake. Marjoram (Origanum majorana L.), chamomile (Matricaria chamomilla L.), summer savory (Satureja hortensis L.) release volatile organic compounds (VOC's) that encourage faster growth or better taste. Oregano (Origanum vulgare L.) can provide a ground cover that protects the soil from the sun during summer and from the cold during winter. Garlic (Allium sativum L.), leeks (Allium ampeloprasum L.), chive (Allium schoenoprasum L.) and onions act as natural insecticides. The present study gathers the available information on companion plants useful for raspberry crops from the point of view of pest repelling, diseases protection, beneficials sheltering and pollinators attractiveness.

Key words*: trap plants, wild flower strips, cover crops, VOC's, berry growing.*

ALMOND SEED WASP, *EURYTOMA AMYGDALI*, A NEW FRUIT PEST IN THE ROMANIAN FAUNA

Lucian CIOACA[1], Roxana CICEOI[2], Florin STĂNICĂ[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania
[2]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: cioaca_lucian@yahoo.com

Abstract

The almond seed wasp, Eurytoma amygdali Enderlein (Hymenoptera:Eurytomidae) is an important pest for almonds in the European, the Caucasus and the Middle East countries, in some areas the pest's infestation ratio reaching even 95% in the absence of control measures. In Europe, the pest is mentioned so far in Bulgaria, France, Greece, Hungary, North Macedonia, Russia and other territories of the former USSR. In Romania the almond crop has regained interest among farmers, the cultivated area is rising. Almond fruits attacked by Eurytoma spp. larvae have been collected from the spontaneous flora, from the Dobrogea region, raised in laboratory conditions and the morphological characters of three stages of this pest – larvae, pupae and adults have been analysed. Furthermore, the identification by DNA barcode had been initiated. The observations presented confirms the presence in Romanian of E. amygdali, in the Dobrogea region. The paper is of great interest for farmers, pest-control products companies, as well for the research and development of pheromone traps.

Key words*: morphological identification, pest monitoring, DNA identification.*

ROOT SYSTEM ARCHITECTURE IN VÂLCEAN VARIETY (*PRUNUS DOMESTICA* L.) DEPENDING ON ROOTSTOCKS AND TRUNK

Andi CIOBANU[1], Mirela PARASCHIVU[1], Otilia Cotuna[2, 3]

[1]University of Craiova, Faculty of Agronomy, 19 Libertatii Street, Craiova, Romania
[2]Banat University of Agricultural Sciences and Veterinary Medicine "King Mihai I of Romania" from Timisoara, 119 Aradului Street, Timișoara, Romania
[3]Station of Research and Development for Agriculture Lovrin, 200 Principala Street, Lovrin, Romania

Corresponding author emails: paraschivumirela@yahoo.com
otiliacotuna@yahoo.com

Abstract

European plum (Prunus domestica) is one of the fruit tree species cultivated around the world for fresh consumption, prunes (dried fruits), smoked plums, in jams or jellies, juices, plum purée as a baby food, liqueur, distilled into a 'brandy' or spirits, having also a large potential for rural and metropolitan zones landscaping. The experiment was conducted during 2020 year to individual trees in a randomized compete block design in four replicate blocks (10 plum trees/block) within a private plum orchard in the proximity of Craiova city, Dolj county, Romania and included Vâlcean plum variety and four rootstocks (Oteşani 8, Pixy, Miroval, Roşior văratic). The study assessed the architecture of root system, in thickness and variable depths, at 1 and 2 meters away from trunk. For 0-3 mm root thickness category Miroval rootstock has developed the highest roots number (104 roots) at 1m distance from the trunk, while at 2 m trunk distance the best root system development was noticed in Roşior văratic rootstock (58 roots). Among all plum rootstocks included in the experiment Miroval had the most performant root system.

Key words*: architecture, Prunus domestica, rootstock, root, plum variety.*

IMPACT OF FOLIAR FERTILIZATION ON THE QUALITY PARAMETERS OF BLUEBERRY FRUITS

Mihaela CIUCU PARASCHIV[1, 2], Dorel HOZA[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]Research Institute for Fruit Growing Pitești - Maracineni, 402 Marului Street, Maracineni, Arges County, Romania

Corresponding author email: mihaela1mail@yahoo.ca

Abstract

Plant nutrition is one of the determinate factors in fruit production and fruit quality. The aim of the present study is to evaluate some biochemical parameters of blueberry fruits (Vaccinium corymbosum L.), varieties: 'Duke', 'Blueray', 'Hannah's Choice' and 'Elliott' under the influence of foliar organic and conventional fertilizers applied, along with a control treatment without fertilization. The experiment was conducted in the years 2020-2021 in a four-year plantation in the southern region of Romania. Two organic products: Algacifo 3000 (2 L/ha) and ERT 23 Plus (1 L/ha) and one chemical product: Poly-Feed 19–19–19 + ME (10 kg/ha) were used as fertilizer treatments applied to the leaves of the plants. The experimental design was completely randomized according to the indicated treatments with three replicas. Biochemical parameters of the blueberry fruits, like organic acids, total polyphenols content, total dry matter content, total sugar and anthocyanin pigments were analyzed annually. The results indicated that foliar application with organic treatments significantly stimulated the fruit quality.

Key words: *Foliar fertilization, fruit quality, biochemical characteristics, blueberry.*

EFFECTS OF ORGANIC AND INORGANIC FOLIAR FERTILIZERS ON THE NUTRITIONAL AND PRODUCTIVE PARAMETERS OF FOUR HIGHBUSH BLUEBERRIES CULTIVARS

Mihaela CIUCU PARASCHIV[1, 2], Dorel HOZA[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]Research Institute for Fruit Growing Pitești - Maracineni, 402 Marului Street, Maracineni, Arges County Romania

Corresponding author email: mihaela1mail@yahoo.ca

Abstract

To evaluate the effect of some organic or chemical fertilizers on the nutritional and productive parameters of blueberries (Vaccinium corymbosum L.), an experiment was carried out on a farm in the Argeș meadow in a loam-clay soil with four blueberry varieties: 'Duke', 'Blueray', 'Hannah's Choice' and 'Elliott'. Treatments with two foliar organic fertilizers were applied: Algacifo 3000 (2 L/ha) and ERT 23 Plus (1 L/ha) and one conventional treatment: Poly-Feed 19–19–19 + ME (10 kg/ha) along with a control treatment without fertilization in the years 2020-2021 in a four-year blueberry plantation. Results indicate that the nitrogen or phosphorus content of the leaves and fruits was significantly influenced by the variety and fertilization options. The highest concentration of nitrogen and phosphorus in leaves and fruits was recorded in 'Blueray' variety, the variant fertilized with Poly-Feed 19–19–19 + ME. The potassium content showed significant differences between varieties and variants of leaf fertilization. Finally, the chemical fertilizer obtained the highest values for most of the evaluated parameters in all the blueberry varieties studied.

Key words*: blueberry, organic and inorganic fertilizers, plant nutrition, yield.*

EVALUATION OF GENETIC FIDELITY OF *IN VITRO* GROWTH PLANTS OF HIGHBUSH BLUEBERRY (*VACCINIUM CORYMBOSUM* L.) CULTIVARS USING SCoT MOLECULAR MARKERS

Doina CLAPA[1, 2], Monica HÂRŢA[2]

[1]Advanced Horticultural Research Institute of Transylvania, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, 3-5 Mănăştur Street, 400372, Cluj-Napoca, Romania
[2]BIOCERA Research Centre, Faculty of Horticulture, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, 3-5 Mănăştur Street, 400372, Cluj-Napoca, Romania

Corresponding author email: monica.harta@usamvcluj.ro

Abstract

The aim of this research was to investigate the influence of cultivar upon in vitro multiplication rate of highbush blueberry (Vaccinium corymbosum L.) and to evaluate the genetic fidelity of in vitro-propagated plants using molecular markers. Four varieties of blueberries were studied: 'Bluecrop', 'Blueray', 'Brigitta', and 'Duke'. For the in vitro multiplication, the Woody Plant Medium (WPM) basal medium was used, supplemented with 1 mg/L zeatine, 100 mg/L Sequestrene 138 and Plant agar 4 g/L, pH = 5. After ten weeks of in vitro culture, the four highbush blueberry varieties had average proliferation rates between 2.98 ± 0.25 and 9.35 ± 0.50 and the average length of the shoots varied between 2.79 ± 0.15 cm and 3.29 ± 0.13 cm. Clonal fidelity has been checked by twelve Start Codon Target Polymorphism (SCoT) primers. No polymorphism was detected, that proving that the regenerated plants showed high clonal fidelity.

Key words*: clonal fidelity; photosynthetic pigments; polymorphism; shoot proliferation; Start Codon Target Polymorphism.*

CONSIDERATIONS REGARDING THE INFLUENCE OF CLIMATE ON THE PLUM IN THE CULTIVATION CONDITIONS IN ROMANIA

Margareta CORNEANU, Iuliana Elena GOLACHE, Sorina SÎRBU, Elena IUREA, Iulia MINEAȚĂ, Ionel PERJU, Ionuț Vasile UNGUREANU

Research Station for Fruit Growing Iași, 3 Ion Vodă cel Viteaz, Iași, Romania

Corresponding author email: iulianagolache@yahoo.com

Abstract

As result of two years of research this paper presents the phenological and fruit quality parameters of five plums (Prunus domestica L.) cultivars. Observations and determinations were performed in regards to the phenological stages and the physical and chemical traits of the fruit. The climatic differences between the two years of study had an impact on the plum varieties. Temperature was one of the important factors in triggering the phenological stages. The swelling of the buds started with March 07th (`Centenar`) in 2020 and with March 25th (`President`) in 2021. Also, together with the precipitations accumulated in the studied period, significant differences of the characteristics and qualities of the fruits were observed. Fruit weight ranged from 24.23 g to 61.82 g, with higher values obtained by the cultivar `Minerva` in both years. The aim of the research is to suggest the introduction in the culture of some plum varieties with good ecological adaptability to the conditions in NE of Romania and with a good combination of qualitative and quantitative parameters of the fruits.

Key words*: plums, cultivar, climate conditions, phenological stages, fruit quality.*

RESEARCH REGARDING THE IDENTIFICATION OF THE FUNGUS PHOMOPSIS MALI ROBERGE (*PHOMOPSIS* FRUIT TREE CANKER) IN A TWO YEARS OLD ECOLOGICAL APPLE ORCHARD - CASE STUDY

Otilia COTUNA[1], Mirela PARASCHIVU[2], Veronica SĂRĂȚEANU[1], Marinel Nicolae HORABLAGA[1], Andi CIOBANU[2]

[1]Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara, 119 Calea Aradului, Timișoara, Romania
[2]University of Craiova, Faculty of Agronomy, 19 Libertății Street, Craiova, Romania

Corresponding author emails: paraschivumirela@yahoo.com
veronica.sarateanu@gmail.com

Abstract

Phomopsis mali Roberge (Phomopsis fruit tree canker) is a fungus that infects the fruit trees' trunks, branches and sprigs. There were described more than 60 species of Phomopsis. Every of the species is identified in general after the size of the conidia and after the host from which was isolated, the precise identification being sometimes difficult. Phomopsis is a fungus that can produce serious damages in production because it affects the fruitful sprigs. On the other hand, in case of massive attacks it can lead to the fruit trees decline. In the young orchards cultivated in ecologic super-intensive system, the young trees can die in the case of severe infections. The purpose of this research was to identify the Phomopsis fungus in an ecologic super-intensive apple orchard from Arad County (western Romania), in the first two years after the plantation. The biological material used was consisting in six samples sets (sprigs, stems, branches and roots) collected from four apple varieties (Primiera/M9, Crimson Crisp/M9, Golden Orange/M9 and GoldRush/M9). The identification of the disease and of the pathogen was done using visual and laboratory methods. In laboratory was identified the fungus with the humid chamber method and by placement of diseased tissue samples on culture medium followed by incubation at 23 - 24oC for seven days. The branches, sprigs and stems were analysed at stereomicroscope too. Under the cracked bark were identified numerous pycnidia of black colour and pear shaped, specific to the Phomopsis mali fungus. There were noticed young and old fructifications, the old ones were from the previous year or even from the precedent years. The obtained results after the visual analysis of the trees in the orchard and after the laboratory analyses highlighted the presence of the fungus Phomopsis mali. There were highlighted at the microscope the alpha and beta conidia, typical for this fungus. In the orchard all the trees were presenting symptoms specific to the Phomopsis fruit tree canker. The trees covered with numerous canker lesions were died. At the assessment time the dead trees rate on varieties was the following: Primiera – 16.5%; Crimson Crisp – 1.7%; Golden Orange – 16.1%; and Gold Rush – 17.2%. From all the analysed apple varieties only Crimson Crisp had reacted well to the attack of the Phomopsis mali fungus.

Key words*: Phomopsis mali, apple, varieties, pycnidia, Phomopsis fruit tree canker, ecologic orchard.*

PRELIMINARY RESULTS REGARDING THE BEHAVIOR OF SOME CHOKEBERRY CULTIVARS (*ARONIA MELANOCARPA*) IN ORGANIC SYSTEM

Damian DRAGOMIR[1, 2], Mihaela DOGARU[2], Cristian CĂLINIŢĂ[2], Dorel HOZA[1], Florin STĂNICĂ[1,] Adrian George PETICILĂ[1], Ligia ION[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania
[2]Fruit Research and Development Station Băneasa, 4 Ion Ionescu de la Brad Blvd, District 1, Bucharest, Romania

Corresponding author email: dragomir.damian@scdpbaneasa.ro

Abstract

The paper presents partial data related to the evolution of three chokeberry Aronia varieties, grown organically. Aronia melanocarpa, is a crop that is very suitable for organic system, and its fruits have special nutraceutical qualities, containing very high levels of anthocyanins and flavonoids, as well other important substances that can reduce the risk of serious illness. The experiment was performed on plantation established in 2020 in a farm belonging to Fruit Research Station in Ilfov County. The chokeberry cultivars observed were: Melrom, Nero and Galicjanka. Planting distances 1.5 m/3 m, in 2 variants, plants canopy conducted as bush. In 2021, number of shoots and inflorescences per plant, shoots length and the number of fruits per inflorescence were done. Also, fruit weight, size, sugar content, and pH for each cultivar were determined. The observations showed for shoots growth values between 70 - 117 cm with and average number of fruits per inflorescence between 15 and 22. Regarding fruit weight varied between 0.54 and 1.63 grams. The study will continue in order to gather more data for the organic cropping system of Aronia

Key words*: aronia, organic technology, cultivars, canopy, growth dynamic.*

THE EFFECT OF FERTILIZERS ON THE QUALITY OF APPLE FRUITS

Ana Maria DODOCIOIU, Gilda-Diana BUZATU

University of Craiova, Faculty of Horticulture, 13 A.I. Cuza Street, Craiova, Romania

Corresponding author email: diana_buzatu@yahoo.com

Abstract

In the period 2019-2021was followed the effect of different doses of complex fertilizers such as 15:15:15 applied alone and together with some foliar fertilizers such as Pentakeep and Cropmax on the production, quality and accumulation of nutrients in the leaves of the Idared apple variety, cultivated on a faeziom soil from Mehedinti county. The productions were obviously marked by the complex application of the three macroelements, being between 24.69 t/ha and 39.44 t/ha. It was found a clear influence of fertilization on the total dry matter content, which was between 11-17%, the increase being directly proportional to the intake of nutrients from the applied fertilizers. High K concentrations increase their acidity, which results in a change in the ratio of sugar/organic acids and finally a change in taste in the sense of increasing flavor. The nutrients in the leaves have changed favorably as a result of the application of doses and types of fertilizer.

Key words*: fertilizers quality production apple fruits.*

PRELIMINARY RESULTS REGARDING THE BEHAVIOR OF SOME BLACKBERRIES GENOTYPES IN MOARA DOMNEASCĂ (ILFOV COUNTY) AREA CONDITIONS

Mihaela DOGARU, Damian DRAGOMIR, Gherghina DRĂGAN, Maria-Marinela DRAGNEA

Fruit Research and Development Station Băneasa, 4 Ion Ionescu de la Brad Boulevard, District 1, 01381, Bucharest, Romania

Corresponding author email: dogaru.mihaela@scdpbaneasa.ro

Abstract

Blackberries are an important commercial fruit crop, widely grown. The blackberries contain significant amounts of polyphenol antioxidants such as anthocyanin pigments linked to potential health protection against several human diseases, so the demand is increasing. In order to identify the most suitable variety for the Vlasia Plain area, in 2020 an experimental plot with 6 stable accessions was established. The cv. Dar 8, Thorn Free, Chester, Triple Crown, Polar, Navaho, were planted in a plantation scheme 1,0m/3m. For each variety, during 2021 ripened fruits were harvested and biometric determinations have been done in the laboratory, being measured fruit weight and diameter, firmness, titratable acidity and pH, all fruit quality indicators. The preliminary results showed that blackberry varieties without thorns are larger than thorny varieties and more suitable for fresh fruit consumption, while the Dar 8 fruit are not so fragrant, their pulp is stronger, so they are more suitable for processing. The study will continue so statistical analysis can be performed.

Key words*: blackberry cultivation, biometric indicators, preliminary results.*

INFLUENCE OF UNEVENLY SLOPING LAND ON APPLE TREE GROWTH IN ORCHARDS OF THE NORTH EAST ROMANIAN REGION

Feodor FILIPOV, Esmeralda CHIORESCU

"Ion Ionescu de la Brad"University of Life Sciences Iasi, 3 Mihail Sadoveanu Alley, 700490, Iasi, Romania

Corresponding author email: echiorescu@uaiasi.ro

Abstract

Apple is the main species of temperate climate zones that has high ecological plasticity. According to the soil survey guideline, the first land suitability class for apple tree is without slickenside, slope land lower than 25%. Soils for apple plantations must have a medium or coarse texture, must not contain saline or sodium horizons in which the content of soluble salts or exchangeable sodium exceeds tolerable limits, water stagnation and aeration porosity must not fall below 10%. Fine-textured soils in which the clay accumulation horizons are located at a depth of 45-60 cm can be used for apple plantations if the rootstocks are superficially rooted. Following soil survey studies on land with plantations of apple trees with small area of stagnant growth or even dry trees it was found that areas with diminishes slope and with deluvio-colluvial deposits could be a limiting factors of aple tree growth. However, due to the temporary stagnation of water and poor aeration in soils formed on deluvio-colluvial deposits there is a slowdown in the growth rate of trees or even their drying. In our studies, we also noticed that the narrow strips of soil on deluvio-colluvial deposits are the so-called hot-spots where the accumulation of substances used for the protection of trees against pathogens sometimes takes place

Key words*: slope land, waterloging, apple tree.*

RESULTS REGARDING THE EFFICACY OF SOME FUNGICIDES IN CONTROLLING *VENTURIA INAEQUALIS* IN MĂRĂCINENI AREA IN 2016

Nicolae GHEORGHIU[1], Laurențiu BĂLONIU[2]

[1]University of Craiova, Horticulture Faculty, Department of Horticulture & Food Science, 13 A.I. Cuza Street, Craiova, Romania
[2]Bayer S.R.L., Craiova, Romania

Corresponding author email: nicolae.gheorghiu76@gmail.com

Abstract

This paper presents the results recorded following the application in apple culture of different treatment programs with fungicide in order to control Venturia inaequalis, a pathogen recognized for the quantitative and qualitative damages caused. In order to control this pathogen, the chemical measures are necessary in addition to the agro-phytotechnical ones. The efficacy of the new active substance fluopyram, present in Luna Experience, with effect in blocking the pathogen's respiration. The apple variety on which the experiments were carried out is Idared, chosen especially for its sensitivity to the apple scab. The observations took place in 2016 at I.C.D.P. Mărăcineni. The evolution of the meteorological parameters was noted using Watchdog station, the dedicated software and IRFAN VIEW (Freeware). With its help, the dynamics of the infections were graphically highlighted and warnings were elaborated. In the field, observations were made to determine the frequency (F%) and intensity (I%) of the attack, in order to calculate the degree attack (DA%). In the end, the effectiveness of the treatment programs was calculated.

Key words*: fungicide, apple scab, treatments, efficacy, results.*

RESULTS REGARDING THE EFFICACY OF SOME INSECTICIDES IN CONTROLLING *PHYLLONORYCTER BLANCARDELLA* IN APPLE CULTURE IN MĂRĂCINENI AREA IN 2016

Nicolae GHEORGHIU[1], Laurențiu BĂLONIU[2]

[1]University of Craiova, Horticulture Faculty, Department of Horticulture & Food Science, 13 A.I. Cuza Street, Craiova, Romania
[2]Bayer S.R.L., Craiova, Romania

Corresponding author email: nicolae.gheorghiu76@gmail.com

Abstract

This paper highlights the results obtained following the application of different treatments to control Phyllonorycter blancardella. The weather parameters values were correlated with the attack dynamics, establishing precisely both the moments of maximum vulnerability and insecticide application, for the highest possible effectiveness. Data were collected using the Watchdog station and also AtraBlanc-type pheromone traps were used in the field to monitor the adult's flight. In order to analyze the effectiveness, two treatment schemes were proposed, one of which included the active substance spirotetramate (V_2). In the case of the three generations (G_1-G_3) of pest larvae, the calculated efficacy of the two treatment variants recorded the following values: for G_1 the efficacy was 79.41% (V_1) and 98.52% for V_2 variant; for G_2 generation the efficiency was 78.38% for V_1 and 97.3% for V_2, and for G_3 generation, the V_1 efficiency was 76.92%, and in the variant where spirotetramate was applied at three different times the efficiency increased to 97.43%.

Key words*: insecticide, spotted teniform leafminer, treatments.*

THE EVIDENCE OF THE PRESENCE OF APPLE SCAB RESISTANCE *VF* GENE OF SOME LOCAL APPLE CULTIVARS FROM TRANSYLVANIA

Georgeta Maria GUZU[1, 2], Ioan ZAGRAI[1], Luminița Antonela ZAGRAI[1], Claudiu MOLDOVAN[1], Mirela Irina CORDEA[2*]

[1]Fruit Research & Development Station Bistrita**,** 3 Drumul Dumitrei Nou Street, 420127, Bistrița, Romania
[2]University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Faculty of Horticulture, 3-5 Mănăştur Street, 400372, Cluj-Napoca, Romania

Corresponding author email: mcordea@usamvcluj.ro

Abstract

Apple is one of the most important crops in temperate areas, and it is situated on the second place, after plum, in Romania. The scab caused by Venturia inaequalis is a widespread disease in apple crop, which produces considerable economic losses. The aim of the study was to identify the presence of the Vf gene in four local apple cultivars ('Goldprim', 'Dany', 'Doina' and 'Alex'), obtained by the FRDS Bistrita. The investigated cultivars are known to be resistant to scab, but their selection was made by classical methods which do not guarantee the presence of Vf gene. To get an accurate confirmation of the Vf resistance mechanism in the genome of the cultivars, a molecular tool was used. Thus, the mentioned apple cultivars were tested by using the Marker Assisted Selection (MAS) method, with three pairs of specific markers: AL07, which allows the producing two bands corresponding to Vf-dominant, and vf-recessive respectively; the other two markers are AM19 and $U1_{400}$ as dominants (Vf). According to the results obtained, the Vf resistance genes were identified as heterozygous (Vfvf) in all four local apple cultivars tested.

Key words*: apple, disease, molecular marker, scab, Vf gene.*

RESEARCH REGARDING THE RESPONSE OF SOME BLUEBERRY VARIETIES IN GARDITSA AREA, GREECE

Dorel HOZA[1], Ioannis KOTROTSIOS[2], Ligia ION[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania
[2]Agricultural Direction, Karditsa, Greece

Corresponding author email: dorel.hoza@gmail.com

Abstract

Blueberry culture has become more attractive to many pomiculturists due to the special quality of fruits and of their nutritive and nutraceutical value. The comparative research of 4 blueberry culture varieties: Duke, Draper, Patriot and Brigitta and 2 pruning variants proved different responses in similar culture conditions. The biological characteristics of the varieties selected manifested through different capacity of producing shoots in the collet area, through different reaction to pruning and through the capacity of forming inflorescences. Pruning influenced the growth in height of plants, the ramification capacity of the bush and the size of the fruits. Heavy pruning determined a bigger growth, larger fruits and eventually a higher capacity of production. From the studied varieties Duke was the earliest one but with a small production capacity, Brigitta was late and the most productive and Draper and Patriot registered mediate values.

Key words*: growth, fructification, pruning.*

CORRELATION AND REGRESSION DEPENDENCES BETWEEN VEGETATIVE AND REPRODUCTIVE INDICATORS IN TEGERA AND ELENA CULTIVARS (*PRUNUS DOMESTICA* L.) AS A RESULT OF DIFFERENT AGROTECHNICAL SISTEMS

Denitsa HRISTOVA, Diyan GEORGIEV

Agricultural Academy, Research Institute of Mountain Stockbreeding and Agriculture, 281 Vasil Levski Str., Troyan, Bulgaria

Corresponding author email: den_1986@abv.bg

Abstract

During the period 2016-2018 at the Research Institute of Mountain Stockbreeding and Agriculture in Troyan a study was conducted to analyze different agrotechnical systems (organic and conventional fertilizing technology) in plum plantations. As a result of the fertilization, the vegetative and reproductive manifestations of plum cultivars with different ripening periods (Tegera and Elena) were monitored. Correlation and regression analysis established the relationship between the studied indicators. Depending on the applied system, genotypic similarity but also cultivar difference was analyzed. The biological fertilization of the Tegera cultivar determines a positive correlation between the average fruit weight and the average yield kg/tree at a correlation coefficient (r = 1.000) and regression equation y = 11.422 x - 341.62 with a coefficient of determination R^2 = 1.0. In contrast to organic production, in the conventional technology in both cultivars a correlation was found between the average mass of the stone and the average yield kg/tree; (Tegera r = 0.866; Elena r = 0.714), with a coefficient of determination (Tegera R^2 = 0.750; Elena R^2 = 0.510).

Key words*: Prunus domestica L., fertilizers, vegetative and reproductive indicators, correlation and regression dependences.*

CAN KIWIFRUIT GROW IN ROMANIA? RESULTS OF THE ROMANIAN BREEDING PROGRAM AFTER 25 YEARS OF RESEARCH ON *ACTINIDIA* SPP.

Lavinia-Mihaela ILIESCU[1], Giuseppe ZUCCHERELLI[2], Adrian George PETICILĂ[1], Florin STĂNICĂ[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, Bucharest, Romania
[2]Vitroplant, Via Loreto 170, Cesena, Italy

Corresponding author email: iliescu_lavinia@yahoo.com

Abstract

In Romania, kiwi is a new fruit specie and the creation, testing and introduction of winter hardy genotypes, adapted to the local harsh climate conditions represent a priority. The first kiwifruit orchards with Actinidia deliciosa and A. arguta were planted in Romania in 1993, at Ostrov (Constanța County), on the border of the Danube River. In the same year, a common Italian-Romanian kiwifruit breeding program was initiated at the Faculty of Horticulture within the University of Agronomic Sciences and Veterinary Medicine of Bucharest. Since 1993, research has been carried out to determine the best methods of propagation, growing and kiwifruit orchard management. Genotypes phenology was studied every year in comparison with the climatic data. In parallel, physical and biochemical fruit characteristics were evaluated after ripening and during the storage. After some years of observations and tests, three kiwiberry selections were registered: 'Vip Green' (R8P23), 'Vip Red' (R8P20) and 'Green Delight' (R8P1). Other intra and interspecific crossings using A. deliciosa and A. chinensis were made and from the initial hybrids, some selected genotypes as R0P13, R1P9, R1P8 and R1P12, have good fruit characteristics and yield. The new selections have to be registered as cultivars and can be successfully cultivated on commercial orchards and in private gardens. This paper presents few results of the Actinidia spp. Romanian breeding program. Some fruit quality characteristics of the new kiwi selections and hybrids as average weight, fruit shape index, pulp firmness, soluble solids, dry matter, acidity and ascorbic acid are detailed. After more than two decades of research, it was demonstrated that Actinidia deliciosa and A. chinensis can be grown in Romania in peach favourable areas, while A. arguta (kiwiberry or baby kiwi) can cover larger areas, suitable for plum cultivation.

Key words*: Actinidia arguta, Actinidia deliciosa, Actinidia chinensis, selection, fruit characteristics.*

PCR REACTION OPTIMIZATION FOR RAPD ANALYSIS OF SWEET CHERRY (*PRUNUS AVIUM L.*)

Maria-Cristina IONESCU [1], Liliana BĂDULESCU[1], Mihaela IORDĂCHESCU[2]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: mihaela.iordachescu@qlab.usamv.ro

Abstract

Prunus avium L. is a fruit trees species belonging to the Rosaceae family, cultivated worldwide in temperate climates. This study presents the optimisation of RAPD method using as template DNA the genomic DNA extracted from 'Rivan' sweet cherry variety. The parameters optimized were genomic DNA concentration and primer concentration. Prior to optimisation of these parameters, the optimum annealing temperature for the primer used in the PCR reaction was determined to be 30°C. The concentration of genomic DNA in the RAPD reaction varied between 0.05 ng/µl and 1.00 ng/µl, and that of the primer varied between 0.1 µM and 2.0 µM. The optimum concentration for the genomic DNA proved to be 0.5 ng/µl and that of the primer 2.0 µM. The results of this study will be applied in a future experiment, the study of genetic variability of Romanian sweet cherry varieties present in the orchard collection of USAMV Bucharest.

Key words*: DNA amplification, polymerase chain reaction, random amplification of polymorphic DNA.*

RAPD, ISSR AND SSR MOLECULAR MARKERS - APPLICATIONS IN *VACCINIUM* SPP.

Mihaela IORDĂCHESCU[1], Adrian ASĂNICĂ[2], Cosmin Alexandru MIHAI[2]

[1]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: cosmin.mihai@horticultura-bucuresti.ro

Abstract

The consumption of berries on a global level, either from wild or cultivated species, is on an ascending trend, being linked to the high nutraceutical qualities of the fruits. Therefore, the demand to create new varieties adapted to the various environmental conditions worldwide is becoming higher. In order to reduce the time needed to obtain new varieties, plant breeders have started to use more and more molecular methods and techniques. Molecular markers, such as RAPD, ISSR and SSR, specific DNA regions linked to genes responsible for various traits such as color, shape, taste, firmness, tolerance to biotic and abiotic stresses are some of the molecular tools considered in genotype-assisted breeding programs. The current review presents data related to the use of RAPD, ISSR and SSR molecular markers in Vaccinium species.

Key words*: Vaccinium corymbosum, Vaccinium myrtillus, Vaccinium vitis-idaea, Vaccinium ashei, Vaccinium angustifolium, genetic diversity, breeding.*

DIFFERENCES IN TEXTURAL PARAMETERS OF SOME APPLE CULTIVARS CULTIVATED IN THE EXPERIMENTAL FIELD OF USAMV BUCHAREST

Ionut ISTRATE[1], Roxana MIHALACHE[1], Antonia MOSTEANU[1], Adrian ASĂNICĂ[1], Ana BUTCARU[2], Liliana TUDOREANU[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: istrateionut912@yahoo.com

Abstract

Apple cultivars' textural properties are important quality parameters and have a strong influence on consumers acceptability of fresh fruits. Pedo-climatic condition, treatments and fertilisation are strongly influencing fruit quality therefore the present study presents a comparison of textural parameters (cohesiveness, hardness, chewiness and stiffness), measured using textural profile analysis (TPA) for several apple cultivars (Rubinola, Jonafree, Dalinbel and Red Elstar) stored in the cold storing chamber (1 C, 85-90%RH) for 30 days and 75 days. The samples for the TPA analysis were collected radially, from the hypanthium of each apple (no skin). The Jonafree cultivar was the only one which showed no significant changes of cohesiveness after 30 and 75 days of storage. After 30 days of cold storage Dalinbel and Rubinola cultivars showed no significant difference in hardness, however they were significantly different after 75 days. The study revealed that textural properties may be not significantly different between some apple cultivars up to 30 days of cold storage however all tested parameters are significantly different after 75 days, confirming different physiological response after 30 days of cold storage.

Key words*: textural properties, Rubinola, Jonafree, Dalinbel, Red Elstar.*

GENETIC RESOURCES OF SOUR AND BITTER CHERRY IN THE SPONTANEOUS AND CULTIVATED FLORA FROM NORTHEAST AREA OF ROMANIA

Elena IUREA, Sorina SÎRBU, Margareta CORNEANU, Iuliana Elena GOLACHE, Iulia MINEAȚĂ

Research Station for Fruit Growing Iasi, 3 Ion Vodă cel Viteaz Street, Miroslava, Iași County, Romania

Corresponding author email: sorinas66@yahoo.com

Abstract

The aim of the paper is to describe the valuable traits of bitter and sour cherry genotypes selected from the spontaneous and cultivated flora (in the Moldova region), approved as new cultivars between 1990-2016. That improve the domestic assortment of sour and bitter cherry with new cultivars that shows resistance to disease and frost, have qualitative fruits, adapted to the particular conditions of the Northeastern region of Romania. In terms of the weight of the fruits (g) cultivars that were highlighted are the cherry cultivar 'Amaris' (5.5 g) with very significant positive differences and the sour cherry cultivar 'De Botoşani' (6.0 g) with significant positive differences in comparison with the control (4.2 g for bitter and 5.7 g for sour cherry). In terms of stone size, the values for the cherry cultivars were between 0.25-0.33 g, while the values for the sour cherry cultivars were between 0.30-0.34 g, being classified as small to middle size according to the UPOV guideline. The studied bitter and sour cherry cultivars present good resistance to fruit cracking with 0.0-3.7% cracked fruits.

Key words*: fruit, biometry, size, traits.*

THE OCCURRENCE OF FUNGAL STORAGE PATHOGENS ON POME FRUITS

Elena Stefania IVAN[1], Roxana CICEOI[1], Anca Amalia UDRIŞTE[1], Beatrice IACOMI[2]

[1]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: roxana.ciceoi@qlab.usamv.ro

Abstract

One of the challenges for pome fruit producers are facing is the loss caused by the fungal storage pathogens. Even though infections are taking place in the field, the symptoms are apparent only during the storage period, leading to problems in marketing and trading. In the present study, for the assessment of the incidence of postharvest pathogens in Romania, for the period 2019- 2021, fruits with visible symptoms were sampled from storage facilities in five counties, at different periods. Pathogens causing rot symptoms were isolated and identified. On apples sampled in Romania in 2019, four different species of Penicillium, Botrytis spp. Stemphylium spp., Fusarium spp., Alternaria spp., Monilinia fructigena, Gloeosporium spp., N. vagabunda and Trichoderma harzianum were found. The fungus identity was confirmed by DNA barcoding using ITS1 - ITS4 primers and blast in BOLD systems, GenBank (NCBI) and EPPO Q-bank. The same protocol was used to confirm three isolates of M. fructigena, one isolate of N. vagabunda and one of T. harzianum. In 2020, Penicillium spp., Botrytis spp., M. fructigena, N. vagabunda and T. harzianum were identified. On apples sampled in 2021, six isolates of Penicillium spp., Botrytis spp., Monilinia spp. and Trichoderma harzianum were detected.

Key words*: storage pathogens, apple, Monilinia spp, Neofabraea spp., DNA barcoding.*

FUNGAL ENDOPHYTIC COMMUNITY ASSOCIATED WITH PEAR TWIGS AND BUDS

Carmen Palmira IONESCU[1], Ana BUTCARU[2], Fulvia-Florica VLAD[1], Beatrice Michaela IACOMI[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania
[2]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author emails: ana.butcaru@qlab.usamv.ro, b.iacomi@yahoo.fr

Abstract

This study presents the first screening of the fungal endophytic community associated with pear twigs and buds. Experiments were conducted on collected biological material from the Romanian resistant-disease pear collection, on March 2021. Corina, Cristal, Euras, Orizont, Romcor and Tudor were some of the pear cultivars analysed. Endophytic fungal community in twigs was represented by Alternaria (35%), Aureobasidium (25%), Cladosporium (16%), Penicillium (5%), Fusarium (4%), Sordaria (4%), Nigrospora (3%), Trichoderma (3%) and Botrytis (0.6%) isolates. Isolates belonging to Alternaria (56%), Aureobasidium (47%), Cladosporium (15%), Fusarium (5%), Trichoderma (4%), Epicoccum (3%), Penicillium (2%) and Nigrospora (2%) genera were detected and identified in buds. Our results highlight the presence of isolates belonging to genera Aureobasidium, Epicoccum, Sordaria, and Trichoderma, which have been described as having antagonistic properties and/or potential to promote plant growth. Screening of antagonistic properties of some selected isolates is currently underway. A better understanding of these endophytic communities in a complex network can bring information on their roles, on their interactions with pear trees and with pathogens, and their mechanism of action.

Key words*: fungal endophytes, pear trees, twigs and buds.*

GENETIC RELATIONSHIPS BETWEEN SEVERAL ROMANIAN PLUM VARIETIES USING RAPD MOLECULAR MARKERS

Mihaela IORDĂCHESCU[1], Liliana BADULESCU[2], Adrian ASĂNICĂ[2], Anca Amalia UDRIŞTE[1]

[1]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: amalia.udriste@qlab.usamv.ro

Abstract

Plum (Prunus domestica L.) is the dominant fruit tree species in Romania and has an ancient tradition in growing all over the country. The assortment of the plum varieties has seen a continuous increase in time, enhancing the genetic variability. In the current work, RAPD analysis was carried out to assess the genetic relationships between seven Romanian plum varieties ('Brumării de Voinești', Record', 'Gemenea', 'Elena', 'Centenar', 'Silvia', și 'Pescăruș') existent in the germplasm collection of the Faculty of Horticulture, USAMV Bucharest, Romania. Five random decamer primers identified 28 polymorphic and 11 monomorphic RAPD loci. The constructed UPGMA dendrogram associated the cultivars studied into 2 clusters, one cluster with the varieties 'Record' and 'Gemenea', and another cluster grouping the rest of the varieties. The genetic fingerprints obtained following amplification with the RAPD markers, are specific for each variety, and may be used for molecular identification of the varieties in the germplasm collection.

Key words*: European plum, genetic variability, plum breeding, plum germplasm, genetic fingerprint.*

RESEARCH ON EFFECTIVENESS OF SULPHUR BASED - ON FUNGICIDES TREATMENTS AGAINST *PODOSPHAERA LEUCOTRICHA* IN APPLE IN VOINESTI AREA, DAMBOVITA COUNTY

Daniel JALOBĂ[1, 2], Stelica CRISTEA[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest,
59 Mărăşti Blvd, District 1, Bucharest, Romania
[2]Research-Development Institute for Plant Protection Bucharest,
8 Ion Ionescu de la Brad Blvd, District 1, Bucharest, Romania

Corresponding author email: daniel.jaloba@gmail.com

Abstract

Apple powdery mildew caused by Podosphaera leucotricha is one of the most common and severe diseases of this plant in all production areas. In years under favorable conditions for the disease, especially for susceptible varieties, it causes significant damage to apple orchards of up to 80% of the harvest. The research was carried out between 2019 and 2021 within the Research and Development Station for Fuit Growing Voinești and aimed at the effect of Polisulf product type MIF and Sulfomat 80 PU on the attack of the monitored pathogen on Jonathan and Golden Delicious varieties. The highest degree of attack was calculated for the Jonathan variety of 60.8% in 2021. The effectiveness of the treatments was 80.5% - 84.8% for the Jonathan variety and 88.2% - 96.4% for the Golden Delicious variety. Sulfur-based products have provided good protection against powdery mildew and are recommended in integrated apple protection systems.

Key words*: apple orchard, degree of attack, effectiveness, powdery mildew, sulphur based - on product.*

PRELIMINARY RESULTS ON EARLY CROP LOAD AND GROWTH RESPONSES OF 'LAPINS' SWEET CHERRY CULTIVAR (*PRUNUS AVIUM* L.) GRAFTED ON 'GISELA 5' AND 'GISELA 6' ROOTSTOCKS IN A DRIP IRRIGATED FIELD TRIAL

Zsolt JAKAB-ILYEFALVI, Anca SOFRON

Fruit Research & Development Station Bistrita, 3 Drumul Dumitrei Nou, Bistrita, Romania

Corresponding author email: zsolt.jakab@yahoo.com

Abstract

The growth responses of 'Lapins' sweet cherry cultivar (Prunus avium, L.) grafted on 'Gisela 5' and 'Gisela 6' rootstocks was evaluated in drip irrigation conditions in Bistrita Fruit Region, in Northern Transylvania Romania, during 2020-2021, in a high density field trial, trees were trained as spindle bush with 1250 trees/ha density. During the study the following parameters were evaluated, trunk cross section area, volume of the tree crown, leaf area, length of shoots, number of shoots, height of trees, leaf area/fruit, crop load, yield, fruit number/tree, average fruit size and main quality characteristics of the fruits. Preliminary data showed that trees grafted on 'Gisela 6' when compared with 'Gisela 5' proved to be more vigoruous when considering trunk cross sectional area and canopy volume indicators. Data showed that generally in both rootstock combinations a high fruit number per tree was observed at 'Lapins' cultivar and fruit size was largely a function of crop load and leaf area:fruit ratio. In order to obtain a good fruit size most probably, crop load of self fertile 'Lapins' cherries on Gisela rootstocks must be regulated by different pruning treatments. Drip irrigation had a crucial influence on the vegetative development of the trees and completed the physiological need of plants maily in critical summer drought periods.

Key words*: rootstock, TCSA, canopy volume, irrigation.*

STUDY OF THE PRODUCTION OF SOME STONE FRUITS IN THE COUNTRIES ON THE BALKAN PENINSULA THROUGH MATHEMATICAL APPROACHES

Neli KERANOVA

Agricultural University-Plovdiv, Faculty of Economics,
12 Mendeleev Blvd, 4000, Plovdiv, Bulgaria

Corresponding author email: nelikeranova@abv.bg

Abstract

This is a study of the yields of stone fruits (apricots, cherries, peaches, nectarines and plums) on the territory of the Balkan countries for the period 2000-2016. A comparative assessment of the countries according to this indicator was made. Hierarchical cluster analysis and single factor analysis of variance were applied. For the period under study, the highest yield of apricots, cherries and plums is in Slovenia (157293.82 hg/ha, 313841.82 hg/ha and 1580446.53 hg /ha respectively). Greece (185991.47 hg/ha) and Italy (183474.12 hg/ha) have the highest yields of peaches and nectarines. The lowest yields of apricots are proven in Croatia (17966.59 hg/ha), followed by Bosnia and Herzegovina (21697.47 hg/ha). Bosnia and Herzegovina also has the lowest yields of cherries, peaches and nectarines (45717.29 hg/ha and 19491.18 hg/ha respectively). Slovenia has the highest proven instability of the yields of all crops. They are the most stable in Bosnia and Herzegovina.

Key words*: fruits, Balkan countries, cluster analysis.*

PECULIARITIES IN THE INITIAL STAGES OF DEVELOPMENT IN SOME STONE ORCHARDS, DEPENDING ON THE TEMPERATURE CONDITIONS

Petya MALASHEVA

National Institute of Meteorology and Hidrology,
Tsarigradsko shosse 66, Sofia, Bulgaria

Corresponding author email: Petia.Sredkova@meteo.bg

Abstract

The last decade has been characterized by an increased frequency of climatic anomalies and their amplitude. These anomalies affect productivity, which is directly dependent on agro-meteorological conditions. The registered tendencies of change of the hydrothermal conditions are in the different regions of the country are the risk factor for their productivity especially in the initial phenological stages of the development of the fruit trees. The aim of this study is to make assessment of the thermal conditions in the initial stages of development of some stone fruit crops grown in Bulgaria. There were analyzed the conditions during the forced dormancy in the orchards and the steady transition of the average daily temperature above 5°C, as well as the appearance of late frost in the spring in order to determine the risk of damage were assessed.

Key words*: phenology, temperature conditions, orchards, forced dormancy.*

EDIBLE CLIMBING ROSE DISEASES MANAGEMENT IN THE ORGANIC SYSTEM

Alexandra Maria MARIN[1], Ana Cornelia BUTCARU[2], Beatrice IACOMI[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: anabutcaru@gmail.com

Abstract

This study presents the results of the management program applied to the climbing edible rose crop between the 2020 and 2021 periods and its influence on the main pathogens. The research was carried out on the Experimental Field of Faculty of Horticulture within USAMV Bucharest established in 2015 with an organic edible rose plantation with three climbing cultivars from the David Austin Collection: Crown Princess Margareta, Falstaff, and Brother Cadfael. The management strategy included identification, monitoring, and observing the main pathogens, powdery mildew (Sphaerotheca pannosa var. rosae) and blackspot (Diplocarpon rosae). At the same time, elaboration and personalize specific pest control and fertilization schemes to prevent or limit the pathogen attack and increase the plant immunity. Both black spot and powdery mildew were present with a very low degree of attack (below 1%), their presence being prevented and limited by the application of the elements of technology and the protection scheme. Interesting determination highlighted the influence of cultivar and its position in the field on disease occurrence.

Key words*: powdery mildew (Sphaerotheca pannosa var. rosae), blackspot (Diplocarpon rosae). Falstaff, Crown Princess Margareta, Brother Cadfael.*

BEHAVIOR IN THE NURSERY OF ROOTSTOCKS FOR PEACH-NECTARINE, APRICOT AND ALMOND SPECIES AND THE STUDY OF THE VARIETY-ROOTSTOCK INTERACTION

Craisor MAZILU, Silvia NICOLAE

Research Institute for Fruit Growing Pitești - Maracineni, 402 Marului Street, Maracineni, Arges County, Romania

Corresponding author email: mazilucraisor@yahoo.com

Abstract

The researches aimed at the behavior of rootstocks and perspective selections, in the species peach-nectarine (Adaptabil, B83 / 8), apricot (Apricor, Baroc, RoP8803001, RoP8802011) and almond (Miroper, Aidared) in nursery fields. For the variety-rootstock interaction (second field), fifteen varieties or perspective selections for all species were studied. The indicators followed were the production of unrooted cuttings/ha (mother plantation for cuttings), the rooting capacity of cuttings (softwood cuttings), planting attachment (first field) and the variety - rootstock interaction (second field). Following the research in the mother plantation of cuttings, the production of unrooted cuttings/ha varied depending on the year and the planting distance, but also on the rootstock. The percentage of rooting by softwood cuttings is generally higher in the variants in which the rooting stimulator was used. In the first field of the nursery the planting attachment for all rootstocks was higher than 91.10%. In the second field the rootstock influences differently the height, the surface of the trunk section of the trees and the capacity to emit anticipated shoots depending on the combination of the rootstock with grafted variety.

Key words*: rootstocks, softwood cuttings, variety, nursery.*

THE DIVERSITY OF SOME PHENOLOGICAL FEATURES IN BLUEBERRY CULTIVARS (*VACCINIUM CORYMBOSUM* L.) GROWN IN BANAT AREA, ROMANIA

Maria-Marina MERCA (LAIES)[1], Sina Niculina COSMULESCU[2]

[1]University of Craiova, Faculty of Horticulture,
Doctoral School of Plant and Animal Resources Engineering,
13 A.I. Cuza Street, 200585, Craiova, Romania
[2]University of Craiova, Faculty of Horticulture, Department of Horticulture and Food Science, 13 A.I. Cuza Street, 200585 Craiova, Romania

Corresponding author emails: maria_laies@yahoo.com, sinacosmulescu@hotmail.com

Abstract

This paper's aim was to investigate the adaptation to the environmental conditions of south-western Romania, Banat region (45°25'48"N 21°34'55"E) in terms of flowering and ripening seasons, of 3 commercial blueberry (V. corymbosum) cultivars of North American origin in order to examine and determine the levels of genetic difference. This study was carried out during the growing season in a blueberry plantation, for 'Duke', 'Hannah's Choice' and 'Elliott' varieties. In the study, phenological traits were recorded using the BBCH phenological scale for blueberry and the observation of phenotypic data was recorded as the number of days from January 1st for statistical analyses. Cultivars were found to have quite different characteristics in terms of phenological traits. The highest coefficient of variation belonged to early pink bud (57 BBCH) (CV = 14.08%), while the lowest CV was given by bud break (53 BBCH) (CV = 5.70%). It was found that the differences in phenology recorded between cultivars are due to the different accumulation of the amount of temperature required for the development of a certain phenophase, depending on the cultivar's requirements, knowing that the temperature factor is crucial for exiting from dormancy, flowering and fruit ripening.

Key words: *blueberry, diversity, phenology.*

MORPHO-PRODUCTIVE CHARACTERISTICS OF "SWEET" SERIES CHERRY CULTIVARS GRAFTED ON TWO ROOTSTOCKS

Alexandru MIHĂESCU, Forin BACIU, Lavinia Mihaela ILIESCU, Adrian ASĂNICĂ, Florin STĂNICĂ

University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: iliescu_lavinia@yahoo.com

Abstract

In order to achieve the highest return of investment, starting a new orchard must take in considerations many aspects, including the recent market trends. The choose of the right planting material (cultivar/rootstock) and of the right canopy and planting distances are essential to get a good return of the invested resources. Sweet cherry (Prunus avium L.) is already a requested species fruit for the Romanian farmers, but continuously improvements are needed in order to satisfy the demand and keep up with the market trends. Harvesting premium quality fruit in the current climatic context is no easy task, so research should be conducted on local experimental fields, in order to study the performance of the new released cultivars. The paper presents the morpho-productive characteristics of five "Sweet" cherry cultivars, bred at Bologna University and grafted on two rootstocks: GiSelA5 and GiSelA6. Kordia and Regina were planted used as control. The experimental field was established at the Faculty of Horticulture within the University of Agronomic Sciences and Veterinary Medicine of Bucharest. The planting distances varied with the canopy and rootstock from 4.0 m x 1.5 m for Bi Baum® and GiSelA5 to 4.0 m x 2.0 m for Trident and GiSelA6, respectively. Few tree vegetative characteristics as height, axes balance, canopy volume, annual growth, etc. are reported. Yield and some few productivity indexes were calculated and the results showed an important influence of cultivar, rootstock and canopy.

Key words*: Prunus avium, vigor, TCS, yield, productivity.*

GRAFTING METHODS FOR *DIOSPYROS VIRGINIANA* L. AND *DIOSPYROS KAKI* THUNB. HYBRIDS PROPAGATION

Cosmin Alexandru MIHAI[1], Ana Cornelia BUTCARU[2], Florin STĂNICĂ[1], Lavinia Mihaela ILIESCU[1, 2]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: anabutcaru@gmail.com

Abstract

Grafting is the most common propagation method for cultivars and valuable hybrids of persimmon. Top grafting or chip budding, in summer or wintertime, grafting remains the most convenient propagation method for cultivated species of the Diospyros genus. This paper aims to present the result of the influence of two grafting methods applied on five selections of Diospyros virginiana from Jerry Lehman selections and three selections of Diospyros kaki, one from Romania and two from Italy. For both species, generative rootstocks of Diospyros virginiana were used. The bark graft method and a traditional Chinese method of oblique cleft grafting were applied. Different biometric parameters were influenced by the grafting method for both species. The grafting rate was over 99% for both methods. The results showed that the oblique cleft Chinese method was the most expeditious grafting method.

Key words: *breeding, American persimmon, Oriental persimmon.*

GENETIC RESOURCES OF *PRUNUS* SUBGENUS *CERASUS* (GRAY) IN THE TROYAN REGION, BULGARIA

Teodora MIHOVA, **Petko MINKOV,**

Research Institute of Mountain Stockbreeding and Agriculture,
Agricultural Academy, 281 V. Levsky Str., 5600, Troyan, Bulgaria

Corresponding author email: teodora.mihova@gmail.com

Abstract

Local plant genetic resources of Prunus sp. in the Forebalkans region of the Troyan municipality. The present study was conducted during the spring-summer period of 2019-2020. A number of expeditionary studies were conducted to search for local genotypes and varieties of the genus Prunus subgenus Cerasus (Gray) in the Forebalkans region. Three local genotypes were selected and described in the present study, and the Oblachinska variety was accepted as a standard. Their main morphological characteristics have been studied: height, diameter, stem length, color, biochemical analysis, the taste of the fruits. Their main morphological characteristics have been studied: height, diameter, stem length, color, biochemical analysis, of the fruit taste. Cherry SCHT has a higher dry matter content of 16.50% and total sugars of 4.70%. Larger amounts of tannins contain the fruits of the SCHB 0.104%. The highest content of total polyphenols was obtained at cherry SCHT 163.14 mg/g. Anthocyanins have a higher content in cherries SCHB 41.94 mg%. All three local genotypes are suitable for fresh consumption and processing

Key words: *Prunus subgenus Cerasus (Gray), sour cheries, genetic resources, biochaemical compounds.*

BEHAVIOUR OF SOUR CHERRY CULTIVARS TO THE CAUSES OF CYLINDROSPORIOSIS AND SHOT HOLE DISEASE

Petko MINKOV, Boryana STEFANOVA, Georgi POPSKI, Silvena TODOROVA

Agricultural Academy, Institute of Mountain Stockbreeding and Agriculture, 281 Vasil Levski str., 5600, Troyan, Bulgaria

Corresponding author email: stefanova_b@abv.bg

Abstract

The study was conducted in the period 2018-2020 on the territory of RIMSA Troyan with three cherry cultivars, such as 'Oblachinska', 'Karneol' and 'M 15', grafted on 'Alkavo' rootstock and planted in 2002 by trench method with local, stockpile organic fertilizing. The planting scheme was 4x3 m and they were grown under nonirrigated conditions.
The reaction of the sour cherry cultivars, the intensity of the infestation and the manifestation of cylindrosporiosis and shot hole disease for the optimization of the schemes for sustainable Plant Protection under the climatic conditions of the Troyan region were studied.
'Karneol' was found to have the lowest susceptibility to both diseases studied (shot hole disease <8.7%; white rust 21.3%). The average fruit weight was 5.5 g, it is suitable for fresh consumption, with an extremely balanced taste and with opportunities for organic and sustainable cultivation, and the later ripening period allows to extend the harvesting period.
'M15' had a higher infestation index of Stigmina carpophila (Lev.) Ell (15.3%) compared to the other two cultivars and was more susceptible. Infestation index of Blumeriella jappii (Rehm.) was slightly higher, but was well below 50%. It has attractive fruits with greater weight, bears abundant fruit and can be included in the cultivar list of modern sustainable technologies.

Key words: *cherries, fungal diseases, climatic conditions, biometric indicators.*

THE RESISTANCE OF PEACH TO THE ATTACK OF SOME PATHOGENS IN CLIMATE CHANGE CONDITIONS

Cristina MOALE[1], Leinar SEPTAR[1], Corina GAVĂT[1], Ion CAPLAN[1], Alexandru OPRIȚĂ[1], Gheorghe LĂMUREANU[1], Florin OANCEA[2], Marius GHIUREA[2], Mălina DESLIU-AVRAM[2]

[1]Research Station for Fruit Growing Constanta, 25 Pepinierei Street, 907300, Valu lui Traian, Constanta, Romania
[2]National Institute for Research & Development in Chemistry and Petrochemistry - ICECHIM, 202 Splaiul Independentei, District 6, 060021, Bucharest, Romania

Corresponding author email: moalecristina@yahoo.com

Abstract

The studies were carried out over a period of four years (2018-2021) in a plot at the Research Station for Fruit Growing (RSFG) Constanta. This paper presents the manner in which the ten peach tree cultivars reacted to the climate changes and the attack of pathogen agents: Taphrina deformans Berk et Tull, Cytospora cincta Sacc, Monilinia laxa and Monilinia fructigena Aderh Ruhl Honey. The cultivars with resistance, tolerant (T) to Taphrina deformans (without attack), in the studied period were 'Mimi', 'Catherine Sel.1' and 'Raluca'. The 'Filip' cultivar showed sensitivity (S) towards the Monilinia laxa in 2019 and 2020. As far as for the Cytospora cincta pathogen the cultivars tolerant (T) were 'Collins' in all studied years and 'Filip' in 2018 and 2019. The obtained results demonstrate the importance of choosing the assortment of cultivars, taking into account the favourability of the area, as well as the climate and soil conditions.

Key words*: Cytospora cincta, Monilinia laxa, climate changes, natural infection.*

THE EFFICACY OF SOME ORGANIC PRODUCTS IN THE CONTROL OF BROWN ROT (*MONILINIA* SPP.) IN EUROPEAN PLUM (*PRUNUS DOMESTICA* L.)

Claudiu MOLDOVAN[1], Ioan ZAGRAI[1], Luminița ZAGRAI[1], Georgeta GUZU[1] Smaranda ROȘU-MAREȘ[1], Aurel MAXIM[2]

[1]Fruit Research & Development Station Bistrița, 3 Drumul Dumitrei Nou, 420127, Bistrița, Romania
[2]University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, 3-5 Calea Mănăștur, 400372, Cluj-Napoca, Romania

Corresponding author email: maxim0067@yahoo.com

Abstract

Organic crops in fruit growing are constantly increasing due to the market demand for residue-free products. In this context, successful organic crops require an effective control of major diseases and pests. Brown rot caused by Monilinia spp. is one of the most important and common diseases with great economic impact in plum crop. The objective of this study was to evaluate the efficacy of some organic products in brown rot control into a plum orchard by assessing disease incidence when compared with treatments with conventional fungicides. An experimental scheme of phytosanitary treatments (organic and conventional) was carried out on two plum cultivars ('Stanley' and 'Reine Claude d'Althan'), throughout two consecutive vegetative periods (2020-2021), comprising a total of six treatments with fungicidal effect. The experience was divided in three blocks: organic, conventional and untreated control. According to the results obtained along the two years of study, the average frequency of brown rot damage for both plum cultivars was 9.5% in the conventional variant, 14.3% in organic variant, while untreated variant recorded 23.1%. The results revealed a good potential for brown rot control by using the organic scheme treatments proposed but it's need to be confirmed in a long term study so that to become a suitable and reliable candidate to replace the conventional one.

Key words: *brown rot, control, disease, organic crop, plum.*

PRELIMINARY RESULTS REGARDING THE BEHAVIOUR OF DIFFERENT PEACH VARIETIES UNDER DIFFERENT PLANTING DENSITY

Ailin MOLOȘAG, Cristian CĂLINIȚĂ, Damian DRAGOMIR, Cătălin Viorel OLTENACU

Fruit Research and Development Station Băneasa, 4 Ion Ionescu de la Brad Blvd, District 1, Bucharest, Romania

Corresponding author email: molosag.ailin@scdpbaneasa.ro

Abstract

The paper shows preliminary results of the study regarding the behaviour of peach varieties cultivated in intensive system, aiming to find the best solution in terms of economic and sustainability results. The study was carried out on plantation established in 2019 at FRDS Băneasa, farm Moara Domnească, county Ilfov in the Vlăsiei Plain. In 2019, three peach varieties ('Catherine Sel. 1', 'Filip', Sprincrest') with different ripening periods were planted. Rootstock used: Tomis 1. The tree canopy is: Bi-Baum®. The peach trees were planted at 4,0×1.5 m, 4.0×2.0 m and 4.0×2.5 m, upon a randomized block design, with drip irrigation. Between the rows, soil was kept tilled and without grass. In 2020 and 2021 measurements were made on early stage growth of tree for: the trunk diameter increase, the shoot length and the trunk cross-sectional area of tree. During our study we found that the planting distance influenced especially average shoot length increase and average trunk diameter and average shoot length are linked together. The study will continue especially to find out the density influence on productivity.

Key words*: peach, varieties, densities, growth dynamic.*

FRUIT CHARACTERISTICS AND SENSORIAL ANALYSIS OF "SWEET" SERIES CHERRIES CULTIVARS GROWN IN BUCHAREST AREA

Alexandru MIHĂESCU, Forin BACIU, Lavinia Mihaela ILIESCU, Adrian ASĂNICĂ, Florin STĂNICĂ

University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: iliescu_lavinia@yahoo.com

Abstract

The aim of this paper is presenting the data gathered by analyzing the fruit resulted from the experimental "Sweet" cherry cultivars crop, which was established in the Experimental Field of Faculty of Horticulture, at the University of Agronomic Sciences and Veterinary Medicine of Bucharest. The trees of five Italian new sweet cherry cultivars grafted on two rootstocks: GiSelA5 and GiSelA6 were grown in two planting systems, Bi Baum® at 4.0 x 1.5 m and Trident at 4.0 x 2.0 m. Kordia and Regina were planted as control After harvesting, some fruit analyses were conducted, such as size, stone/flesh ratio, flesh firmness, soluble solids, total sugars and ascorbic acid content. Fruit shape, flesh color, taste and flavor were analyzed through sensorial examination conducted by respondents, which had to evaluate each characteristic using a standard measuring system, ranging from 1 to 5. The results showed that the "Sweet" cultivars are highly appreciated, being a good choice for the farmer looking to satisfy the demand of the modern consumer: high quality fruit, in terms of size, firmness and taste.

Key words*: Prunus avium, fruit characteristics, consumer preference, questionnaire.*

PROPERTIES OF GRANULAR ORGANO-MINERAL FERTILIZER AND THE INFLUENCE OF ITS APPLICATION ON SOME CHEMICAL PROPERTIES OF THE SOIL IN AN APPLE PLANTATION, JONATHAN VARIETY

Elena Mihaela NAGY[1], Claudia NICOLA[2], Mihaela PARASCHIV[2], Marius Andrei MIHALACHE[1]

[1]National Institute of Research-Development for Machines and Installations Designed for Agriculture and Food Industry - INMA Bucharest, 6 Ion Ionescu de la Brad Blvd, District 1, 013813.Bucharest, Romania
[2]Research Institute for Fruit Growing Pitesti - Maracineni, 402 Marului Str., Maracineni, 117450, Pitesti, Romania

Corresponding author email: nagy_m2002@yahoo.co.uk

Abstract

The physical-mechanical properties, as pH and compressive strenght, determined for the fertilizer granules obtained by enriching the compost from urban sludge with mineral fertilizers with N, P, K, fall within the norms imposed on organo-mineral fertilizers. Applying organo-mineral fertilizer to acidic soil in an apple orchard improved the physico-chemical properties of the soil. The experimental factor was the fertilizer dose, placed randomly, in five variants and four repetitions. One year after fertilization, the soil reaction was significantly improved (from pH = 5.4 to pH = 5.80). The mobile phosphorus content in the soil increased significantly in the fertilized variant with 40 t fertilizer / ha. The humified organic matter was at a high level in variant with 60 t/ha (humus = 4,25%) compared to the control variant (humus = 1.58%).

Key words*: biosolid. organo-mineral, fertilizer, properties, soil.*

FRUIT QUALITY OF TWO PLUM CULTIVARS GRAFTED ON 'DOCERA 6' (*PRUNUS DOMESTICA* L. X *PRUNUS CERASIFERA* EHRH.) ROOTSTOCK

Marieta NESHEVA[1], Vanya AKOVA[1], Nesho NESHEV[2]

[1]Agricultural Academy, Fruit Growing Institute, 12 Ostromila Str, Plovdiv, Bulgaria
[2]Agricultural University - Plovdiv, 12 Mendeleev Blvd, Plovdiv, Bulgaria

Corresponding author email: marieta.nesheva@abv.bg

Abstract

The most commonly used rootstock for plum cultivars in Bulgaria is the seedling P. cerasifera Ehrh. In studies concerning the resistance of some rootstocks to the Plum Pox Virus, good results were obtained for the clonal rootstock 'Docera 6 '. Considering that plum fruit quality depends mainly on the scion genotype, but could be influenced by the rootstock as well, the objective of the current study was to evaluate the fruit quality of the plum cultivars 'Jojo' and 'Topgigant Plus', when grafted on 'Docera 6'. The same cultivars grafted on the seedling rootstock P. cerasifera were used for comparison. The trees were planted in 2016 at the Fruit Growing Institute of Plovdiv, Bulgaria. In 2020-2021 fruit biometrical data, fruit flesh firmness, TSS (°Brix), skin colour and fruit flesh colour were measured. For evaluating the consumer acceptance and nutritional value of the fruits, sensory and chemical analyses were performed. All of the studied parameters were significantly influenced by the cultivar. The largest fruits were measured for the combination Topgigant Plus/Docera 6 (71.53 g). The content of sugars and organic acids were the highest in 'Jojo' fruits.

Key words*: European plum, evaluation.*

EFFECTS OF FOLIAR APPLICATION OF FERTILIZERS LOADED INTO SILICEOUS NANOPOROUS MATERIALS ON SWEETS ALMONDS PHOTOSYNTHESIS

Florin OANCEA[1], Marius GHIUREA[2], Cristina MOALE[3], Carmen LUPU[2], Carmen SÎRBU[4], Traian CIOROIANU[4]

[1]INCDCP-ICECHIM, 202 Splaiul Independentei, Bucharest, Romania
[2]National Institute for Research & Development in Chemistry and Petrochemistry, 202 Splaiul Independentei, Bucharest, Romania
[3]Research Station for Fruit Growing Constanța, 25 Pepinierei Str., Valu lui Traian, Romania
[4]National Research and Development Institute for Soil Science, Agrochemistry and Environment Protection, 61 Mărăşti Blvd, Bucharest, Romania

Corresponding author email: florin.oancea@icechim.ro

Abstract

We loaded NPK foliar fertilizers in the siliceous nanoporous material, diatomaceous earth, and, respectively, zeolites. Such combinations intend to valorize the particle film formation characteristics of siliceous nanoporous material and generate a slow-release formulation of the NPK fertilizer, exploiting the excellent features of the used siliceous nanoporous materials (SNMMs) as ion exchangers. The adhesion to leaves of the siliceous nanomaterial was enhanced by incorporating 5% water-soluble chitosan. The foliar fertilizer complexed with SNNMs was applied for two consecutive years, 2020 and 2021, as two treatments, in a dose equivalent to 7,5 kg per ha. to sweet almond (Prunus dulcis), cv. Preanîi. The experiments were done in the orchard located in Valul-lui-Traian (Constanza, Romania), Lat. 44°, 10'38,05" N, Long. 28°C, 29', 4,54". The analysis of the experimental data demonstrate that the application of the SNNMs complexed with foliar fertilizer, in dose equivalent to 7.5 kg/ha, enhanced the photosynthesis process in sweet almond due to a combined effect, optimization of the leaf temperature, increase of the substomatal CO2 concentration and higher chlorophyll content.

Key words*: siliceous natural nanomaterials, foliar fertilizer, particle film formation, enhanced photosynthesis.*

RESEARCH ON GENETIC RESISTANCE OF THE ELMAR APRICOT VARIETY AT LOW TEMPERATURES

Vladuţ Alexandru OPRIȚA[1], Corina GAVAT[1], Leinar SEPTAR[1], Ion CAPLAN[1], Andrei CERNATESCU [2]

[1]Research Station for Fruit Growing Constanta, Pepinierei Street, No. 25, 907300, Valu lui Traian, Constanta, Romania
[2]Agricultural Payments and Intervention in Agriculture, Tomis Street, Constanţa, Romania

Corresponding author email: olaviani@yahoo.co.uk

Abstract

The south-eastern part of Romania, especially the one of influence of the Constanta Fruit Resort, has faced in the last years with serious problems generated by the late and the return frosts. Late frost that occurred in spring affect apricot plantations, causing irregularities in the constancy of fruit production and their quality, gummy leaks and sensitivity of trees to the attack of apricot-specific pathogens. The research was conducted in an orchard of apricot aged 9 years, located at 18 km away from Constanta. Trees planted at a distance of 4x4m were studied during the vegetation season paying particular attention to resistance to low temperature. In the winter of 2017, temperatures decreased to -17 degree C and produced losses of flower buds. In the spring of 2018, the 'Elmar' variety bloomed well, 100% of flower buds being resistant to negative temperatures from winter. In 2019 was a warm winter but the temperature decreased in January to -17 degree C and the trees suffered a thermal shock. Following, resistance to frost decreased and the percentage of flower buds affected was 76.6%. In 2020 'Elmar' variety was not affected. In February of 2021 were, recorded temperatures of -16 degrees C associated with very cold wind, the flower buds were affected in 60%.

Key words*: thermal shock, temperatures, flower buds.*

RESEARCH CONCERNING MORPHOLOGY AND PRODUCTIVITY OF SOME STRAWBERRY VARIETIES MULTIPLIED BY BIOTECHNOLOGY

Constantin PĂUN

University of Agronomic Sciences and Veterinary Medicine of Bucharest,
59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: mycosti506@yahoo.com

Abstract

Strawberry (Fragraria grandiflora) production has been developed in the past 10 years due to superior economic advantages and relatively simple culture technology. Easily commercialization on the market and industrial products obtained by processing, make from strawberry (Fragraria grandiflora) culture a passion and a profitable business. Were studied very old strawberry (Fragraria grandiflora) varieties and new Romanian varieties that could be grown all over the world. Variety Red Gauntlet is a productive variety with quality fruits and production can reach 20 t / ha (cultivated in V2 variant) and 36 t / ha (cultivated in V4 variant). The new varieties are very productive and can produce in optimal conditions of culture 40 t / ha (Delicious and Viva). The same performance has and the variety Mara. Fruit production increased with the application of organic fertilizer and soil mulching material. New varieties have a very high yield potential and technological measures stimulated the production and fruit quality.

Key words*: strawberry, variety, productivity.*

STORAGE CONDITIONS INFLUENCE ON STANLEY AND BLUEFREE ORGANIC PLUMS QUALITY

Andrei PETRE[1], Andreea STAN[1], Violeta Alexandra ION[1], Ioana CĂTUNEANU[1], Mihai FRÎNCU[1], Adrian Constantin ASĂNICĂ[2]

[1]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: andrei.petre@qlab.usamv.ro

Abstract

The paper presents the influence of storage conditions on two varieties of plums: 'Stanley' and 'Bluefree'. In order to assess the influence of different factors, several indicators were taken into consideration: physiological parameters, quality indicators and bioactive compounds variations. Both 'Stanley' and 'Bluefree' plums varieties were harvested at the end of August 2021 from an organic orchard located in Prahova county and stored in three different condition: 1) normal atmosphere (NA) with 1˚C and 95% relative humidity (RH), 2) controlled atmosphere (CA) conditions with 1˚C, 95% RH, 3% O_2 and 5% CO_2, and 3) CA conditions with 1˚C, 95% RH, 1.5% O_2, and 10% CO_2. The samples were evaluated in seven different moments: initially (at harvest), after 2, 4, 6, 8, 10, and 12 weeks of storage. For both 'Stanley' and 'Bluefree' varieties, the storage period were shorter in NA than for those stored in CA conditions (2 weeks shorter for 'Stanley' variety and 3 weeks shorter for 'Bluefree' samples). The results showed that total titratable acidity and dry matter content registered similar variation trend during storage period for both samples, stored in all conditions. The obtained results suggests that the plums stored in controlled atmosphere conditions, kept their qualities better and for longer than those stored in NA.

Key words*: antioxidant activity, controlled atmosphere, normal atmosphere, polyphenols, storage.*

EVALUATION OF FOUR SEA BUCKTHORN BIOTYPES FROM THE SPONTANEOUS FLORA OF ARGEŞ COUNTY, ROMANIA

Amelia PETRESCU[1], Mihaela PARASCHIV[1,2], Monica STURZEANU[1]

[1]Research Institute for Fruit Growing Pitești - Maracineni,
402 Marului, Maracineni, Arges County, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest,
59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author e-mail: mihaela1mail@yahoo.ca

Abstract

Hippophae rhamnoides L. subsp. carpatica Rousi is one of the nine subspecies of the genus Hippophae, which belongs to the family Elaeagnaceae and its native area is East - Central and South - East Europe (Austria, Germany, Hungary, Romania, Serbia). In Romania, sea buckthorn grows spontaneously in the Subcarpathian area of Moldova and Muntenia but also may be found down to Black Sea coast, where sometimes forming groves or even dense bushes. This study aims to identify new biotips for horticulture studies, in breeding programs, as well to ensure the preservation of germoplasm resources of interest to spontaneous species of Hippophae rhamnoides out of the natural enviroment from the center of Romania. For this purpose, four biotypes named 'Leordeni 3', Leordeni 4', 'Leordeni 5' and 'Leordeni 6', were selected during 2020-2021 in Leordeni area from Argeş County. All these native biotypes were subjected to study in order to evaluate the fruits quality traits and the results were compared with 'Piteşti 1' cultivar. These researches identified the selection 'Leordeni 4' with the highest values of Vitamin C: 142,56 (mg/ 100 g FW) and also in the total of polyphenols content: 18,97 (mg gallic acid equivalent/ 100 g FW) meanwhile 'Leordeni 6' had good results at fruit weigh 0.59 (g) and soluble solid 12.62 (°Brix).

Key words*: sea buckthorn fruits, biochemical constituents, biometrical measurements, wild flora.*

PRELIMINARY RESULTS REGARDING THE SELECTION OF NEW BLUEBERRY GENOTYPES (*VACCINUM CORYMBOSUM* L.)

Dan POPESCU[1], Cosmin Alexandru MIHAI[1], Ana Cornelia BUTCARU[2], Mihaela IORDĂCHESCU[2], Adrian Constantin ASĂNICĂ[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: cosmin.mihai@horticultura-bucuresti.ro

Abstract

Cultivated blueberry (Vaccinium corymbosum L.) is a particularly important species from an economic, nutritional and medical point of view, due, among other things, to its high anthocyanin content and antioxidant activity. Therefore, obtaining new valuable genotypes that are resilient and adaptable to changing climatic conditions is a priority for breeders. The genotypes studied were obtained by a classical method of breeding, more precisely by free pollination, the seeds being cold stored, and then sown in planter boxes. Germination lasted as long as two years for some genotypes. The article presents the first phenotypic results for the obtained genotypes, such as vigor, plant habitus, differences and similarities regarding the foliar system. Twenty locally ('Lax', 'Compact', 'Simultan', etc.) and internationally (Duke, Pink Lemonade, Brigitta, etc.) important cultivars were used as genitors.

Key words: *highbush blueberry, high chill cultivars, genetic variability, blueberry breeding.*

IMPACT OF SOIL MAINTENANCE SYSTEMS ON THE VEGETATIVE AND REPRODUCTIVE MANIFESTATIONS OF 'KATINKA' CULTIVAR

Georgi POPSKI, Boryana STEFANOVA, Petko MINKOV

Agricultural Academy, Institute of Mountain Stockbreeding and Agriculture, 281, Vasil Levski str., Troyan 5600, Bulgaria

Corresponding author email: g.popski@abv.bg

Abstract

The study was conducted in RIMSA-Troyan in the period 2014-2018, in a plum plantation of 'Katinka' cultivar, under non-irrigated conditions, on pseudo-podzolic gray forest soils, poorly stocked with nutrients. The impact of different soil surface management systems (fallow, natural grassland, artificial grassland) on vegetative and reproductive indicators of plum trees was observed. Data showed that the largest growth of the trunks was registered in soil managed as an artificial grassland (trunk section 2014-30.01cm²; 2015-39.01cm²; 2017-60.56cm²; 2018-70.92cm²) and the highest annual growth was observed for each year of the study period, formed by higher number of annual twigs. In the formation of the volume and projection of the crowns, no patterns have been established regarding the soil management way. The highest yields were reported in 2017 with 14 kg/tree and in 2018 with 9.1 kg/tree from an artificial turf as a soil management system, which had a positive effect on other reproductive indicators, such as weight and size of fruit.

Key words: *plum, soil management systems, growth manifestations, reproduction.*

ASSESSING THE RESPONSE TO NATURAL POWDERY MILDEW INFECTIONS OF SOME ROMANIAN AND FOREIGN APPLE CULTIVARS IN THE ENVIRONMENTAL CONDITIONS OF NORTHERN TRANSYLVANIA

Smaranda Doina ROŞU-MAREŞ

Fruit Research & Development Station Bistrita, 3 Drumul Dumitrei nou, Bistrita, Romania

Corresponding author email: rmsd_smery@yahoo.com

Abstract

Powdery mildew is one of the most widespread and damaging fungal diseases of apple. That is why we consider important the evaluation of some Romanian cultivars whose expansion in culture is desired, in terms of behavior relative to the fungus Podosphaera leucotricha. The experiments took place in the period 2019-2021 in the experimental plots of SCDP Bistrita and targeted 6 Romanian cultivars compared to 5 foreign cultivars widespread in orchards in this area. The assessment was made both in the untreated plots and in the plots where conventional treatment schemes were applied in accordance with the IPM principles. The results highlight the cultivars created at SCDP Bistrita, 'Aura' and 'Starkprim', which, together with 'Starkrimson' stood out due to the absence of powdery mildew symptoms in the three years. 'Idared' and 'Jonathan' cultivars known to be susceptible were the most affected, followed by 'Golden Delicious'. 'Florina', 'Generos' and 'Auriu de Bistrita' showed a medium to low susceptibility while 'Bistritean' and 'Salva' showed only sporadic symptoms.

Key words*: Conventional treatments, field trial, Podosphaera leucotricha, powdery mildew tolerance.*

DEGREE OF CONTROL OF WEEDS UNDER THE INFLUENCE OF AGRO-TECHNICAL MEASURES AND HERBICIDES IN A PEACH PLANTATION *(PRUNUS PERSICA* L.)

Daniela Nicoleta SCEDEI, Florin FIRU, Corina Constanța SÎRBU, Olimpia Alina IORDĂNESCU, Anișoara DUMA-COPCEA, Casiana MIHUȚ, Ramona ȘTEF, Alin CĂRĂBEȚ, Carmen BEINȘAN, Simion ALDA

Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" fromTimisoara, 119 Calea Aradului, Timișoara, Romania

Corresponding author emails: dana_olaru78@yahoo.com; corinasirbu06@yahoo.com

Abstract

The research was carried out on a family farm in Periam, Timis County, and studied the Redhaven peach variety. The soil where the orchard was placed is a chernozem, moist phreatic, moderate hyposodic between 50-100 cm, weak carbonate, deep on medium loessoid materials, medium loam / medium loam. The value of the apparent density (AD) is extremely low in the Atk surface horizon with a value of 1.10 g/cm^3, very low in the range of 18-75 cm, and low in the Amk2 horizon with a value of 1.35 g/cm^3. For this experiment, the randomized block method was used, and 8 experimental variants were chosen, which were placed on 4 rows of trees, resulting in 4 repetitions with 32 experimental plots. The surface of an experimental plot was 12.20 m^2. From the obtained data, can be observed that the effectiveness of the weed control measures materialized through the productions obtained in the two experimental years. Following the application of weed control measures, the production obtained in 2019 had values between 12.78 t/ha and 20.65 t/ha, and in 2020 the production was between 11.50 t/ha and 18, 65 t/ha.

Key words*: peach, herbicide, weed infestation, pest control, production*.

EFFECT OF THE RADICULAR AND FOLIAR FERTILIZER ON FRUIT QUALITY IN THE PEACH ORCHARD

Leinar SEPTAR, Corina GAVĂT, Cristina MOALE, Alexandru OPRIȚĂ, Ion CAPLAN, Ioan STOLI, Luana BOCIOROAGĂ, Andreea BALCAN

Research Station for Fruit Growing Constanta, 25 Pepinierei Street, 907300, Valu lui Traian, Constanta, Romania

Corresponding author email: septarleinar71@gmail.com

Abstract

Nutrient management is a determining element of the technology in fruit quality. Significance of foliar fertilization has been increased continuously over the last years, as it can directly improve the vegetative and generative performance of the trees. In this study we aimed to evaluate the effect of the radicular (NPK+S) and foliar (Cropmax) fertilizer on fruit quality parameters in a peach orchard during 2019 -2021 period. According to our results, the weight of the fruits increased by 40% in the b1 treatment and 64% in the b2 treatment at Filip cultivar and by 27% in the b1 treatment and 49% in the b2 treatment at Catherine sel. 1 cultivar in the three years of study compared to the control treatment. In conclusion, the fruit quality can be improved in peach orchard using radicular and foliar fertilizers.

Key words*: climate conditions, fertilization, peach, weight.*

SENSORY EVALUATION AND CUSTOMERS' PERCEPTION OF SOME PAWPAW (*ASIMINA TRILOBA* DUNAL) PRODUCTS

Elena Gabriela STAN, Lavinia Mihaela ILIESCU, Florin STĂNICĂ

University of Agronomic Sciences and Veterinary Medicine of Bucharest,
59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: iliescu_lavinia@yahoo.com

Abstract

Pawpaw (Asimina triloba Dunal) is a native North American fruit species that belongs to the Annonaceae family. In Romania, it was introduced for the first time in 1926, by Suciu family from Alba County, but for many decades remained unknowen. Extended studies on the plant and new varieties are made at the Experimental Field, within the Faculty of Horticulture in Bucharest, starting with 2000. The purpose of this paper is to present the sensory evaluation of seven pawpaw processed products: pawpaw ice cream with jujube and with honey; pawpaw yoghurt with chokeberry, sea-buckthorn, honey and biscuits; pawpaw with sweet cottage cheese; pawpaw chocolate bar with sweet potato. Customers' perception consisted on the evaluation of general appearance, colour, texture, taste and flavour, noticed with grades from 1 to 7. The results showed that most of analysed products have been positively appreciated by consumers and their preferences varied with gender, age and origin.

Key words*: customers' preferences, food products, northern banana, raw materials.*

OLD LOCAL APPLE GENOTYPES THREATENED WITH EXTINCTION

Boryana STEFANOVA, Petko MINKOV, Georgi POPSKI

Agricultural Academy, Institute of Mountain Stockbreeding and Agriculture, 281 Vasil Levski str., 5600, Troyan, Bulgaria

Corresponding author email: stefanova_b@abv.bg

Abstract

During research expeditions in the Central Balkan Mountain region, trees of late-ripening (mid-October), rare local cultivars, and forms of apples with valuable pomological and biological qualities were marked. In 2021, all marked forms bore abundant fruit. The highest yield (280 kg per tree) was registered in 'Meka Shekerka' cultivar (MS F1). The fruit weight was on average 59.50 g, obloid form, low percentage of dry matter (12%), a high percentage of total sugars (18%), and the highest glucoacidimetric coefficient. BF1 was distinguished by yields of 140-150 kg per tree, very good taste of the fruit (lowest acid content 0.27%), attractive appearance (green-yellow with a blush on the sunlit side), white fruit flesh, pleasant taste with a pronounced aroma of green apple, abundant waxy coating, with a mass of 86.17g and globose fruit shape. Our scientific data are compared with the information obtained from the local population on age, origin, fruitfulness, use, and distribution in the region.

Key words*: apple, local cultivars and forms, fruit weight, fruit skin colour, chemical composition.*

BEHAVIOR OF PLUM VARIETIES GROWN IN DRYANOVO EXPERIMENTAL STATION TO ECONOMICALLY IMPORTANT DISEASES

Silvena TODOROVA[1], Petko MINKOV[2], Teodora MIHOVA[2]

[1]Experimental Station of Plum - Dryanovo, a branch of RIMSA, Agricultural Academy, 281 V. Levsky Str., 5600, Troyan, Bulgaria
[2]Research Institute of Mountain Stockbreeding and Agriculture, Agricultural Academy, 281 V. Levsky Str., 5600, Troyan, Bulgaria

Corresponding author email: silvena_koleva@mail.bg

Abstract

The behavior of plum varieties grown in Dryanovo Experimental Station for the period 2018-2020 to the economically important diseases of the plum (Polystigma; Monilinia fructigena; Stigmina carpophila, Tranzschelia-pruni spinosae.) was studied.
Sensitive to red leaf spots were the plum varieties Yoyo, Chachanska lepotitsa, Chachanska najbolie and Nevena, according to the Stanley standard (slightly sensitive). With regard to late brown rot and powdery mildew, a high degree of sensitivity manifested variety Tegera. Nevena and Balvanska Slava proved to be practically resistant to these diseases. Plum rust tolerant plums (Tranzschelia-pruni spinosae) include the varieties Yoyo, Balvanska Slava, Nevena, Gabrovska, Tegera and Hanita. From the study on the conditions of Dryanovo, Bulgarian varieties show low to medium susceptibility to economically important diseases.

Key words: *Plum, economical important diseases, Polystigma; Monilinia fructigena; Stigmina carpophila, Tranzschelia-pruni spinosae.*

THE INFLUENCE OF CHANGES IN CLIMATIC CONDITIONS ON THE BIOLOGY OF THE APPLE WORMS LEPIDOPTERA - TORTRICIDAE

Cristina Ionela TURCU[1], Mihai TĂLMACIU[2], Nela TĂLMACIU[2], Monica HEREA[2], Simona-Mihaela CHELARU[1], Ionel PERJU[1]

[1]Research Station for Fruit Growing Iaşi, Romania
[2]"Ion Ionescu de la Brad" University of Life Sciences Iasi,
3rd Mihail Sadoveanu Alley, Iasi, Romania

Corresponding author email: simona.chelaru17@gmail.com

Abstract

The pest Cydia pomonella L. is present in all countries where the apple tree is grown (CABI 2021), the damage done by this species being considerable. The lower threshold of development of the species under study is 9°C that influences the appearance in apple plantations of butterflies, it was recorded in the analyzed area on May 9 in 2019 and May 1 2020, a period during which the sum of the temperature degrees did not meet the thermal constant (K) of the species worth 624°C (Rosca I. et all., 2011). The research was carried out between 2019-2020 at the Research Station for Fruit Growing Iasi, Romania using AtraPom traps (ICCRR Cluj-Napoca) to determine the biological cycle of the Cydia pomonella L. species in correlation with the influence of changes in climatic conditions.

Key words*: apple, traps, biological cycle, thermal constant.*

THE PHYTOVIRAL STATUS OF SOME NEW ESTABLISHED SWEET CHERRY ORCHARDS IN MOLDOVA REGION, ROMANIA

Luminița Antonela ZAGRAI, Ioan ZAGRAI, Smaranda Doina ROȘU-MAREȘ, Georgeta Maria GUZU, Claudiu MOLDOVAN, Zsolt JAKAB-ILYEFALVI, Anca Maria ȘOFRON

Fruit Research & Development Station Bistrita, 3 Drumul Dumitrei Nou, 420127, Bistrița, Romania

Corresponding author email: izagrai@yahoo.com

Abstract

Ten new established sweet cherry orchards in Moldova region were surveyed in the summer of 2021 to assess the phytoviral status. Nine of these were established with abroad propagated material from Italy, Belgium, Czech Republic and Netherlands, and the other one with material produced in Romania. Two blocks of 200 trees from each orchard were visually monitored for virus-like symptoms and then ten samples per orchard were randomly collected for laboratory testing. Sampling trees were tested for the presence of the following viral pathogens: Prune dwarf virus (PDV), Prunus necrotic ring spot virus (PNRSV), Apple mosaic virus (ApMV), Apple chlorotic leaf spot virus (ACLSV), Plum pox virus (PPV), Arabis mosaic virus (ArMV), Cherry leaf roll virus (CLRV), Raspberry ringspot virus (RpRSV), Strawberry latent ringspot virus (SLRSV) and Tomato black ring virus (TBRV) by DAS-ELISA using BIOREBA antiserum kits. The presence of Little cherry virus-1(LChV-1) on three samples which expressed symptoms of potentially infections was checked by RT-PCR. One out of ten surveyed sweet cherry young orchards found to be infected by one virus. PNRSV was detected in one orchard with an occurrence of 10%. The average of infection with PNRSV in the surveyed orchards from Moldova was 1%. No other infection was found in the surveyed orchards. The newly established orchards in Moldova region have generally a very good phytoviral status which is an important prerequisite for their success. However, there are some cases with virus infected old orchards in the proximity of the newly established orchards which might represent potential source of infection.

Key words*: propagation material, serological and molecular assays, survey, sweet cherry, virus.*

RESEARCH ON PHYTOPATHOGENIC AND ENTOMOLOGICAL BIODIVERSITY DETECTED IN THE EXPERIMENTAL FRUIT FIELD OF THE FACULTY OF HORTICULTURE OF USAMV BUCHAREST

Cristinel Relu ZALĂ, Rada ISTRATE, Mali-Sanda MANOLE

University of Agronomic Sciences and Veterinary Medicine of Bucharest
59 Marasti Blvd, District 1, 011464, Bucharest, Romania

Abstract

The work is inspired by the concerns of biologist and botanist Traian Săvulescu (1889-1963), founder of the Romanian School of Phytopathology, who in 1928 founded the annual publication Phytosanitary condition in Romania, which presented the manifestation of various diseases in many host plant species, the first publication of this type in the world, followed by similar publications in the United States, Germany, and the Netherlands. Later, the entomologist Constantin Manolache (1906-1977), together with various collaborators, began to publish The situation of animal pests of plants grown in Romania. Both Traian Săvulescu and Constantin Manolache were teachers at the "Nicolae Bălcescu" Agronomic Institute in Bucharest. Fruit tree biodiversity is crucial for nutrition and ecosystem resilience around the world. Phytopathogenic and entomological biodiversity is of particular importance because diseases and pests of fruit trees cause significant loss of quality and quantity. Phytosanitary control plays an important role in reducing these losses. This paper presents the diseases and pests detected in fruit tree species in the experimental field of the Faculty of Horticulture-UASVM Bucharest, during the vegetation period of 2020 and 2021.

Key words*: fruit trees; biodiversity; diseases; pests.*

VITICULTURE AND OENOLOGY

DURABLE VITICULTURE DEVELOPMENT IN DRĂGĂȘANI VINEYARD BY USE THE AHP METHOD TO ASSESSS AND RANK THE MOST SUITABLE GRAPEVINE VARIETIES

Elena-Cocuța BUCIUMEANU[1], Diana Elena VIZITIU[1], Lucian DINCĂ[2], Sergiu Ștefan GORJAN[3]

[1]National Research and Development Institute for Biotechnology in Horticulture Stefanesti - Arges, 37 Bucuresti-Pitesti Road, 177715 - Stefanesti, Arges Co., Romania
[2]"Marin Dracea" National Research and Development Institute in Forestry, 128 Eroilor Boulevard, Voluntari, Ilfov Co., 13 Cloşca Street, 500035, Braşov, Romania
[3]Research and Development Station for Viticulture, 64 Regele Ferdinand Street, Drăgășani, Vâlcea Co., Romania

Corresponding author email: vizitiud@yahoo.com

Abstract

The work was intended to identify the most valuable grapevine varieties for Drăgășani vineyard by means of an analytical hierarchical process (AHP). Eight grapevine varieties zoned for this grapevine growing area were included in the AHP exercise: Negru de Drăgășani, Pinot Noir (for red wines), Crâmpoșie selecționată, Sauvignon, Pinot Gris, Fetească regală, Riesling Italian (for white wines) and Azur (for table grapes). Of these, the results recommended Crâmpoșie selecționată, Negru de Drăgășani and Azur as the most valuable varieties in Drășășani vineyard. These varieties can develop the viticulture in Oltenia and, also, in Romania, offering local alternatives for wine and table grapes. The analyses were carried out using the Expert Choice Desktop software package.

Key words*: Analytical hierarchical process, pairwise comparison, Vitis, durable viticulture, Wine region IIII.*

RESEARCH ON ADAPTATION MEASURES OF VITICULTURE TO CLIMATE CHANGE: OVERVIEW

Georgeta Mihaela BUCUR, Liviu DEJEU

University of Agronomic Sciences and Veterinary Medicine of Bucharest,
59 Marasti Blvd, District 1, Bucharest, Romania

Corresponding author email: mihaela_g_savu@yahoo.com

Abstract

The scientific literature of the last decades presents studies on the influence of global warming on vine, a sensitive plant, considered an indicator of climate change. Adaptation of grapevine to climate change is a major challenge for the vine-growing sector. More attention has been given lately to the methods of mitigating its effects, to maintaining the quality and to production sustainability. The latest research identifies many short-term measures (canopy management, application of sunscreen substances, soil management, pest and disease control, irrigation), medium-term (new training systems, minimal pruning, late pruning, shading nets) and long-term measures (relocation of vineyards, planting systems, land selection, scion/rootstock varieties, photovoltaic panels) to combat the negative effects of this phenomenon. This paper aims to present a synthesis of the studies conducted both in our country and worldwide, regarding measures to ensure the adaptation to new conditions.

Key words*: viticulture, adaptation, climate change, strategies.*

THE MEASUREMENTS OF STARCH AND TOTAL SUGARS CONTENT IN SOME GRAPEVINE VARIETIES (*VITIS VINIFERA* L.) DURING DORMANCY THROUGH DIFFERENT METHODS

Anamaria CĂLUGĂR[1], Mirela Irina CORDEA[1], Anca BABEŞ[1], Melinda FEJER[1], Maria COMŞA[2], Daniela POPESCU[3]

[1] Faculty of Horticulture, University of Agriculture Sciences and Veterinary Medicine Cluj-Napoca, 3-5 Manastur Street, 400272, Cluj-Napoca, Romania
[2]Research and Development Station for Viticulture and Vinification Blaj, G. Bariţiu Street, 515400, Blaj, Romania
[3]Research Department Jidvei Company, 45 Gării Street, 517385, Jidvei, Romania

Corresponding author email: mcordea@usamvcluj.ro

Abstract

Two extraction and measurement methods usually employed to analyze the total sugar and starch contents in plant tissues were investigated with the view to streamlining the process of total sugar and starch determination. Seven-year-old grapevines (table grapes varieties – Muscat de Hamburg, Napoca, Cardinal, Perla of Csaba, and wine varieties - Fetească regală, Muscat Ottonel, Pinot noir, and Fetească neagră) were marked before winter. During dormancy (October-February), starch level in canes was appreciated through iodine in the potassium iodide method and the anthrone method, both methods using the same biological material (grape canes). Through the anthrone method, the soluble sugars, starch, and total carbohydrates were quantified as g % dry substance. Among the used methods, there were similarities regarding the results. The presented selected methods for starch content determination in plant materials are commonly used and sufficiently accurate in measurements made of engineering works.

Key words: *anthrone method, dormancy, grapevine, iodine, starch, soluble sugar.*

EVALUATION OF QUALITY OF SULTANINE AND CORINTH RAISINS OBTAINED FROM GRAPES GROWN IN A COOL CLIMATE

Anamaria CĂLUGĂR[1], Tincuța Marta GOCAN[1], Anca Cristina BABEȘ[1], Ileana ANDREICA[2], Claudiu Ioan BUNEA[1], Florin Dumitru BORA[3], Sandor ROSZA[1*]

[1]University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Faculty of Horticulture, Advanced Horticultural Research Institute of Transylvania, 3-5 Mănăștur Street, 400372, Cluj-Napoca, Romania
[2]University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Department of Economic Sciences, 3-5 Mănăștur Street, 400372, Cluj-Napoca, Romania
[3]Department of Physico-Chemistry and Biochemistry, Research Station for Viticulture and Oenology Târgu Bujoru, Romania

Corresponding author email: rozsa.sandor@usamvcluj.ro

Abstract

Two Vitis vinifera grape varieties 'Sultanine' and '*Corinth*' *were used to obtain raisins. The vines are grown in a cool climate (Cluj Napoca – in NV of Romania, an area not included in a viticultural area). During 2020, the grapes were harvested at 195 g/l –* '*Sultanine*' *and 234 g/l for 'Corinth'. The berries were dehydrated using a household Gorenje 240W drier, at 40°C, for 24 hours. The soluble dry matter content for raisin was higher for raisins of the 'Corinth' variety (61.11%) and for the 'Sultanine' (59.89%). Regarding the moisture of the finished product - raisins, a high content was determined for the variety 'Sultanine' - 19%, followed by the variety 'Corinth' - 15.61%. The rehydration power of raisins had values of over 80% for both types of raisins. For the amateur culture, these varieties can be recommended, given that, in recent years, due to climate change, there have been no temperatures in this area during the rest period that could cause frost over the winter. The warm autumn favoured reaching full maturity for these varieties, even in the conditions in Cluj. Raisins can be easily obtained in the household, by using household dryers..*

Key words*: Corinth, dried berries, dried grapes, grape, raisin, Sultanina, quality.*

USE OF VEGETABLE PROTEINS AS ALTERNATIVES TO PVPP AND CASEINATE FOR REMOVING POLYPHENOLS FROM WHITE GRAPE MUSTS

George Adrian COJOCARU, Arina Oana ANTOCE

University of Agronomic Sciences and Veterinary Medicine of Bucharest, Faculty of Horticulture, 59 Mărăşti Blvd, District 1, 011464, Bucharest, Romania

Corresponding author email: arina.antoce@horticultura-bucuresti.ro

Abstract

Polyvinilpolypirrolidone (PVPP) and potassium caseinate (KCas) are the standard treatments used for removing before fermentation a part of the polyphenolic compounds from white grape musts, in order to prevent their oxidation in the resulted wines. As PVPP is a synthetic polymer and KCas is an animal protein with allergenic potential, in line with the movements toward more natural and vegan products, alternative fining agents are being proposed in the form of vegetal proteins. In this study the fining potential of pea and potato proteins was evaluated compared to PVPP and KCas, by determining the change in colour (CIELab parameters) and the amount of total polyphenols removed from the wines of Welsch Riesling. Each fining agent was applied to the must before fermentation in doses of 10, 20 and 30 g/hl and their effect in wine was analysed. The treatments applied tend to reduce wine colour yellowness (parameter b), shift more toward greener (parameter a), and decrease colour saturation (C). For each treatment the parameters determined spectrophotometrically were in direct correlation with the dose used, even though the total colour differences (ΔE values) of the musts were not perceivable by the naked eye, in the young wines. However, clarification of must with any fining agent significantly removed a part of the total polyphenols in a dose-dependent manner, the efficiency of the fining agents being in the following order: PVPP>Pea>Potato=KCas>Control. To also evaluate the economic impact of using these new alternatives, sensory analysis was also carried out and the costs of treatments were determined.

Key words*: white wine, pre-fermentative, fining agents, CIELab, total polyphenols.*

THE RESVERATROL CONTENT IN BLACK GRAPES SKINS AT DIFFERENT DEVELOPMENT STAGES

Ramona CĂPRUCIU, Daniela Doloris CICHI, Liviu Cristian MĂRĂCINEANU, Dorin Constantin COSTEA

University of Craiova, Department of Horticulture and Food Science, Faculty of Horticulture**,** 13 A.I. Cuza St., Craiova, Romania

Corresponding author email: ramona_capruciu@yahoo.com

Abstract

The resveratrol (3,5,4'-trihydroxystilbene) is a phytoalexin belonging to the class of polyphenolic compounds called stilbene, produced in response to stress factors by a wide variety of plants, including Vitis vinifera. This study presents the high performance liquid chromatography (HPLC) system detection of the forms of resveratrol (cis- and trans-) isomers in the skin of the Cabernet Sauvignon and Merlot black grapes from the Şimnicu de Sus wine grape-growing area during the 2019 and 2020 period. The resveratrol isomers were determined throughout the period of maturation of the studied varieties (15 July to 5 September) of the grape berries skin samples. The resveratrol content of grapes skin decreased constantly from the green phase until the full maturity for both varieties, reaching zero for cis-resveratrol (0.043mg/L for Cabernet Sauvignon variety in 2020) in the matured fruits.

Key words*: cis- and trans- resveratrol, black grapes, grape skin.*

THE EFFECT OF THE PRE-FERMENTATIVE SKIN CONTACT ON THE COLOUR CHARACTERISTICS AND TOTAL PHENOLS OF WHITE WINES

George Adrian COJOCARU, Bogdan Emil ILIE, Arina Oana ANTOCE

University of Agronomic Sciences and Veterinary Medicine of Bucharest,
Faculty of Horticulture, 59 Mărăşti Blvd, District 1,
011464, Bucharest, Romania

Corresponding author email: arina.antoce@horticultura-bucuresti.ro

Abstract

Skin contact for aromatic grapes at low temperatures is essential for the quality of the resulted wines, Sometimes, even non-aromatic grapes can benefit from skin contact so that the wines obtained achieve the desired mouthfeel and aroma. In this study we have evaluated the effect of the pre-fermentative skin contact on a blend of white grapes consisting of 80% of a non-aromatic Romanian variety, Feteasca alba, and 20% of the aromatic variety Muscat Ottonel. The macerations were conducted at controlled temperature for 6 hours (T6) and 12 hours (T12), while for control, no skin contact was allowed (T0). The effects of maceration on the CIELab parameters and total polyphenols (TPI) of resulted wines were evaluated. The wines with 12 hours of maceration (T12) were significantly different from the samples with no maceration (T0) and samples with short time skin contact (T6). The colour differences can be easily perceived by an inexperienced observer, as long as the total colour differences ΔE values (T12-T0) = 3.90 ± 0.98 and, respectively, (T12-T6) = 2.44 ± 0.97. The TPI results suggest that the skin contact period, favours more polyphenol extraction, but also promotes oxidation of polyphenols and then their precipitation.

Key words*: CIELab, pre-fermentative maceration, total polyphenols, white wine.*

AMPELOGRAPHIC AND AGRONOMIC VARIABILITY WITHIN THE 'TĂMÂIOASĂ ROMÂNEASCĂ' CULTIVAR

Daniela Doloris CICHI[1], Felicia STOICA[1], Ramona CĂPRUCIU[1], Mihai CICHI[2]

[1]University of Craiova, Faculty of Horticulture, Horticulture & Food Science Department, 13 A.I. Cuza Street, Craiova, Dolj, Romania
[2]University of Craiova, Faculty of Agronomy, 19 Libertății Street, Craiova, Dolj, Romania

Corresponding author email: danielacichi@yahoo.com

Abstract

The 'Tămâioasă românească' variety (syn. Muscat à petits grains blancs) is one of the oldest and most famous varieties for aromatic wines in Romania. This prospective study aimed to evaluate the variability of some morphological, agrobiological and qualitative features of 'Tămâioasă românească' cv. and of the two clones 'Tămâioasă românească' 104 Dg. and 'Tămâioasă românească' 36 Pt., in the specific conditions of the Drăgășani vineyard, Romania. Also, it aimed to identify some ampelographic descriptors useful for the discrimination between the two clones on the one hand and between the clones and the 'Tămâioasă românească' variety on the other hand. Based on the 48 ampelographic and ampelometric descriptors used and analyzed, our partial results show that there is an important phenotypic variability within the population of the 'Tămâioasă românească' variety.

Key words*: ampelometric descriptors, clones, grapevine, phenotypic variability.*

ABUNDANCE AND DIVERSITY OF *AUCHENORRHYNCHA* SPECIES IN VINEYARDS FROM ROMANIA

Constantina CHIRECEANU[1], Andrei TEODORU[1], Ghica MIHU[2], Teodor PODRUMAR[3], Marioara PUȘCALĂU[2], Daniela DOBROMIR[3]

[1]Research and Development Plant Protection Institute Bucharest,
8 Ion Ionescu de la Brad Blvd, District 1, 013813, Bucharest, Romania,
[2]Vine and Wine Research-Development Station Odobeşti,
61 Street Stefan Cel Mare, Vrancea, Romania
[3]Vine and Wine Research and Development Station Miniş, Arad,
6 Iuliu Maniu, Ghioroc, Arad, Romania

Corresponding author email: cchireceanu@yahoo.com

Abstract

The Auchenorrhyncha is one of the most abundant and species-rich insect groups present on grapevine. In our study there are presented the results on abundance, dominance, constancy and ecological significance as well as species diversity of Auchenorrhyncha group monitored in 2016-2018 and 2020-2021 in a network of ninety-five vine plots distributed in vineyards from Banat, Crişana and Maramureş Hills (Western Romania) and Moldova Hills (Eastern Romania). The collecting of insects was on yellow double sticky traps from May /June to October every year. Scaphoideus titanus, the vector for quarantine disease Flavescence dorée, was the most abundant species in vineyards from both zones, followed by Erasmoneura vulnerata, Empoasca spp., Neoaliturus fenestratus, Anoplotettix fuscovenosus and Fieberiella florii. Number of species varied between 31 and 49 species. Shannon-Wiener diversity indexes was 1.61 bits for insects in vineyards of Moldova Hills and 2.09 bits for insects in vineyards of Banat, Crişana and Maramureş Hills. Simson's diversity index was 0.68 for insects in vineyards of Moldova Hills and 0.83 for insects in vineyards of Banat, Crişana and Maramureş Hills. Sorensen' similarity coefficient was between 0.79 and 0.94 suggesting that the communities of Auchenorrhyncha in vineyards had a similar species composition.

Key words*: Auchenorrhyncha fauna; leafhoppers; planthoppers; Romanian grapevine.*

THE INFLUENCE OF THE ENVIRONMENTAL RESOURCE VARIATION OVER THE GRAPEVINE GROWTH AND YIELD IN DEALURILE CRAIOVEI VITICULTURAL REGION

Dorin Constantin COSTEA, Ramona CĂPRUCIU, iviu Cristian MĂRĂCINEANU, Constantin BĂDUCĂ-CÎMPEANU

University of Craiova/Faculty of Horticulture, A.I. Cuza, 13, Craiova, Romania

Corresponding author email: dinuc3@gmail.com

Abstract

The ecological offer holds an important role in establishing the grapevine areas. The pedo-climatic conditions influence the intensity of the physiological and biochemical processes inside the plant, determine the length of the vegetation period, influence the hydro-mineral feeding system, the quality of crops, and offer singularity to the grapes and wines obtained on a certain area, expressed by the specificity of the viticultural area. Grapevine cultivation with superior productive results requires, besides the biological characteristics of the cultivated soil, the continuous appreciation of the ecological favourablness of the space used for this purpose, in order to identify and then apply the most appropriate counter measures according to the variation of the pedoclimatic conditions. Grapevines are multiannual plants, hence the significant importance of the influence of the annual ecological offer over production, especially its quality. The knowledge of morphological, physiological and biochemical particularities determined by the pedoclimatic conditions is important for the elaboration and support of viticultural technical activities. Grapevines have the ability to adapt to various environmental conditions, however extremely high temperatures (over 350 C) or heatwaves often associated with drought may affect the grapevine physiology and yield. This study was focused on the influence of the environmental resource variation over the intensity of certain physiological processes (photosynthesis, transpiration, stomatal conductance), as well as over the growth and fruit bearing of certain grapevine varieties cultivated in Dealurile Craiovei viticultural region.

Key words*: grapevine, environmental resource, physiological processes, yield.*

RESEARCH CONCERNING THE ECONOMIC EFFICIENCY OF STIMULANTS AND FOLIAR FERTILIZERS IN TABLE GRAPE VARIETIES

Alin DOBREI, Vasile ANDRAS SAUCA, Eleonora NISTOR, Florin BORCA, Alina DOBREI

Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania", Faculty of Horticulture and Forestry, Calea Aradului 119, Timisoara, Romania

Correspondent author email: ghitaalina@yahoo.com

Abstract

The research was carried out during 2019-2020 growing seasons in the Buzias-Silagiu vineyards. The aim of the study was to establish the efficiency of stimulants, biostimulants and foliar fertilizers, in two table grape varieties. In the experimental plots design with three replications, were studied eight treatments which were compared with the control plot in which was applied the conventional fertilization treatment with N_{80} P_{80} and K_{80}. The main investigation was focused on best inputs for increase the expenditure efficiency; stimulants, bio-stimulants and foliar fertilizers were tested in comparison with the chemical treatments applied in the vineyard in order to decrease the chemicals impact on the grapevine by-products and environment pollution. In the all experimental plots were recorded significant positive results compared with the control plot for grape yield, grape production, market value and income respectively. However, experimental plots (V_4 and V_8) had higher spending compared to the control plot. The most profitable experimental plots were V_7 and V_3 while V_8 provide the highest grape yields and market value. For higher profit and less environment and grape yield pollution, climate, soil and treatments must be carefully correlated in the future.

Key words: *grapes, foliar fertilizers, stimulants, yield, profit.*

FERMENTATIVE PROCESS FOR THE PRODUCTION OF GRAPE MARC ENRICHED YEAST - MICROPILOT LEVEL

Mihai FRÎNCU, Corina DUMITRACHE, Răzvan Ionuț TEODORESCU, Diana Iuliana BĂRBULESCU, Violeta Alexandra ION, Carmen Rodica VRÎNCEANU, Florentina MATEI

University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: corina_dumitrache17@yahoo.com

Abstract

Considering current food needs and environmental concerns worldwide, the full use of production and waste reduction is a practice that is increasingly present in our lives. Grape cultivation is one of the most widespread in the world, with more than 77 million tons of grapes harvested only in 2019. Main part of the production enters in the winemaking process. After the process completion, the main waste, grape pomace, is thrown in the field or, in the best case, used in composting processes, losing compounds with significant value. The aim of this paper was to obtain products based on yeast enrich with grape pomace as winemaking by-product (Fetească Neagră variety), rich in polyphenols, and with high antioxidant activity. The grape pomace used for fermentations was obtained following the winemaking processes carried out at the Didactic Research and Development for Viticulture and Pomiculture Pietroasa - Istrița, resort with a history of over 120 years in viticulture. The product thus obtained needs several more tests for the correct evaluation of its superior characteristics in terms of antioxidant properties.

Key words*: grape marc, yeast, fermentations, micro pilot, Pietroasa, Fetească Neagră.*

RESEARCH INTO THE BEHAVIOR OF FRENCH CLONES USED UNDER THE SIMBURESTI VINEYARD

**Sergiu-Ştefan GORJAN, Bogdan Ion TRUŞCĂ,
Raluca Iuliana POPESCU, Bogdan Petruţ COSTEA, Ilie MĂCĂU**

Research and Development Station for Viticulture and Vinification Drăgăşani,
64 King Ferdinand Blvd, Zip Code: 245700, Drăgăşani, Vâlcea, Romania

Corresponding author: gorjansergiustefan@yahoo.com

Abstract

*The study was efectued in the Sâmbureşti vineyard, at S.C. Viti-Pomicola Sâmbureşti S.A. "Valvis Domains" and followed the behavior of vine clones brought from France, varieties recommended in the the CATALOGUE OF VINE VARIETIES ANS CLONES GROWN in FRANCE 2006 a *French Wine and Vine Institute Domaine de l'Espiquette from "Pépinières Duvigneau et Fils".In the study were Sauvignon varieties, clones 159/SO4, 108/SO4, 530/SO4, Cabernet Sauvignon variety, clones 685 / SO4, 160 / SO4, 341 / SO4, Merlot clones 181/SO4, 343 SO4, 1058/SO4. These clones can be used in national and international genetic breeding programs. These clones can modernize and fundamentally develop viticulture in the vineyard and implicitly in Romania, offering prosperity on the human food market.*

Key words: *vineyard, climate, variety, clones, wine.*

THE BEHAVIOUR OF SOME VINE VARIETIES FOR TABLE GRAPES CREATED AT SCDVV IAŞI TO THE MAIN PATHOGENS AND PESTS ATTACK IN THE CONTEXT OF DIFFERENT CLIMATIC CONDITIONS

Andreea-Denisa GHIUR[1], Liliana ROTARU[1], Doina DAMIAN[2], Gabi ZALDEA[2], Ancuţa NECHITA[2]

[1]"Ion Ionescu de la Brad" University of Life Sciences Iași, 3rd Mihail Sadoveanu Alley, Iaşi, Romania
[2]Research and Development Station for Viticulture and Winemaking Iași, 48 Mihail Sadoveanu Alley, Iași, Romania

Corresponding author email: lirotaru@uaiasi.ro

Abstract

Climate change more evident in recent years has been cause changes in life cycle of pathogens and pests, as well as has been increase aggression attack on vineyards. In this sense, in 2020-2021 period was followed the behavior of some vine varieties for table grapes newly created at SCDVV Iași, ‚Mara','Paula' and ‚Aromat de Iași' to the attack of the main pathogens (Plasmopara viticola, Uncinula necator, Botrytis cinerea) and pests (Lobesia botrana, Calepitrimerus vitis and Colomerus vitis). The observation of intensity and frequency on the leaves and grape attack highlight a different behaviour of the studied varieties. The results of the study confirm that the temperature and rainfall from the vegetation period influenced the pathogens attack and pests occur, attack degree and the economic damage threshold, as well as the quantitative and qualitative level of grape production. Also, varieties resistance in specific climatic conditions of the analyzed period under the application of anticryptogamic treatments was appreciated with notes on the OIV scale from 7-9.

Key words*: climate change, pathogens, pests, resistance, table grape.*

THE EFFECT OF ANTI-HAIL NETS ON THE CHLOROPHYLL CONTENT INDEX (CCI), TOTAL AMOUNT OF NITROGEN IN LEAF AND SUGAR IN THE MUST CV. ITALIAN RIESLING

Tomislav KARAŽIJA, Marko PETEK, Mihaela ŠATVAR VRBANČIĆ, Antonio VIDUKA, Boris LAZAREVIĆ

Faculty of Agriculture, Svetošimunska cesta 25, 10 000, Zagreb, Croatia

Corresponding author email: mpetek@agr.hr

Abstract

The objective of this research has been to determine the effect of different color of anti-hail net on cv. Italian Riesling wine variety. The trial was set up on Klanjec wine-growing region (northwestern Croatia) according to randomize complete block design with 3 treatments (control, black net, white net). At harvest the significantly greatest amount of nitrogen was determined in the treatment with black net (1.71% in DM) and the significantly the lowest in the treatment with white net (1.57% in DM). Chlorophyll content index in the first and third sampling (harvest) was directly correlated with the amount of nitrogen. According this in the first sampling significantly highest CCI (15.7) was determined in the control and significantly the lowest CCI in the treatment with white net. In the third sampling relatively highest CCI was determined in the treatment with black net (27.8) and relatively lowest in the treatment with white net (23.0). The amount of sugar ranged from 18.55 % to 21.25 % Brix, with the significantly highest value determined in the treatment with white net, while the control treatment and treatment with black net have no significant differences. The highest amount of nitrogen leaf content and the highest CCI under the black net in harvest indicates later ripening of cv. Italian Riesling wine variety. The highest amount of sugar as a basic parameters of quality under the white net is probably the result of better microclimatic conditions (higher temperature and lower shading). According to this research in areas with critical number of sunshine hours for the cultivation of grapevines we can recommend to use white nets.

Key words*: anti-hail net, grapevine, CCI, nitrogen, sugar.*

RESEARCH ON LAUNCH AND IMPLEMENTATION STRATEGIES FOR A NEW LINE OF WINES IN THE DOMENIILE PRINCE MATEI, DEALU MARE VINEYARD

Elena-Andreea LICA[1], Georgeta Mihaela BUCUR[2]

[1]Averesti Estates, Averesti, Vaslui County, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Marasti Blvd, District 1, Bucharest, Romania

Corresponding author email: mihaela_g_savu@yahoo.com

Abstract

A wine company portfolio, like any Fast-Moving Consumer Goods (FMCG), should be diversified, innovative and very well correlated with the market requirements. Cash absorption and cash generation can be criteria for classifying the products portfolio. This research aims to identify the most efficient methods able to determine the structure and market positioning for Domeniile Prince Matei producer's portfolio. Such methods will be applied to design a new line of wines, to reduce the time for its production and implementation, to achieve the proposed results in the shortest time. The first step was to analyse the Domeniile Prince Matei's brand architecture, determine the profit for the present wine lines by using the Boston Consulting Group matrix, which is based on the relative market share and growth rate. The matrix application provided a general overview of company's products competitiveness and demand, which led to a portfolio rearrangement, a repositioning of the existing wines and creation of a new line of wines to replace the ones identified as unprofitable. Even if the Boston Consulting Goup matrix is a smart reliable tool and helps a lot, in practice is better to take the final decision based on the results of more enterprise strategic analysis methods.

Key words: *Boston Consulting Group Matrix, brand architecture, wine.*

ANALYSES OF THE INFLUENCE OF CROP LOAD ON BIOLOGICAL AND PRODUCTIVE CHARACTERISTICS OF SOME TABLE GRAPE VARIETIES GROWN IN THE SEVERIN VINEYARD

Cristian MĂRĂCINEANU[1], Nicolae GIUGEA[1], Liviu MUNTEAN[2], Ramona CĂPRUCIU[1]

[1]University of Craiova, Faculty of Horticulture, 13 A.I. Cuza, Craiova, Romania
[2]Viticola Muntean, 34 Brâncoveanu Str., Mehedinți, Romania

Corresponding author email: maracineanulc@yahoo.com

Abstract

The paper presents the results regarding the influence of the regulation of inflorescences on the vegetative phases of the Cardinal, Alphonse Lavalleé, Afuz-Ali and Victoria varieties. In parallel, the influence on some technological properties was studied, such as: the production of grapes, extra quality class, and first quality, second quality of grapes, carbohydrate content and acidity. The study was carried out over a period of three years, within the Severin vineyard, in the Severin - Dealul viilor wine center. The results showed that the number of inflorescences on the stem influences the moment of the initiation of the vegetative phases but also the productive properties; the crop load has been identified and ensures optimal results for each studied variety.

Key words*: grape, quality, vegetative phases, crop load.*

STUDY OF THE BEHAVIOR OF THE CENTENIAL SEEDLESS 48MF CLONE IN THE CONDITIONS OF THE MURFATLAR VINEYARD

Anamaria NEGRARU (TĂNASE)[1, 2], Mihai BOTU[2], Aurora RANCA[1], Mădălina-Andreea CIOCAN[1], Ionica DINA[1], Grigore-Valentin BELENIUC[3]

[1]Research Station for Viticulture and Enology Murfatlar, 2 Calea București, Murfatlar, Romania
[2]University of Craiova, 13 A.I. Cuza Street, Faculty of Horticulture, Craiova, Romania
[3] Ovidius University, Faculty of Horticulture, 124 Mamaia Blvd, Constanța, Romania

Corresponding author email: anmtanase@gmail.com

Abstract

A study was performed on the behavior of the 48/9/6 clonal elite selected from a population of the Centennial seedless variety at Research Station for Viticulture Murfatlar, in the period 2016-2020. During the 5 years of observations and determinations, the clonal elite 48/9/6 was noticed which, following the testing at ISTIS (State Institute for Testing and Registration of Varieties), was approved under the name of Centennial seedless 48 Mf in 2021.
From climartic point of view, the research period is characterized by average annual temperatures 2-4 0C higher and less rains (267.9 mm compared to normal 436 mm).
The agrobiological properties, the technological and agroeconomic characteristics were compared to those of the population. The clonal elite is distinguished by a shorter vegetation period (full maturity occurs in the first half of September) and higher fertility. The productivity of the clone (the average weight of a grape bunch) is 527 g compared to 423 g in the population.

Key words: *clonal elites, grapevine, parthenocarpy, seedless grapes, table grapes.*

CLIMATE VARIABILITY AND MAIN NUTRIENTS IN LEAF BLADE AND PETIOLE FOR DIAGNOSE THE GRAPEVINE NUTRITIONAL STATUS

Eleonora NISTOR[1] Alina DOBREI[1], Alin DOBREI[1], Giovanni MATTI[2]

[1]Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara, Faculty of Horticulture and Forestry, Calea Aradului 119, Timisoara, Romania
[2]Universita degli Studi Firenze, Dipartimento Di Scienze Produzioni Agroalimentari E Dell'ambiente, 30 Viale Delle Idee, 50019, Sesto Fiorentino, Italy

Correspondent author email: nisnoranisnora@gmail.com

Abstract

For monitoring the Cabernet Sauvignon nutritional status, leaf blade and petiole tissues collected in flowering and veraison from 2018-2019 growing seasons, were analysed for main macronutrients. Sampling in flowering or veraison, do not show significant differences in variables response. Rather than otherwise, the differences were observed between growing seasons, and the climate variability from 2019 with heavy rain in the spring correlated with low temperatures and the summer and autumn draught associated with hot weather, influenced the absorption of macronutrients, canopy development, and the relationship between leaf blade and petiole macronutrients concentration. Results indicate that leaf blade prevails over petiole for nitrogen (veraison) potassium (flowering) calcium (flowering) and magnesium (flowering) in predicting vine nutrients status while petiole is better indicator for phosphorus (flowering stage). Grape berry mineral main compounds are influence by dry weather and the degree of dehydration. Research results can be used as guide in main macronutrients nutritional status in Cabernet Sauvignon, for regions with similar terroir conditions.

Key words: *climate, Cabernet Sauvignon, juice, petiole, nutrients, quality.*

THE INFLUENCES DEGREE OF VARIOUS FACTORS ON THE DEVELOPMENT OF ENTERPRISES IN THE GRAPES AND WINE SECTOR

Gheorghe NICOLAESCU[1], Olga MOGILDEA[1], Svetlana COCIORVA[1, 2], Ana NICOLAESCU[1, 3], Cornelia VOINESCO[1], Inga COTOROS[1, 5], Andrei KIMAKOVSKI[1, 4], Ion DOSCA[1], Gheorghe MAȚCU[1], Valeria PROCOPENCO[1], Ana Maria NICOLAESCU[1, 3, 5], Mariana GODOROJA[1]

[1]State Agrarian University from Moldova, 44, Mircești str., Chisinau, MD-2049, Republic of Moldova
[2]Center of Excellence for Viticulture and Oenology, 1, Gratiesti str., Stăuceni, MD-4839, Republic of Moldova
[3]NGA Infoconsulting Ltd., 40, Lazo str., Chisinau, MD-2004, Republic of Moldova
[4]Purcari Winery, v. Purcari, d. Stefan Vodă, MD-4229, Republic of Moldova
[5]Academy of Economic Studies of Moldova, 61, Mitropolit Gavriil Bănulescu-Bodoni str., Chisinau, MD-2005, Republic of Moldova

Corresponding author email: gh.nicolaescu@gmail.com

Abstract

The grapes and wine sector in the Republic of Moldova is a strategic one for the national economy. During the 2020-2021 year, a study was conducted on the factors influencing the development of enterprises in the grapes and wine sector in the Republic of Moldova.
The research was carried out within the project: "Impact of macromedia and geographical factors on bankruptcy and business performance of economic entities in the agri-food sector in the Republic of Moldova", project code 20.80009.0807.26, according to contract between SAUM and NARD. The study was conducted by interviewing companies.
As a result of the study it was established: economic factors / risks obtained an average rating of 4.3 points on the scale of 5 pt.; technical and technological factors / risks obtained an average rating of 4.2 points on the scale of 5 pt.; ecological factors / risks obtained an average rating of 4.2 points on the scale of 5 pt.; legislative-legal factors / risks obtained an average rating of 4.1 points on the scale of 5 pt.; information factors / risks obtained an average rating of 4.2 points on the scale of 5 pt.; moral factors / risks obtained an average rating of 4.3 points on the scale of 5 pt.

Key words: *agriculture; development; enterprise; grapes; horticulture; influencing factors; wine.*

MATHEMATICAL APPROACH TO EVALUATION OF THE INFLUENCE OF CLIMATE INDICATORS ON QUALITY OF GRAPES IN SYRAH CLONES

Anelia POPOVA, Velika KUNEVA, Ivaylo DINTCHEV, Veselin IVANOV

Agricultural University Plovdiv, 12 Mendeleev Blvd, Plovdiv, Bulgaria

Corresponding author email: aneliyapopova@abv.bg

Abstract

The aim of the present study is to apply a mathematical approach (correlation and factor analysis) to assess the similarity and remoteness of the impact of climate indicators in some clones of Syrah variety. Their grouping is based on phenological, and technological indicators. Temperatures during the individual experimental years have a dominant influence on the quality of grapes in the individual clones included in the study. As a result of analysis, correlations were established between phenological indicators like follow: sap, bud burst, first leaf separation, flowering, fruit set, veraison, ripeness and technological ones - average mass per bunch, normal and undeveloped berries, percent of clusters and damaged berries, average bunch size (width and length). The phenological indicators - sap flow, flowering and fruit set "pea size" and technological - undeveloped berries, damaged berries have high factor weights in the first component, which is a summary of these indicators, with the highest relative weight in the vines grouping.

Key words*: Syrah clones, phenology, quality components, correlation, factor analysis.*

RESEARCH ON THE AGROBIOLOGICAL AND TECHNOLOGICAL POTENTIAL OF SOME HYBRID ELITE WITH BIOLOGICAL RESISTANCE OBTAINED AT R.D.S.V.V. ODOBEŞTI

Marioara PUŞCALĂU[1], Ionica BOSOI[2], Camelia-Alina DÎRLOMAN[1]

[1]Research and Development Station for Viticulture and Vinification Odobeşti,
61 Ştefan cel Mare Street, 625300, Odobeşti, Romania
[2]"Ion Ionescu de la Brad" University of Life Sciences Iaşi,
3rd Mihail Sadoveanu Alley, Iaşi, Romania

Corresponding author email: mioara_bosoi@yahoo.com

Abstract

The practice of sustainable viticulture by reducing the quantities of pesticides applied by phytosanitary treatments and capitalizing on the ecopedoclimatic conditions specific to each wine-growing area, involves obtaining and promoting vine varieties with complex biological resistance, with high potential for adaptation to changes caused by climate change and valuable agrobiological and technological potential. In response to this, at R.D.S.V.V. Odobeşti were studied in order to evaluate the agrobiological and technological potential three hybrid elites with biological resistance: hybrid elite 10-1-6 (Traminer roz x Isabella), hybrid elite 2-5 (Galbenă de Odobeşti x Lydia) and hybrid elite 10- 18 (Riesling italian x Siebel 6720). This paper presents the ampelographic description and the agrobiological and technological potential of the elites studied during the years 2020 - 2021. The results obtained from this study showed that these hybrid elites have high productive and qualitative potential, show high biological resistance to the main diseases of the vine, and can be proposed for approval in order to improve the national assortment, in the context of sustainable viticulture.

Key words*: agrobiological and technological potential, biological resistance, hybrid elite,*

THE GRAPEVINE PHENOLOGY AND THE CLIMATE CHANGES IN TARNAVE VINEYARD

Horia Silviu RĂCOARE, Maria Lucia ILIESCU, Liliana Lucia TOMOIAGĂ, Maria COMȘA, Alexandra Doina SÎRBU, Maria Doinița MUNTEAN, Veronica Sanda CHEDEA

Research Station for Viticulture and Enology Blaj (SCDVV Blaj),
2 Gheorghe Barițiu Street, Blaj, Romania

Corresponding author email: chedeaveronica@yahoo.com

Abstract

In the context of climate change, the paper presents an analysis of the evolution of grapevine phenophases, in the period 1991-2021, for four grapevine cultivars Selena, Blasius, Rubin and Radames, and two clones Sauvignon blanc 9 Bl, Feteasca alba 29 Bl homologated at SCDVV Blaj. The study is based on the climatic and phenological data from SCDVV Blaj. The climatic data have been processed into fourteen parameters and for the phenological periods the starting date was analyzed. Regarding the average annual temperature, during 2010-2021 there is an increase of 1.1 ºC compared to the multiannual average reference temperature (calculated as the annual average of the years 1975-2010), which means that in the studied area, during the period 2010-2021 there was a warming compared to reference years. The average duration of the vegetation period from 2010-2021 is shorter than the reference period by 3.2 days. In 2011 the annual aridity index denotes a semi-arid dry climate, and in 2012, 2015, 2017 and 2019 a moderately humid climate. The hydrothermal coefficient was higher in the studied period compared to the reference period, registering values between 1.0 (2011) and 2.8 (2016), which has a positive influence on grape production. The Huglin index for the studied period is between 2237.6 in 2021 and 2928.5 in 2012, with an average of 2542.6 which places Tarnave vineyard area in a warm climate zone. Concerning the precipitation, a slight increase of 34.7 mm/m^2 compared to the multiannual reference amount was monitored. In these conditions the warming of the climate induced an earlier budburst with an average of 8 days, correlated with an earlier maturation with 9-11 days in average. So far for the blooming and veraison phenophases starting date, no differences of the outrunning were clearly observed.

Key words*: grapevine phenophases, Tarnave vineyard, climatic parameters, climate change.*

PRODUCTION COSTS FOR THE CULTIVATION AND HARVESTING OF TABLE GRAPES UNDER CONDITIONS OF SOUTH-CENTRAL BULGARIA

Boyan STALEV[1], Lyudmil ANGELOV[1], Anelia POPOVA[1], Nevena SHULEVA[2]

[1]Agricultural University - Plovdiv, 12 Mendeleev Blvd, Plovdiv, Bulgaria
[2] University of Forestry, 10 Sveti Kliment Ohridski Blvd, Sofia, Bulgaria

Corresponding author email: stalev26@abv.bg

Abstract

The production and supply of table grapes is becoming an increasing challenge for grape growers and processors. The reasons are complex - from increased competitive pressure and requirements of retail market in terms of environmental production and certification of products according GLOBAL GAP criteria, to intense climate changes, which is a major factor during the growing season. This gives grounds to deepen research in the field of economic analysis in connection with use of good practices in the choice of technology for growing vines and refining work processes during the growing season, reducing pesticide usage and increasing the investment efficiency and sustainability.

Key words*: Bulgaria, economic efficiency, global gap, production costs, table grapes.*

COMPARATIVE BEHAVIOR OF VOLATILE AND AROMATIC COMPOUNDS OF TAMAIOASA ROMANEASCA AND MUSCAT OTTONEL GRAPE MARCS FERMENTED DURING TRADITIONAL STILL DISTILLATION

Felicia STOICA, Constantin BĂDUCĂ CÎMPEANU, Daniela Doloris CICHI

University of Craiova, Faculty of Horticulture, 13 A. I. Cuza Street, Craiova, Romania

Corresponding author email: feliciastoica@yahoo.com

Abstract

The demanding requirements of consumers in recent years and the desire of domestic producers to export as much as possible to European Union countries, make issues related to the quality, safety and authenticity of alcoholic beverages increasingly of concern for Romanian producers. To investigate the behaviour of volatile compounds during a traditional alembic distillation, large numbers of important volatile compounds were identified and quantified by GC/MS analysis in different fractions (one of Head, three of Heart and one of Tail) of grape marc distillates made from two aromatic varieties Tămâioasă românească and Muscat Ottonel. Monoterpenes were confirmed to be responsible for a typical Muscat aroma, as well as for descriptors such as flowery, rose and spicy/menthol in distillates made from Muscat varieties. Due to the abundance of volatile terpene compounds, it has been considered beneficial to use the tail fraction as a raw material for re-distillation.

Key words*: grape marc, distillation fractions, traditional alembic distillation, volatile and aromatic compounds, GC/MS.*

IDENTIFICATION OF SOME GRAPEVINE GERMPLASM FROM ALBA COUNTY, FOR AUTHENTIC BY-PRODUCTS ACHIEVEMENT, UNDER MINIMUM TECHNOLOGICAL INTERVENTION

Mirela STĂNUŞ (RUJOIU), Alina Georgeta DOBREI, Eleonora NISTOR, Alin DOBREI

Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara, Calea Aradului 119, Timisoara, Romania

Corresponding author email: ghitaalina@yahoo.com

Abstract

The research was carried out during 2020 and 2021 growing seasons to identify local varieties and biotypes of vines from the backyards, gardens, or small vineyards of amateur winemakers, for high quality traditional by-products, by using low costs technology. During the research, 12 local varieties and biotypes were identified, less or almost unknown, which were grouped by grape yield and analyzed compared to control varieties of very well known and widespread in the area. The phenology was observed, in order to identify varieties with late budding or flowering, with lower risks of climate variability. The ampelographic indicators, the quality of production, resistance to diseases and pests and last but not least, the grapevine management and certain economic indicators were also investigated. The research results show that, the varieties Pleoapa, Vechi de Ighiu, Izabela de Ighiu, Şard and Ruginiu de Alba are viable alternatives that can be introduced in the varietal assortments of the area. Almost all local varieties and biotypes, yielded quality grapes and registered higher economic indicators, and therefore are an alternative to the most recognized varieties which need modern management and technologies, which is more and more difficult nowadays when manual labour is difficult to find. Due to their resistance to diseases and pests, some varieties and local biotypes (Butuc Alb, Vechi de Ighiu, Ruginiu de Alba, Busuioaca de Ighiu) are also viable for organic viticulture, which have an ascending trend in Romania, which provide pollution mitigation, low inputs and healthy wine by- products, with favourable impact on the human body.

Key words*: local varieties and biotypes, sustainable viticulture, minimal viticultural technologies.*

MINIMUM QUALITY CHANGES AND WEIGHT LOSS OF TABLE GRAPES PROCESSED DURING STORAGE

Marinela STROE[1], Ioana CĂTUNEANU[2]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Marasti Blvd, District 1, Bucharest, Romania
[2]Research Center for Studies of Food Quality and Agricultural Products, 59 Marasti Blvd, District 1, Bucharest, Romania

Corresponding author email: marinelastroe@yahoo.com

Abstract

To carry out this study, we started from the scientific argument that, after harvest, table grapes undergo a series of physico-chemical changes influenced mainly by the method of storage and its duration. During the cooling and the storage of the fruits, all the physiological processes continue to take place, but with reduced intensities compared to the previous stages of fruit growth and maturation, and the phytosanitary conditions of the grapes directly influence the shelf life of the fruits. The obtained results show that the samples from the variant with CO2 - 5 % registered lower weight losses during storage, and in terms of taste, more balanced. The practical outcomes of these results can be transferred to the grape vine - growing companies cultivating table varieties, but also to economic operators in the capitalization and retail chain who will be able to use the combination of different parameters (temperature, relative humidity and different fractions of CO2, N2, O2) in order to increase the shelf life and ensure quality products for consumers.

Key words*: cultivars, quality, postharvest, storage, table grapes.*

CURRENT PEDOLOGICAL STUDIES IN THE VINEYARD DRĂGĂŞANI IN RELATION TO THE EXISTING CLIMATE CONDITIONS

Bogdan Ion TRUŞCĂ, Sergiu-Ştefan GORJAN

Research and Development Station for Viticulture and Vinification Drăgășani,
64 King Ferdinand Blvd, Zip Code: 245700, Drăgășani,
Vâlcea, Romania

Corresponding author: truscaionbogdan@yahoo.com

Abstract

In the year 2020, a soil study was carried out in the Drăgăşani vineyard, following the natural fertility of the soil, humus, content in mobile forms of phosphorus and content in mobile forms of potassium, in order to behave some varieties of vines at the moment, in parallel to the influence of climatic conditions. The rational system of soil fertilization of vineyards is largely determined by the existing soil and climatic conditions in the area. Organic fertilizers, green manures, so necessary for heavy soils, will be promoted. Among the chemical fertilizers, slow-acting fertilizers will be preferred to reduce the risk of leaching and pollution. The soil samples collected were analyzed at the Agrochemistry Laboratory of IC-DVV Valea Călugărească, in accordance with the methods provided in the "Methodology for elaboration of agropedological studies" elaborated by IC-DVV Valea Călugărească.

Keywords: *fertility, fertilizers, samples, soil, chemical analyzed.*

THE INFLUENCE OF WATER STRESS GRAPEVINE UNDERSTANDING THE PLANT'S RESPONSE FROM LEAF TO WHOLE PLANT

Andrei TANASE[1, 2], Adrian ASANICA[2], Dorin SUMEDREA[1], Anca ONACHE[1], Alina FLOREA[1]

[1]National Research and Development Institute for Biotechnology in Horticulture Stefanesti - Arges, Bucuresti-Pitesti Street, No 37, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Marasti Blvd, District 1, Bucharest, Romania

Corresponding author email: andrei.tanase1990@yahoo.com

Abstract

Of all the fruit crops of horticultural importance, the grapevine (Vitis vinifera L.) stands out as the most tolerant drought. However, there is relatively little information on grapevine responses to water stress tolerance. Climate change is probably the most discussed issue today. Climate change includes uneven distribution of regional water, extreme weather events (heat waves, heavy rains, hail, frost, and strong winds), and increasing droughts. This analysis summarizes the latest results on grapevine drought responses, the impact of water scarcity on the physiology of the grapevine and its fruit, and highlight some potential solutions in brief and medium-term in grapevine plantations.

Key words*: water deficit, Vitis vinifera L, viticulture, drought.*

THE DIVERSITY OF INSECT SPECIES AT GROUND LEVEL IN THE ȘTEFĂNEȘTI VITICULTURAL CENTER

Diana Elena VIZITIU[1], Andrei TIȚA[1], Ionela-Daniela SĂRDĂRESCU[1], Dorin Ioan SUMEDREA[1], Liliana Lucia TOMOIAGĂ[2]

[1]National Research and Development Institute for Biotechnology in Horticulture Stefanesti - Arges, Romania
[2]Research Station for Viticulture and Enology Blaj (SCDVV Blaj), 515400, Blaj, Romania

Corresponding author email: vizitiud@yahoo.com

Abstract

The paper aimed to present the evolution of the insect that were active on the ground surface during the 2020-2021 period collected from 3 plantations from the Stefanesti viticultural center. By the end of the study, 37 species of insects caught in pitfall traps had been identified. Of these, in 2020, 20 species with a total of 2429 individuals were collected and in 2021, 28 species with a total of 395 individuals. Of all the species identified, only 11 are repeated in both years. The data obtained were processed using the BioDiversity Professional 2 program. Thus, were calculated: Rarefaction, Simpson index, Shannon index, SHE analysis and Bray - Curtis analysis. The insect species identified in the period 2021-2022 did not cause damage in the monitored vineyards.

Key words*: biodiversity, grapevine, pests, arthropod, Lasius.*

VEGETABLE GROWING

SURVEY ON CONSUMERS PREFERENCE IN THE NEW ACCLIMATIZED SPECIE IN ROMANIA: *BENINCASA HISPIDA*

Ovidia Loredana AGAPIE[1], Costel VÎNĂTORU[2], Elena BARCANU[1], Bianca Elena TĂNASE[2], Ion GHERASE[1], Georgiana DOBRE[1]

[1]Vegetable Research and Development Station Buzău, 23 Mesteacănului Street, zip code 120024, Buzău, Romania
[2]Plant Genetic Resources Bank - for Vegetables, Floricultural, Aromatic and Medicinal Plants Buzău, 56 Nicolae Bălcescu Bldv, Buzău, Romania

Corresponding author email: dobre.ovidia@yahoo.com

Abstract

In the climate change scenario, growing adequate food is a major challenge for food security. To provide food to the population, introduction of new vegetable crops and extending newer assortments are important tasks of breeding programs. One of the recently acclimatized species in Romania by VRDS Buzau is Benincasa hispida, a multi-purpose and nutritious vegetable. In this study, a consumers preference survey was conducted to inform local smallholder farmers, traders and other stakeholders on opportunities for expanding production and commercialization of Benincasa hispida. Three genotypes of wax guard, G1, G2, G3 were taken into study. Data was collected from 57 participants aged between 16 and over 45 years from urban and rural areas. Results indicated that 43 participants were interested to eat the fruit due to its nutritional properties. Consumers are also interested in growing winter melon because this crop is easy to grow. Of the three genotypes tasted, G1 was preferred by participants, followed by G3 and G2. G1 variety was registered in the Official Catalogue of Romanian Crop Plants, under the name of Zefir.

Key words*: breeding, climate change, winter melon.*

THE EFFECT OF FERTILIZATION WITH AZOTOBACTER AND SHAMPLAN (*CERATOPHYLLUM DEMERSUM* L.) ON GROWTH PARAMETERS OF EGGPLANT (*SOLANUM MELONGENA* L.)

Mansoor Abed ABOOHANAH, Jamal Ahmed Abbass SALMAN, Laith Jaafar Hussein HNOOSH

University of Kufa, Faculty of Agriculture, KUFA, Iraq

Corresponding author email: jamal.selman@uokufa.edu.iq

Abstract

Field experiment was conducted in a farm of Najaf governorate during 2018-2019 season, to study the effect of different concentrations of Azotobacter and hornwort on growth parameters of Eggplant (Solanum melongena L.). The experiment included 6 treatments concerning in three different concentrations of Azotobacter (0, 5 and 10 g·100 ml^{-1} d·w) and two levels of hornwort (0 and 5 T·Ha^{-1}).

The use of Azotobacter had an increasing effect with concentration 10 g·100 ml $^{-1}$ on all vegetative growth parameters and carbohydrate (plant length, leaves number, shoot dry weight, stem diameter, total chlorophyll in leaves and total soluble carbohydrate in leaves) compared with control treatment (sprays with distilled water) which gave the least means values. Interaction between factors reveal a significant effect in all vegetative growth parameters and carbohydrate.

Hornwort addition with level 5 T·Ha^{-1} had a significant effect on all vegetative growth parameters compared with the control treatment. Interaction between two factors gave a significant effect on all vegetative growth and carbohydrate.

10 g·100 ml^{-1} of Azotobacter had a significant effect on all fruit growth parameters (fruit numbers, diameter and length) compared with control treatment which gave the least means. Hornwort addition with level 5 T·Ha^{-1} had a significant effect on all fruit growth parameters compared with control treatment. Interaction between two factors gave a significant effect on all fruit growth parameters.

Key words*: eggplant, Azotobacter, hornwort.*

RESPONSE OF SOME VEGETATIVE INDICATORS OF FABA BEANS TO ORGANIC RESIDUE SOLUTION AND SPRAYING WITH PROLINE

Nasser Jubair Radhi ALHASNAWI, Ammar Sami Al-BAYATI, Laith Jaafar Hussein HNOOSH

University of Kufa, Faculty of Agriculture, KUFA, Iraq

Corresponding author email: ammar.albayati@uokufa.edu.iq

Abstract

An experiment was conducted during the fall season of 2020 in one of the protected facilities (plastic house) in the Faculty of Agriculture, University of Kufa/Iraq. This research aimed to study the effect of applying three types of decomposing organic residue solution to soil (cow, sheep, and chicken), and foliar spraying of proline with three concentrations (0, 40 and 80) mg·L^{-1} on some indicators of the vegetative growth of a local variety of faba bean. A factorial experiment was conducted according to R.C.B.D with three replications. The results revealed significant effects of organic residue solution of chicken for plant height 46.03 cm, leaf number 26.10 (leaf·plant^{-1}), branch number 4.32 (branch·plant^{-1}), and chlorophyll content 44.04 (SPAD unit) in comparison with cow residue solution. Moreover, spraying with proline at 80 mg·L^{-1} realized a significant increase in leaf number 25.96 (leaf·plant^{-1}), branch number 3.73 (branch·plant^{-1}), and relative chlorophyll content 34.68 (SPAD unit) compared to the control treatment. Consequently, the combination of the two factors was the most efficient treatment for faba bean plant growth indicators studied aforementioned.

Key words*: Faba bean, Organic residues, Proline, Vegetative growth.*

REVIEW ON THE POSITIVE INFLUENCE OF INTERCROPPING SYSTEMS FOR ORGANIC VEGETABLE GROWING

Dan-Ioan AVASILOAIEI, Mariana CALARA, Mihaela-Carmina BENCHEA, Tina Oana CRISTEA

Vegetable Research and Development Station Bacău, 220 Calea Bârladului Street, Bacău, Romania

Corresponding author email: avasiloaiei_dan_ioan@yahoo.com

Abstract

Intercropping is considered to be a fundamental tool for ensuring agricultural sustainability and productivity, a matter of major importance in the specific context of the last decades and, mainly, the last two years.
Within European agriculture, conventional advantages of intercropping system following laborious experiments were disregarded by farmers because of the justified goal of maximizig profits using affordable pesticides on the market. This determines farmers to focus on increasing the size of their farms, replacing manual labor with a mechanized one, resulting a technological specialization of a few crops at the expense of biodiversity.
However, nowadays, following the Covid-19 pandemic and the entire chain of effects it generated, agriculture was directly affected due to the limitation of worldwide transport amplitude and the scarcity of products and raw materials that arose, the price for some of them becoming trully prohibitive (to be seen the case of chemical fertilizers at the end of year 2021).
The present paper aims to highligh some paramount matters of using intercropping systems in vegetable crop practice, regarding the perspective of soil, environment, ecosystem biodiversity and economical sustainability.

Key words*: intercropping; organic farming; environmental sustainability; GHG emissions; cover crops.*

DETERMINATION OF WATER SORPTION ISOTHERMS OF *CAPSICUM ANNUUM* L. SEEDS FERTILIZED WITH *TRICHODERMA ATROVIRIDE*

Dan Florin APOSTOL[1], MIHAELA GABRIELA DUMITRU[2], LIVIU CRISTIAN MĂRĂCINEANU[2], NICOLAE GIUGEA[2]

[1]University of Craiova, Faculty of Science, Department of Chemistry, 107 Calea Bucuresti Street, 200512, Craiova, Romania
[2]University of Craiova, Faculty of Horticulture, Department of Horticulture, 13 A.I. Cuza Street, 200858, Craiova, Romania

Corresponding author email: dan79apostol@yahoo.com

Abstract

The experiment was conducted in the laboratories of the Faculty of Chemistry and the Faculty of Horticulture of the University of Craiova.The pepper seeds were hand pick from the fruits of six varieties and a hybrid of long peppers (Capsicum annuum L.) var. longum: Bogdan, Cosmin, Doljan, Fermier, Lung de Işalniţa, Lung românescand Kaprima F1 that reached physiological maturity, cultivated in a cold solarium in an authorized private farm, fertilized with Trichoderma atroviride 0.2%.For the determination of the water sorption isotherms, the desiccator technique and the GAB (Guggenheim-Anderson-duBoer) mathematics model were used.The controlled relative humidity was achieved using saturated solutions of salts with water activity between 0.113-0.970. The obtained data were processed with the software AUR_BUILDGAB 1.0. obtaining the following value: Bogdan (m0 = 0.0479; aw =0.1574), Cosmin (m0 = 0.0447; aw =0.1136), Doljan (m0 = 0.0779; aw = 0.1756), Fermier (m0 = 0.0493; aw = 0.1462), Lung de Işalniţa (m0 = 0.0315; aw = 0.1131), Lung românesc (m0 = 0.0720; aw = 0.2077) and Kaprima F1 (m0 = 0.0388; aw = 0.1061).

Key words*: Moisture sorption isotherm, capsicum annuum.*

NUTRITIONAL COMPOSITION OF FRESH ORGANIC VEGETABLES

Andreea BARBU[1], Violeta ION[1], Mihai FRÎNCU[1], Andrei PETRE[1], Liliana BĂDULESCU[1,2]

[1]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: violeta.ion@qlab.usamv.ro

Abstract

Vegetables are important elements for rational and healthy diet due to active compounds and their nutritive values. Currently, technical progress in food industry offer new solution for processing vegetables. The purpose of this study was to determine the nutritional composition of different organic vegetables which can be used as base for healthy chips. Several vegetables (beets, carrot, sweet potato, and turnip) were purchased from organic certified farms and further analysed in terms of dry matter content, total phenolic content, antioxidant activity, and ascorbic acid. When comparing the vegetables in terms of total phenolic content and antioxidant activity, 'Detroit' beets variety registered the highest values, followed by sweet potato and turnip. The ascorbic acid content of sweet potato registered the highest values, but the 'Detroit' and 'Albino' beets varieties registered values below limit of quantification. The total phenolic content and antioxidant activity registered similar trend for all analysed samples. All studied organic vegetables can be successfully used for healthy crispy snacks. *ACKNOWLEDGEMENTS This work was supported by a grant of the University of Agronomic Sciences and Veterinary Medicine of Bucharest, project number 2021-0031/14.07.2021, acronym EcoLegDry, within IPC 2021.*

***Key words**: bioactive compounds, chips, crispy snacks, organic vegetables.*

CONSUMER PREFERENCES FOR KIWANO FRUIT, A NEWLY INTRODUCED CROP IN ROMANIA

Elena BARCANU[1], Ovidia AGAPIE[1], Ion GHERASE[1], Bianca TĂNASE[2], Georgiana DOBRE[1], Costel VÎNĂTORU[2]

[1]Vegetable Research and Development Station Buzău, 23 Mesteacănului Street, zip code 120024, Buzău, Romania
[2]Plant Genetic Resources Bank - for Vegetables, Floricultural, Aromatic and Medicinal Plants Buzău, 56 Nicolae Bălcescu Blvd, Buzău, Romania

Corresponding author email: barcanuelena@yahoo.com

Abstract

One of the main tasks of the breeding programs is introduction of new vegetables crops in order to provide vegetable diversity to the growing population. At Vegetable Research Development Station Buzau, Romania, Cucumis metuliferus has been acclimatized and today seedlings and seeds of 'Tempus' variety can be sold. Kiwano, it has multiple health benefits and plays an important role in supporting diverse and nutritious diets. But the fruit is not well known and is underutilised, due to the lack of promotion. Hence, the goal of this study was to investigate the consumer preference and also to popularize the fruit to a large scale of people. In our survey we have investigated a number of 57 respondents, aged between 18 and over 45 years. From our results, 51 people are opened to include the kiwano fruit in their diets. Also, a percentage of 85.9% from our respondents are interested in growing the jelly melon. It can be concluded that kiwano has a great commercial potential and, aimed at certain markets, could be an excellent source of cash for small farmers.

Key words*: Cucumis metuliferus, jelly melon, nutrition, questionnaire, survey.*

THE ASSESSMENT OF SEEDLING QUALITY AIMED TO ENSURE SUSTAINABLE CABBAGE SEED PRODUCTION

Alexandru BUTE, Andreea ANTAL-TREMURICI, Daniela BOURUC, Mariana CALARA, Creola BREZEANU, Petre Marian BREZEANU

Vegetable Research and Development Station Bacău,
220 Calea Bârladului Street, Bacău, Romania

Corresponding author email: alexandru.bute@outlook.com

Abstract

Brassicaceae vegetables have been grown and consumed worldwide since ancient times and they are considered a functional food due to the presence of phytochemicals, mineral and vitamins necessary for human well-being. For this reason, species as cabbage are highly requested by consumers. At farm level, constrains related to seed production process highlight the importance of seed germination and seedling performance. The study is integrated in major research aimed to develop new modern scheme for cabbage seed production. The objective of this work was to assess seedling quality by measuring several morphological, phenological and physiological parameters with influence in performance of cabbage sustainable seedling production. The experiment was assessed on "Silviana" autumn cabbage, created at VRDS Bacau, and was conducted using a randomized complete block design with three replications. The work presents the results of germination, seedling growth dynamic, carotenes, xanthophylls and chlorophylls content as affected by different factors as variety, age and growing climate. This study reveals the importance of using qualitative seedlings during the process of seed production.

Key words*: Brassica, carotenes, xanthophylls, chlorophylls, growth.*

EVALUATION AND CONSERVATION OF GERMPLASM RESOURCES OF SOLANUM MELONGENA L. (EGGPLANTS) OWNED BY PLANT GENETIC RESOURCES BANK BUZĂU

Camelia BRATU[1], Florin STĂNICĂ[2], Costel VINATORU[1], Matilda POPESCU[1], Bianca MUŞAT[1], Geanina NEGOSANU[1], Florin BURLAN[1]

[1]Plant Genetic Resources Bank - for Vegetables, Floricultural, Aromatic and Medicinal Plants Buzău, 56 Nicolae Bălcescu Blvd, Buzău, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: cameliaboteabratu@gmail.com

Abstract

PRGB Buzau holds a valuable collection of eggplant (Solanum melongena L.) genotypes consisting of 238 genotypes. Of these, 62 genotypes are genetically stabilized, 86 genotypes are in an advanced stage of breeding, and 138 genotypes are in the segregating or recently introduced category, which are not sufficiently known in terms of character expression and stability in the progeny. In the present work, 62 genetically stabilized lines, mainly composed of local populations and old traditional varieties, were studied. During the growing period phenological, biometric observations and laboratory analyses were made using UPOV and IGPRI guidelines. Regarding productivity and resistance to the main pathogens, especially Verticillium wilt, it was found that the old local populations were the most vigorous and productive. The research was completed with the recording of data regarding the genotypic and phenotypic expressivity specific to each cultivar, regeneration of the seed stock that will be directed to controlled atmosphere storage cells, and a part will be directed to research units, education, gene banks and farmers, for multiplication and technological transfer.

Key words*: local population, variety, cultivar, genotype, phenotype.*

EFFECTS OF ORGANIC INPUTS APPLICATION ON YIELD AND QUALITATIVE PARAMETERS OF TOMATOES AND PEPPERS

Petre Marian BREZEANU, Creola BREZEANU, Andreea ANTAL TREMURICI, Silvica AMBĂRUŞ, Alexandru BUTE

Vegetable Research and Development Station Bacău,
220 Calea Bârladului Street, Bacău, Romania

Corresponding author email: creola.brezeanu@yahoo.com

Abstract

The new regulation of organic cultivation starting 2022, and The Action plan for organic production in the EU, have as main aim the extinction of organically cultivated surfaces and to ensure trackability of products in a manner that will allow the significant decrease of the negative agricultural impact on environment and in human health. Due to the restrictions on organic foods, not many inputs as fertilizers or growth promoters are available for organic vegetable application. Products of natural origin are used in horticultural crops as a stimulator of the growth and development of plants. The present study was conducted in frame of a project developed in ADER program. In frame of the project research aims to identify, evaluate, tase, develop and validate methods for the analysis of nutrients and contaminants from inputs usable in organic farming. The project strategy includes application of two organic inputs in condition of certified organic field at SCDL Bacau on three important vegetable species: tomatoes, peppers, and cucumbers. The work presents the developed protocols in terms of application to highlight the potential of products to enhance quality and yield parameters, for two of three species, namely solanaceous. Assessment of total dry matter, total soluble solids, carotenes, lycopene, chlorophylls, and xanthophylls content and yield potential were accomplished. Application of these inputs may contribute to enhanced growth, yield, and resistance against specific pathogens, as well as the positive impact of content and activity of certain bioactive compounds.

Key words*: solanaceous, vegetables, ecological inputs, quality.*

LOPHANTUS ANISATUS USED AS DRIED AROMATIC INGREDIENT

Monica Luminiţa BADEA[1], Violeta Alexandra ION[2], Andreea BARBU[2], Andrei PETRE[2], Mihai FRÎNCU[2], Viorica LAGUNOVSCHI-LUCHIAN[1], Liliana BĂDULESCU[1, 2]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: violeta.ion@qlab.usamv.ro

Abstract

Lophantus anisatus Nett. belongs to the Lamiaceae (Labiatae) family, and it is an aromatic, medicinal and honey plant. Due to its high content of substances with nutritional and sensory value, the powder obtained from the naturally dried plants can be used as aromatic and nutraceutic ingredients for vegetable chips. In addition to its sensory quality, this powder also stands out by having high antioxidant activity, with beneficial effects on the human body. The aim of this study was to obtain fine powder from natural dried lophantus leaves, which can be further used as aromatic ingredient. The lophantus powder was characterized in terms of dry matter content, total polyphenols, antioxidant activity using DPPH method, ascorbic acid, total pigments, and volatile compounds. The main compounds identified in the volatile oil were: methyl chavicole, methyleugenol, caryophyllene, and germacrene D.
ACKNOWLEDGEMENTS: This work was supported by a grant of the University of Agronomic Sciences and Veterinary Medicine of Bucharest, project number 2021-0031/14.07.2021, acronym EcoLegDry, within IPC 2021.

***Key words**: aromatic ingredients, bioactive compounds, natural drying, powder.*

EFFECT OF FOLIAR APPLICATION OF BIOSTIMULANTS ON PRODUCTIVE EFFICIENCY OF SOME GARDEN PEAS VARIETIES

Alexandra BECHERESCU[1], Olimpia IORDĂNESCU[1], Maria DINU[2], Maria BĂLA[1], Anca DRĂGUNESCU[1], Daniel POPA[1]

[1]Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timișoara, Calea Aradului 119, Timișoara, Romania
[2]University of Craiova, Faculty of Horticulture, 13 A. I. Cuza Street, Craiova, Romania

Corresponding author email: popadaniel67@yahoo.com

Abstract

The utilization in human nutrition of leguminous pods and green beans, of the oil extracted from seeds in various meals, in animal feeding, in industry and agriculture to increase fertility, confers to these leguminous great importance. The assimilable protein from leguminous seeds represent 24-47% (peas 28%, soy 40%), compared to wheat (12%). Such protein, in various forms, participates to the exteriorization of live matter's essential characters, namely self-reproduction, variability and heredity. The proteins from leguminous plants are equivalent with those of animal origin from meat, milk, eggs, having a digestibility of over 90%. Due to the fact that they do not form uric fatty acids within the organism, which cause diseases like rheumatism and gout, they are superior to meat. The seeds of leguminous plants also contain carbohydrates, vitamins, mineral salts, ferments and fats. Due to these extremely positive features, and implicitly to their utilization in the fields mentioned, this work presents the experimental results on the improvement of crop technology in garden peas, which finally will determine the increase of productive and quality efficiency.

Key words*: plant, protein, seeds, technology, efficiency, pods, green beans.*

THE EFFECT OF FERTILIZATION REGIME ON EGGPLANT CROPS UNDER GREENHOUSE

Anamaria CIUBOTĂRIȚA, Vasile STOLERU, Gabriel-Ciprian TELIBAN, Alexandru COJOCARU, Alexandru HORAICU

"Ion Ionescu de la Brad" Iași University of Life Sciences,
3rd Mihail Sadoveanu Alley, Iasi, Romania

Corresponding author email: vstoleru@uaiasi.ro

Abstract

Eggplants (Solanum melongena L.*) have become in the last years one of the most appreciated vegetables worldwide due to their high nutritional value. Eggplant fruits contain significant amounts of carbohydrates, mineral salts, vitamins and polyphenols. In order to increase productive potential of eggplant, it is necessary to ensure the optimal level for all the environmental factors as well as the specific technological ones. Soil is the main source of mineral nutrients and water for plants, its ability to provide the needed nutrients varies depending on its level of fertility. Eggplant fruit quality is determined by nutrients quantity and quality. In addition, at the University of Life Sciences from Iasi, an experiment was carried out during 2020-2021 growth season with the purpose to investigate the effect of three different fertilization regimes on the fruit quality and fruit yield and its component of eggplant cultivar Mirval F1 and Bleach Pearl F1 under tunnels. The research indicated significant values in terms of quality and quantity for the microbiologically fertilized Mirval hybrid.*

Key words*: biometrical indicators, cultivars, differentiated fertilizers, eggplant, polytunnels.*

REVIEW ON IMPROVING TOMATO CULTURE TECHNOLOGY IN PROTECTED SYSTEM FOR ENVIRONMENTAL PROTECTION AND INCREASING PRODUCTIVITY USING PGPR

Claudia-Loredana DRAGOMIR, Dorel HOZA

University of Agronomic Sciences and Veterinary Medicine of Bucharest,
59 Marasti Blvd, District 1, Bucharest, Romania

Corresponding author email: dragomir_claudia95@yahoo.com

Abstract

Tomato (Solanum lycopersicum L.) is one of the world's most prolific vegetables. Researchers are still looking for solutions to improve crop technology using plant protection and stimulation products that are neither harmful to the environment or the plants they treat. Many technologies for cultivating and treating plants with Bacillus spp. have been developed. For this reason, we analyzed the influence of PGPR on two tomato hybrids Cocete F1 and Nissos F1 in the greenhouse. The results showed that there weren't considerable differences in the quantitative characteristics of plant studied. Regarding stem thickness, the variants had values between 0.5 cm and 0.7 cm. The number of leaves was 16.8 = F1 Cocete 15.9 = F1 Cocete+PGPR, 16.6 = Nissos F1, 16.5 = Nissos F1 + PGPR). The plants height for Cocete F1 was 193.1 cm and 188.1 cm for Cocete F1 + PGPR, while for Nissos F1, the plants had 218.9 cm and 211.3 for Nissos F1 + PGPR. In terms of inflorescences number, Cocete F1 recorded 6.4 and 5.7 for Cocete F1 + PGPR whereas Nissos F1 had 5.1 and Nissos F1 + PGPR 4.9. Referring to the flowers number, the hybrid Cocete F1 in both variants registered similar values (30 flowers/plant) but Nissos F1, Nissos F1 + PGPR had 24.8 and 26.7, respectively. The number of fruits per plant was 14.8 for Cocete F1 while other variants produced 16 fruits/plant.

Key words*: biologic, tomatoes, bacteria, PGPR.*

THE COMBINED EFFECT OF TEMPERATURE AND LIGHT VARIATION ON SOME QUALITY PARAMETERS IN CHERRY TOMATOES

Elena Maria DRĂGHICI[1], Liliana BĂDULESCU[1, 2], Ionuţ Ovidiu JERCA[2]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: draghiciem@yahoo.com

Abstract

The study was conducted under controlled conditions in a greenhouse during a crop cycle during September-April. The culture was established on a coconut substrate. All parameters of vegetation, temperature, light, humidity, carbon dioxide content in the greenhouse were monitored. Fruit mass determinations were performed on each inflorescence, as well as carbohydrate and nitrate content. The production obtained by fruiting stages was determined as well as the total production. The aim of the study was to analyze the influence of some parameters of growth and fruiting on the total production and its quality.

Key words*: greenhouse, tomatoes, soilless, production.*

THE INFLUENCE OF THE CLIMATIC CONDITIONS IN THE GREENHOUSE AND OF THE CULTURE SUBSTRATE, ON SOME PARAMETERS OF TOMATO GROWTH

Elena Maria DRĂGHICI[1], Liliana BADULESCU[1, 2], Ionuţ Ovidiu JERCA[2]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: draghiciem@yahoo.com

Abstract

The study was carried out in the Hortinvest greenhouses, the Research Center for quality control of horticultural products, USAMV Bucharest, on a tomato crop established in an unconventional system on two types of substrate, perlite and coconut. The effects of temperature on the growth, development and yield of tomato crop (Lycopersicon esculentum) were correlated with the type of substrate. The observations made on the tomato plants led to the conclusion that the temperatures below the optimal parameters determined the formation of some leaves with a larger leaf area to the detriment of fruiting. Also, the total vegetative mass was different. The aim of the study was to identify the effect of temperature variations on the vegetative mass formed, and tomato production.

Key words*: greenhouse, temperature, tomatoes, soilless, production.*

ECOLOGICAL DIVERSITY OF THE EPIGEAL INVERTEBRATE FAUNA FROM AN EXPERIMENTAL BELL PEPPER CROP AT SCDL BUZĂU - ROMANIA

Ioana FLORESCU, Traian MANOLE, Constantina CHIRECEANU

Research-Development Institute for Plant Protection Bucharest,
8 Ion Ionescu de la Brad Blvd, 013813, Bucharest, Romania

Corresponding author email: ioanaflorescu94@yahoo.com

Abstract

Ecological diversity is an important parameter in assessing the state of an ecological system. This paper presents the results of a study conducted in 2019-2020 on the abundance and ecological diversity of useful and harmful insect communities from an experimental crop of bell pepper organized at the Research-Development Station for Vegetable Growing Buzău. The experiment included five variants in four replications disposed in completed randomized block, untreated, diatomite in three doses (52.5 g, 105 g, 210 g) and Trichoderma asperellum Td85 strain. The diatomite is of autochthonous from the Pătârlagele deposit and the antagonistic fungus Trichoderma from the microorganism collection of the Research and Development Institute for Plant Protection Bucharest. Samples were collected every two weeks by the Barber soil trap method. Data collected in experimental crop of bell pepper under this study revealed a total of 1,455 individuals in 2019 and 1,634 in 2020, respectively, belonging to 124 species, 104 genera, 58 families, 17 orders, 8 classes and 3 phyla. The ecological diversity of present species was estimated using the diversity indexes, Margalef, Menhinick, Shannon-Wiener and Simpson.

Key words*: diatomite, pepper, soil fauna, Trichoderma.*

VISUAL SYMPTOMS DIFFERENTIATION BETWEEN CALCIUM DEFICIENCY AND PATHOGENS INFECTION IN TOMATO FRUIT

Feodor FILIPOV, Florin DANIEL LIPSA, Mihaela Andreea FLOREA, Andrei GAFENCU, Eugen ULEA

"Ion Ionescu de la Brad" University of Life Sciences Iași,
3rd Mihail Sadoveanu Alley, Iasi, Romania

Corresponding author email: flipsa@uaiasi.ro

Abstract

Interpreting visual nutrient deficiency and toxicity symptoms in plants can be difficult and plant analysis or soil testing is necessary to confirm nutrient stress. Frequently, interpreting the underlying causes of visual symptoms in plants is difficult due to the similarity of symptoms that occur as a result of pathogen attack or nutrient deficiencies (i), the occurrence of several deficiencies at the same time or the induction of the deficiency of some nutrients by an abiotic factor or by the abundance of another nutrient (ii), different ability of cultivars to adapt to nutrient deficiencies or toxicities (iii), lack of visual symptoms in some plants due to nutrient deficiency (iv), overlapping disease symptoms with those caused by nutrient deficiencies or excesses. The correct identification and differentiation of visual symptoms caused by environmental factors or by pathogens is of particular practical importance in order to correctly establish the necessary cultural measures. Frequently, in agricultural practice symptoms of calcium deficiency in tomato fruit were often confused with some infectious diseases caused by pathogens and the cultural measures applied by farmers increased only the costs of production. In this research is presented a diagram of decision support for the correct identification of calcium deficiency in tomato fruits and differentiation of other symptoms caused by common pathogens of these plants.

Key words*: visual symptomatology, calcium deficiency, plant pathogen, tomato fruit, diagram of decision support.*

PHYSICO-CHEMICAL PROPERTIES OF TWO CHERRY TOMATO VARIETIES IN RELATION TO THE GREENHOUSE ENVIRONMENTAL FACTORS

Mihai FRANGULEA[1], Liliana BĂDULESCU[1, 2], Ovidiu Ionuț JERCA[1], Elena Maria DRĂGHICI[2], Michael BANTLE[3], Sigurd SANNAN[3], August BRÆKKEN[3], Sorin Mihai CÎMPEANU[2]

[1]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[3]SINTEF, Strindvegen 4, Trondheim, Norway

Corresponding author email: m.frangulea@gmail.com

Abstract

To prevail on the agricultural market, greenhouse grown cherry tomatoes need to meet certain quality standards. The quality can be assessed by determining several chemical and physical characteristics. The aim of the current study is to analyse such parameters of two tomato varieties (Flaviola and Cheramy F1) in relation to their flowering stage and to the growing conditions within the greenhouse: air temperature, relative humidity and CO2 concentration. The soluble solids, titratable acidity and dry matter were determined. Furthermore, β-carotene, lycopene, mineral and ascorbic acid contents were analysed. Tomato fruit size and firmness were also assessed. The importance of controlling the greenhouse climatic conditions was demonstrated through the findings of the study. Therefore, for both chemical and physical characteristics, results indicated optimal values for most parameters. The environmental factors which registered values outside the favorable range influenced quality, suboptimal values being reached for certain parameters. It can be concluded that tomato fruit quality is dependent on several key factors, among which the greenhouse climatic conditions.

Key words*: cherry tomato, greenhouse, fruit quality, physico-chemical.*

STUDIES REGARDING YIELD POTENTIAL OF SOME GARDEN PEAS ACCESSIONS SOWN IN DIFFERENT DECADES

Ion GHERASE[1], Elena BARCANU[1], Ovidia-Loredana AGAPIE[1], Bianca-Elena TĂNASE[2], Costel VÎNĂTORU[2], Elena Maria DRĂGHICI[3]

[1]Vegetable Research and Development Station Buzău, 23 Mesteacănului Street, zip code 120024, Buzău, Romania
[2]Plant Genetic Resources Bank - for Vegetables, Floricultural, Aromatic and Medicinal Plants Buzău, 56 Nicolae Bălcescu Blvd, Buzău, Romania
[3]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: ion2196@yahoo.com

Abstract

Pisum sativum also known as garden peas is one of the major food legumes that can grow in different regions, and it ranks the fourth in world food legume productions next to soybean, peanut, and dry bean. At Vegetable Research Development Station Buzau, a new breeding program of peas has started and 15 stable accessions were taken into study. The focus of the present study was to evaluated the yield potential and the best suited sown decade for 15 peas accessions. The crops were severely affected by excessive rainfall, (in May and June) which however, it was found that the accessions sown in the first decade had higher yields compared to the accessions in the second decade, both at green peas maturity and at physiological maturity. Thus, the lowest value for weight of 1000 grains was at A11 with 212.04 g, and the highest was obtained by A1 with 455.25 g. In terms of yield potential, it was noted that A8 had the lowest value/sqm (102.01 g), and A10 was the accession with the highest weight/sqm (295.53 g), at physiological maturity. A9 was the earliest accession, followed by A1, and the latest accessions were A6 and A7.

Key words*: expressiveness, Pisum sativum, phenotype.*

SECRETARY TISSUES AND COMPOSITION OF VOLATILE OIL ON THE SPECIES *OCIMUM BASILICUM* (LAMIACEAE) CULTIVATED IN NFT SYSTE

Elena Alina GOVOREANU[1], Violeta ION[2], Vlad POPA[2], Elena SAVULESCU[1], Monica Luminița BADEA[1], Elena Maria DRĂGHICI[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Marasti Blvd, District 1, Bucharest, Romania
[2]Research Center for Studies of Food Quality and Agricultural Products, University of AgronomicSciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, România

Corresponding author email: draghiciem@yahoo.com

Abstract

The species Ocimum basilicum belongs to the Lamiaceae family, it is an aromatic and medicinal plant with uses in various industries. The plants studied (Aromat de Buzău and Crispum) were grown in the greenhouses of the Research Center for Studies of Food Quality and Agricultural Products. The plants were analyzed fresh during flowering. At the level of the leaves, glandular hairs were found in both epidermis (upper and lower) identified by the Inspect S50 scanning electron microscope. The oil has been extracted by hydro distillation and analyzed by gas chromatography – mass spectrometry (GC-MS). The majority of the chemical compounds common to the two cultivars (Aromat de Buzău and Crispum) were linalool (17.10 % respectively 26.94%) and methyl chavicol (63.56 % respectively 18.42 %).

Key words*: Ocimum basilicum L. SECRETARY TISSUES, volatile oil, cultivation, NFT system.*

ANATOMICAL AND BIOCHEMICAL RESEARCH ON THE SPECIES *OCIMUM BASILICUM* L. (LAMIACEAE) CULTIVATED IN THE NUTRIENT FILM TECHNIQUE SYSTEM

Elena Alina GOVOREANU[1], Violeta ION[2], Elena SĂVULESCU[1], Monica Luminița BADEA[1], Vlad POPA[2], Elena Maria DRĂGHICI[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Marasti Blvd, District 1, Bucharest, Romania
[2]Research Center for Studies of Food Quality and Agricultural Products, University of AgronomicSciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, România

Corresponding author email: draghiciem@yahoo.com

Abstract

The article presents aspects regarding the anatomy and composition of volatile oil in the species Ocimum basilicum L. cultivar Aromat de Buzău (Lamiaceae). Anatomical observations were made on cross-sections in the stems and lamina of the leaf. The epidermis of the leaf is unilayered, with the outer walls covered by a thin cuticle. Glandular and nonglandular hairs are present on both epidermis, especially on the lower epidermis. There are short glandular hairs, capitate or peltate and the non-glandular ones are unicellular or multicellular, sharp or with a curved tip. The stomata are present in both epidermis but more numerous in the lower epidermis, being of the diacytic type. The leaf mesophylle is bifacial with palisade tissue under the upper epidermis consisting of a single row of elongated cells, rich in chloroplasts and spongy tissue, below the lower epidermis, consisting of 3-4 rows of ovoid cells and with intercellular spaces. The oil has been extracted during the flowering period, by hydro distillation and analyzed by gas chromatography - mass spectrometry (GC-MS). The main chemical compounds present in the volatile oil were: methyl chavicol (63.56%), linalool 17.10%, 1.8 cineole 4.01%, α-epi-cadinol 2.64%.

Key words*: Ocimum, anatomy, secretory hairs, oil volatile, linalool.*

COMPARATIVE RESEARCH ON NEW TOMATO HYBRIDS FOR SPRING CULTURE IN SOLARIUM

Gheorghița HOZA[1], Maria DINU[2], Alexandra BECHERESCU[3], Rodica SOARE[2], Tobias GRADINARU[1].

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, Faculty of Horticulture, 59 Marasti Blvd, Bucharest, Romania
[2]University of Craiova, 13 Alexandru Ioan Cuza Street, Craiova, Romania
[3]Banat University of Agricultural Sciences and Veterinary Medicine "King Mihai I of România" from Timisoara, 119 Aradului Street, Timișoara, Romania

Corresponding author email: alexandra_becherescu@yahoo.com

Abstract

The research was made with a tomato spring culture, in solarium, in 2016 and 2017, in Fierbintii de Jos village, Ialomita county, on an area of 2000 m^2. Four new tomato hybrids were used respectively Zadurella F1, Matissimo F1, Yigido F1 and SV 4224 TH F1. The tips of the main stems were removed at four inflorescences and the layout of the experiment was made in randomized blocks with three repetitions. The tomatoes were cultivated on a soil with neutral pH, with an optimal content of ammonium nitrate and average content of nitric nitrogen, phosphorus, organic matter, calcium, sodium and soluble salts, with very low content of potassium and very high of magnesium. The main fertilization was made through applying 30t/ha of organic fertilizers while preparing the soil. During the vegetation period the fertilization was phasial with products from the Tecamin brand, appropriate for each phenophase in part. The results obtained proved that all hybrids used were highly productive, the commercial production per each plant being between 2.48 kg and 3.62 kg. The commercial production per m2 varied between 9.42 kg and 13.76 kg. The average fruit weight was between 167 and 214 g. All hybrids produced large, firm fruits, with a content of dry soluble substance of roughly 5%, the titratable acidity between 0.22% for Yigido F1 and 0.43 % for Zadurella F1. The fruits had a C vitamin content between 14.42 mg/100 g at Yigido F1 and 23.00 mg/100 g at Zadurella F1.

Key words*: biochemical composition, vegetative growth, protected culture, production.*

THE IMPACT OF FOLIAR FERTILIZERS ON THE PRODUCTION OF ZUCCHINI CULTIVATED IN THE FIELD

Gheorghita HOZA[1], Maria DINU[2], Alexandra BECHERESCU[3], Ionica ANTONIO[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, Bucharest, Romania
[2]University of Craiova, 13 Alexandru Ioan Cuza Street, Craiova, Romania
[3]Banat University of Agricultural Sciences and Veterinary Medicine "King Mihai I of România" from Timisoara, 119 Aradului Street, Timișoara, Romania

Corresponding author email: dinumariana@hotmail.com

Abstract

In Romania, zucchini culture is extending more and more as it is one of the vegetable cultures preferred especially by the population around larger cities, where a higher variety of produces is necessary. It is a vegetable species rich in minerals and vitamins, being prepared in different forms. For these reasons, there are concerns regarding the improvement of culture technology through the use of high quality seedling material, of foliar fertilizers with high impact on the production capacity of plants and environmentally friendly, this being also the purpose of the present research. For the research, the following were used: 3 hybrids F1, Eskenderany, Opal and Ismalia, and 3 organic fertilizers, Cropmax 0.1%, Aur verde Extra 0.1% and Bombardier 0.15%. After data processing and results interpretation, it was observed that all the hybrids that had been fertilized with Aur verde Extra 0.1% produced the best results in what concerns the number of flowers per plant. The fruit production per plant and the fruit production per square meter were higher for the F1 hybrids Eskenderany and Ismalia fertilized with Aur verde Extra 0.1%, while for Opal F1 the highest production per plant and per m2 was obtained after applying Cropmax 0.1%. The highest increase of the production per plant was obtained for all hybrids fertilized with Cropmax 0.1%, while the highest profit per m2 was obtained for Eskenderany F1 and Ismalia F1 fertilized with Aur verde Extra 0.1% and for Opal F1 fertilized with Cropmax 0.1%.

Key words*: foliar fertilizers, hybrids, production, zucchini.*

BIOLOGICAL CONTROL OF *FUSARIUM* WILT OF TOMATO BY APPLICATION OF *PENICILLIUM* SPP. AND *CHENOPODIUM MURALE*

Arshad JAVAID, Syeda Fakehha NAQVI, Amna SHOAIB, Iqra Haider KHAN

Department of Plant Pathology, Faculty of Agricultural Sciences, University of the Punjab, Lahore, Pakistan

Corresponding author email: arshad.iags@pu.edu.pk

Abstract

Fusarium wilt of tomato, caused by Fusarium oxysporum f. sp. lycopersici, is an economically important soil-borne disease of tomato especially in warmer regions of the world. Fungicides used to control this disease also pollute the environment and cause health hazards. In the present study, this disease was controlled by application of two antagonistic species of Penicillium namely P. digitatum and P. expensum, and dry biomass of a weed Chenopodium murale as soil amendments. The antagonistic fungi and different doses of dry biomass of the weed (1%, 2% and 3%) were applied in pathogen inoculated pot soil either separately or in combinations. The highest disease incidence (100%) was recorded in positive control where only fungal pathogen was applied. Different treatments of soil amendments reduced disease incidence to 3–23%. The lowest disease incidence (3%) was recorded in 2% C. murale biomass + P. expensum treatment. All the soil amendment treatments significantly enhanced shoot and root growth as well as fruit yield as compared to positive control. The highest fruit biomass was recorded in 2% C. murale biomass + P. digitatum treatment. The highest activities of peroxidase (POX), catalase (CAT) and polyphenol oxidase (PPO) were recorded in the positive control. These enzymatic activities were significantly lowered when soil was amended with antagonistic fungi or C. murale biomass. Effect was more pronounced where C. murale biomass was applied either alone or combined with Penicillium spp. This study concludes that application of 2% C. murale biomass + P. digitatum has the potential to significantly reduce Fusarium wilt of tomato and enhance tomato growth and yield.

Key words*: Biocontrol, Fusarium wilt, Nettle-leaved goosefoot, Penicillium spp., Tomato.*

EFFECT OF USING ORGANIC FERTILIZERS ON THE PRODUCTIVE PARAMETERS OF TOMATOES UNDER FIELD METEOROLOGICAL CONDITIONS

Kostadin KOSTADINOV[1], Stoyan FILIPOV[1], Nadezhda SHOPOVA[2], Radoslav CHIPILSKI[3]

[1]Agricultural University of Plovdiv, Faculty of Horticulture with Viticulture, Department of Horticulture, 12 Mendeleev Blvd, Plovdiv, Bulgaria
[2]Climate, Atmosphere and Water Research Institute at Bulgarian Academy of Sciences (CAWRI-BAS), 66, Blvd Tzarigradsko chaussee, 1784, Sofia, Bulgaria
[3]Agricultural Academy, Institute of Plant Genetic Resources, 2 Drouzhba Str., 4122, Sadovo, Plovdiv district, Sofia, Bulgaria

Corresponding author email: kostadinov8888@gmail.com

Abstract

In times of climate changes and increased demand for food purity a significant part of scientific research is directly addressed organic agriculture. The producers are increasingly orienting themselves to bio-production due to its long-run positive consequences both for human and environmental health. The role of organic production is clearly outlined in a number of papers and documents, related to the fight against climatic changes and soil and water contamination. This paper aims at answering the question of whether the biologically grown tomato variety Rugby presents a good alternative to the conventionally produced varieties with respect to their yield. The meteorological conditions during the vegetation period in 2021 have been analyzed in detail and basic productive parameters of the experimentally grown plants (number of standards and non-standard fruits; total weight in kg/da) have been compared for the two methods and three planting dates. At the first harvest in early summer, plants fertilized with mineral fertilizers NPK give better yields than unfertilized and fertilized with Arkobaleno. However, with the intensification of the unfavourable hydrothermal conditions by the end of the summer, the final total yield from the bio-fertilized plants for all the three planting dates already has better parameters not only compared to the unfertilized plants but also compared to the these grown after mineral fertilization. Biologically fertilized tomato plants show better productivity under conditions of over-wetting. Mineral fertilizers have a slight advantage in case of heat stress but the yields are comparable with those, from the plants, fed with the organic fertilizer Arkobaleno.

Key words*: yield, tomatoes, organic and mineral fertilizers, meteorological conditions.*

EFFECT OF PESTICIDES ON THE NUTRITIONAL QUALITY OF CULTIVATED SPICE PAPRIKA

Szandra KLÁTYIK[1], Roxana CICEOI[5], Gergana MLADENOVA[2], Okray OREL[3], Mária MÖRTL[4], András SZÉKÁCS[4]

[1]Agro-Environmental Research Centre, Institute of Environmental Sciences, Hungarian University of Agricultural and Life Sciences, Herman Ottó út 15, H-1022, Budapest, Hungary
[2]Faculty of Agronomy, University of Forestry, 10 Kliment Okhridsky Blvd., 1756, Sofia, Bulgaria
[3]Plant Protection Central Research Institute, Fatih Sultan Mehmet Blvd 66, 06170, Ankara, Turkey
[4]Agro-Environmental Research Centre, Institute of Environmental Sciences, Herman Ottó út 15, H-1022, Budapest, Hungary
[5]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, Bucharest, Romania

Corresponding author email: roxana.ciceoi@qlab.usamv.ro

Abstract

Spice paprika, a mix of different species and cultivars such as bell pepper and chili, is the second largest spice commodity worldwide after black pepper, both in terms of production and trade value. It plays different roles in the EU countries, being a market leading commodity in Hungary and Spain. In Hungary, maintaining the quality of spice paprika as a "Hungaricum" products is essential. Peppers have a special role in Turkish cuisine, the country ranking the third in the world for pepper production. In Romania, pepper crop ranks the fourth, after tomatoes, cabbage, and onion, in terms of production. In Bulgaria, pepper has a significant economic and socio-cultural importance, due to the favorable climate that favors pepper production. Due to the high pressure of pests, food safety aspects related to mycotoxins and pesticide residues have been raised, as well as the influence of these contaminations on the nutritional quality of spice paprika. Currently, 41 pesticide active ingredients (16 insecticides, 12 fungicides, 7 herbicides, and 7 soil disinfectants) are registered in the EU for paprika cultivation. Pesticide application can affect the quality of spice paprika via possible emergence of pesticide residues and also by affecting the bioactive component content. Thus, high dosages of pesticide treatment resulted in lowered levels of tocopherols (up to 13%) and carotenoids (up to 16%). Moreover, pesticide residues above the maximal residue level were detected in the EU in 2018-2019 in 26-30%, 5.6-6.4%, and 5.3% of the imported unprocessed chili pepper products. sweet pepper samples, and processed pepper products, respectively, and multiple residues occurred at high frequency (68%) in paprika powder. One of the aims of the European Green Deal is a 50% reduction in the use of pesticides and a 25% increase in organic agriculture by 2030. The present collaboration within the Erasmus+ Hort4EUGreen project supports the dissemination of pesticide-free and organic farming knowledge for students and interested citizens, open acces, via the hortgreen.com educational platfrom.

Key words*: spice paprika, Hungaricum, active ingredients, pesticide residues, Erasmus+ cooperation partnerships.*

EVALUATION OF THE COMBINING ABILITY OF TOMATO GENITORS OBTAINED AT PGRB BUZAU

Bianca MUȘAT[1], Dorel HOZA[2], Costel VÎNĂTORU[1], Matilda POPESCU[1], Camelia BRATU[1], Geanina NEGOȘANU[1]

[1]Plant Genetic Resources Bank - for Vegetables, Floricultural, Aromatic and Medicinal Plants Buzău, 56 Nicolae Bălcescu Blvd, Buzău, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: zamfir_b@yahoo.com

Abstract

Hybrid tomatoes are grown in more than 95% of protected areas, rather than varieties. Romania has very few indigenous hybrids of this species, which led PGRB to launch a new tomato breeding program in order to obtain hybrids in accordance with the requirements of growers and consumers, involving in this program the native germplasm collection. PGRB owns a valuable germplasm collection for this species comprising 3084 lines. Of these, 1050 have been identified as genetically stabilized genotypes, 692 as genetically advanced genotypes and 1342 segregants. A number of 33 genitors have been selected after they successfully passed the general combining ability test and showed distinct phenotypic expressiveness. These genitors were involved in specific crosses and 19 of them manifested F1 reproductive heterosis. A number of 9 hybrids outperformed both genitors and genitors mean, from which H 14 recorded the highest percentage of heterobeltiosis of 84.1%. Three hybrids recorded mean values of estimated heterosis with an average of 27.7% (H4) and a number of 7 hybrids were below both the best parent and genitors mean.

Key words*: breeding, germplasm, heterosis, hybrid, selection.*

THE INFLUENCE OF *FUSARIUM OXYSPORUM* AND *ALTERNARIA ALTERNATA* FUNGI ON VARIABILITY AND HERITABILITY OF THE TOMATO GROWTH CHARACTERISTICS

Nadejda MIHNEA, Galina LUPAŞCU, Svetlana GAVZER, Diana CLIMAUTAN

Institute of Genetics, Physiology and Plant Protection,
20 Padurii Street, MD-2002, Chisinau, Republic of Moldova

Corresponding author email: mihneanadea@yahoo.com

Abstract

As a result of the analysis of the sensitivity of the tomato perspective lines to the culture filtrates (CF) Alternaria alternata and Fusarium oxysporum, it was found that in the most of the cases they did not significantly influence seeds germination, but in all the cases, inhibition of the embryonic root length and stem occurred. By bifactorial analysis of the variance it was found that for the seeds germination, the genotypic factor was the most important in the reaction to F. oxysporum and A. alternata isolates, and for the growth of embryonic root and stem in both variants a major influence belongs to the fungus isolate. Genotypic and phenotypic variations varied to a large extent depending on the isolate and the analyzed character. High coefficient of heritability in the broad sense (h^2 = 0.60-0.95) indicates a good heredity of the studied characters in the interaction with the isolates of F. oxysporum and A. alternata fungi. We mention that the coefficient of genotypic variation varied widely – 17.8-73.1% for the studied characters, which proves the genetic and environmental nature of their variability.

Key words: *tomatoes, variability, growth organs, F. oxysporum, A. alternata.*

THE USE OF CO-CULTIVATION OF AROMATIC, MEDICINAL PLANTS AND VEGETABLES IN SUSTAINABLE URBAN HORTICULTURE

Kristina Ilectra MAKNEA[1], Adrian ASANICA[2], Claudia FABIAN[2], Adrian PETICILĂ[2], Julia Nerantzia TZORTZI[3], Dan POPESCU[2]

[1]Region of Central Macedonia (second degree of local government), 198 Vas. Olgas Avenue, Thessaloniki, Greece
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, Faculty of Horticulture, 59 Mărăști Blvd, District 1, Bucharest, Romania
[3]Politecnico di Milano, Department of Architecture, Built Environment and Construction Engineering, Via G. Ponzio 31, 20133 Milano, Italia

Corresponding author email: kristinamaknea@gmail.com

Abstract

Reliable access to safe, economic and nutritious food was at increasing risk many decades ago, burdening society and social relations, especially in urban areas. It is now known that climate change, the pandemics and the economic crisis are directly responsible for food security. For this reason, science has undertaken to safeguard the future of food. Any proposal to reduce the catastrophic effects of the climate crisis on cities must be based on ecological farming methods to achieve sustainable urban horticulture. Co-cultivation is an old forgotten cultivation method, beneficial to mankind and the environment. It can make a positive contribution to the agri-food planning of a city and to tackling the effects of climate change. A bibliographic review is carried out in the Mediterranean region concerning the co-cultivation (companion planting) of aromatic-medicinal plants and vegetables on the University premises (USAMV Bucharest). An attempt is made to evaluate the adaptability of Mediterranean plants and the evolution of their co-cultivation. The results of this research will be useful to city managers, architects, agronomists, etc. This work aims to prove through a comparative method that the use of co-cultivation is a critical factor in sustainable urban agriculture and, consequently, food security and that climate change can affect people's eating habits.

Key words*: co-cultivation, sustainable urban horticulture, food security, climate and pandemic crisis.*

PRELIMINARY STUDY REGARDING THE INFLUENCE OF NUTRIENT CONCENTRATION ON PRODUCTION AND QUALITY PARAMETERS FOR LETTUCE GROWN ON PERLITE SUBSTRATE

Daniela MICU (BALINT), Elena Maria DRĂGHICI

University of Agronomic Sciences and Veterinary Medicine of Bucharest,
59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: draghiciem@yahoo.com

Abstract

The study was carried out in the Hortinvest research greenhouse, within the Horticultural Products Quality Research Center in 2021. Two varieties of Lollo bionda and Lollo rosa lettuce were grown on mattresses filled with 4 mm granular perlite. The nutrient solution was administered in three concentrations of EC and in two types of pH. Differences were noted between the experimental variants regarding the reaction of the varieties to these treatments.

Key words*: perlite, substrate, lettuce, content nutritive solution.*

THE CONTENT OF MICROELEMENTS IN BLOOM OF BROCCOFLOWER AFTER FOLIAR FERTILIZATION

Marko PETEK[1], Ivan PETKOVIĆ[1], Sanja FABEK UHER[1], Mihaela ŠATVAR VRBANČIĆ[1], Tomaš LOŠÁK[2], Vjekoslav TANASKOVIC[3], Tomislav KARAŽIJA[1]

[1]University of Zagreb, Faculty of Agriculture, Svetošimunska cesta 25, Zagreb, Croatia
[2]Faculty of Regional Development and International Studies, Zemědělská 1/1665, Brno, Czech Republic
[3]Faculty of Agricultural Sciences and Food, 16th Macedonian Brigade No.3, Skopje, North Macedonia

Corresponding author email: sfabek@agr.hr

Abstract

World market of vegetables is becoming less conservative and has been opening itself to new cuisines, as well as to new products. Broccoflower, high quality, nice looking plant crossbred from broccoli and cauliflower, has been making a slow but steady breakthrough to the market. Meanwhile, fast life accompanied by fast food had led to epidemic of nutritional disorders. Lack of iron, zinc and manganese are amongst them. That, alongside other reasons had induced the field experiment with broccoflower, aiming to determine the effect of foliar fertilization on the content of microelements iron, manganese and zinc in the bloom of broccoflower. The experiment was set according to the method of random bloc design with three repetitions and four foliar treatments (control, zinc (0.125 g 0.1 L^{-1}), drin (0.1 mL 0.1 L^{-1}) and boron (0.175 g 0.1 L^{-1})). The highest determined results show 0.87 mg of iron, 0.61 mg of zinc and 0.27 mg of manganese in 100 g of fresh matter broccoflower bloom without statistically significant differences between treatments. Those results show just how well stocked broccoflower is with these minerals, which should be useful in this plant's breakthrough on domestic vegetable market, which is still quite conservative.

Key words*: broccoflower, iron, manganese, micronutrients, zinc.*

INCREASING THE NUTRITIONAL QUALITY OF *PLEUROTUS ERYNGII* BY GAMMA IRRADIATION OF LIVING MYCELIUM

Gabriela POPA[1], Valentin ZĂGREAN[2], Călina Petruța CORNEA[1], Gabriela ȘOVĂREL[2], Bogdan Mihai NICOLCIOIU[2], Ionuț RUSU[2]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Marasti Blvd, District 1, Bucharest, Romania
[2]Research and Development Institute for Vegetable and Floriculture Vidra, 22 Calea Bucureşti, 077185, Vidra, Romania

Corresponding author email: popagabiro@yahoo.com

Abstract

Pleurotus eryngii, known as oyster mushroom, is a commercially cultivated edible mushroom, widely appreciated for its good taste and texture. In this study, we investigated the influence of low doses of gamma irradiation (between 100 and 300 Gy) applied to the living mycelium of two strains of P. eryngii (PeM39 and PeM41), in order to enhance the synthesis of bioactive metabolites with nutritional values. For this purpose, we determined the content of polyphenols, flavonoids, proteins and carbohydrates in ethanol extracts (70%) of P. eryngii fruiting bodies obtained from irradiated mycelium. The results showed that, in the fruiting bodies of both strains, the 300 Gy dose was optimal for stimulating an increase in phenols, flavonoid and carbohydrate content, and the 200 Gy dose was optimal for increasing protein content. Thus, gamma-irradiation treatment of mycelial inoculum may be an effective tool for stimulating the synthesis of secondary metabolites with antioxidant and nutritional properties in P. eryngii.

Key words*: Fruiting bodies; gamma irradiation; mycelium; metabolites synthesis; Pleurotus eryngii.*

MORPHOLOGICAL CHARACTERIZATION AND GENETIC VARIABILITY ASSESSMENT WITH SSR MARKERS IN SEVERAL TOMATO GENOTYPES

Carmen F. POPESCU, Adriana BĂDULESCU, Andreea E. MANOLESCU, Anamaria M. DUMITRU, Dorin I. SUMEDREA

National Research & Development Institute for Biotechnology in Horticulture Ştefăneşti-Argeş, 37 Bucureşti-Piteşti Road, Ştefăneşti, Argeş, Romania

Corresponding author email: carm3n_popescu@yahoo.com

Abstract

A complete morphological description of the tomato genotypes is necessary either for the new cultivars under approval, or for the recommendation of proper tomato cultivars in certain cultural conditions. In this study, the morphological and molecular diversity of 13 tomato genotypes were analyzed to identify distinctness among them. The genetic diversity was evaluated with 8 SSR markers. The efficiency of these markers to reveal the genetic differences with tomato genotypes was proven by: a mean number of scorable bands per marker of 6.62, of which 81.5% were polymorphic bands and the polymorphic information content of 0.764. The cluster analysis grouped the 13 tomato genotypes into two distinct clusters, depending on their type of growth, and inside each group in correlation with parental origin. The evaluation of the relevant characteristics with specific descriptors demonstrated the differences between the genotypes analyzed in terms of their type of growth and the different aspects of the leaves and fruits. Combining the morphological description with molecular methods proved to be efficient for the assessment of distinctiveness among analyzed tomatoes and necessary for documented recommendations for tomato growers.

Key words*: dendrogram, polymorphism,* Solanum lycopersicum, *standard descriptors, variability.*

EXPRESSIVENESS OF THE MAIN QUANTITATIVE CHARACTERS OF *RAPHANUS SATIVUS* VAR. *CAUDATUS* ACHIEVED AT PLANT GENETIC RESOURCES BANK BUZAU

Matilda POPESCU[1], Costel VÎNĂTORU[1], Viorica LUCHIAN-LAGUNOVSCHI[2], Bianca MUȘAT[1], Camelia BRATU[1], Geanina NEGOȘANU[1]

[1]Plant Genetic Resources Bank - for Vegetables, Floricultural, Aromatic and Medicinal Plants Buzău, 56 Nicolae Bălcescu Blvd, Buzău, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Marasti Blvd, District 1, Bucharest, Romania

Corresponding author email: cameliaboteabratu@gmail.com

Abstract

PGRB Buzau has a valuable germplasm collection of Raphanus sativus. The bank's specialists have been involved in the conservation and improvement of this species' resources, obtaining two varieties registered in the Official Catalogue of Romanian Cultivated Plants.
A large number of genotypes of this species was obtained due to the high degree of entomophily. Within the Bank, a considerable number of genotypes have been obtained, among which one valuable genotype has been biologically isolated from the others, showing genetic stability of the main characters, successfully passing the DUS test. The research undertaken in the present study reflects the expressiveness of the main quantitative characters of the newly obtained genotype. The genotype was evaluated in two growing environments, protected and field, and it was found that both quantitative traits in terms of plant height, height, number of shoots, pod production, pod size and yield per plant were clearly superior (1174 g pods/plant) in protected environments. In the field, production was significantly lower (8.7 g pods/plant) but with much lower cost prices.

Key words: *pod, genotype, expressivity, edible, entomophilous.*

BIOLOGY CHARACTERIZATION AND CROP SYSTEMS OF PERENNIAL WALL ROCKET

Cristina PRECUPEANU[1], Gianluca CARUSO[2], Georgiana RĂDEANU[1], Gabriel-Ciprian TELIBAN[1], Lorena-Diana POPA[3], Vasile STOLERU[1]

[1]"Ion Ionescu de la Brad" University of Life Sciences Iași,
3rd Mihail Sadoveanu Alley, Iaşi, Romania
[2]Department of Agricultural Sciences, University of Naples Federico II,
via Università 100, 80055 Portici, Naples, Italy
[3]Agricultural Research and Development Station Secuieni, 377 Principală Str.,
Secuieni, Neamt, Romania

Corresponding author email: vstoleru@uaiasi.ro

Abstract

Diplotaxis tenuifolia (L.) D.C. belongs to the Brassicaceae family, known under the specific common name `perennial wall rocket`, preferred name to distinguish between different species belonging to the Diplotaxis genus. The species is native to the Mediterranean and West Asia, becoming now a cosmopolitan species. Economic interest in cultivation has grown over the last two decades due to a consumer's interest increase in less processed vegetable crops. Traditionally harvested from spontaneous flora, perennial wall rocket is now cultivated for its finer, juicier leaves and more appreciated by consumers than those of Eruca sativa Mill. species. The species can be grown in the system of successive vegetable crops, in the open field and protected spaces. The crop establishment can be done either by direct sowing, in order to obtain `baby leaf` type harvest, or by planting seedlings in the case of crops intended for obtaining fresh mature leaves. This paper provides an overview of the biological and technological features of the Diplotaxis tenuifolia species, in order to promote and introduce it into culture, in the ecopedoclimatic conditions from our country.

Key words*: Diplotaxis tenuifolia (L.) D.C., fresh leaves, farming practices, morphological characters.*

AGROBIOLOGICAL AND TECHNOLOGICAL CHARACTERIZATION OF *PHASEOLUS COCCINEUS* L.

Georgiana RADEANU[1], Neculai MUNTEANU[1], Cristina PRECUPEANU[1], Gabriel-Ciprian TELIBAN[1], Lorena-Diana POPA[2], Vasile STOLERU[1]

[1]"Ion Ionescu de la Brad" University of Life Sciences Iaşi,
3 Mihail Sadoveanu Alley, Iaşi, Romania
[2]Agricultural Research and Development Station Secuieni,
377 Principală Str., Secuieni, Neamt, Romania

Corresponding author email: vstoleru@uaiasi.ro

Abstract

Phaseolus coccineus L. (runner bean) belongs to the Fabaceae family and is the second most important species of the Phaseolus genus, after the common bean (Phaseolus vulgaris L.), which is often confused. The species is cultivated especially for seeds (mature or immature) and some cultivars are growth for pods. The runner bean is grown as annual plant in pure crop or intercropping, being appreciated, to a lesser extent, also for its ornamental value. In Romania it is cultivated on small areas, especially in family gardens, using local populations without using a standard technology, but rather one that is adaptable to environmental conditions. The study focuses on aspects such as morpho-physiological, ecological and phenological features, different cultivation technologies, but also on genetic features and potential breeding methods.

Key words*: runner bean, crop systems, morphological characteristics, Fabaceae.*

BEHAVIOR OF TWO HOT PEPPER HYBRIDS (*CAPSICUM ANNUM* L.) UNDER TRANSYLVANYA GROWING CONDITIONS

Sandor ROZSA, Emese EGYED, Melinda ROZSA, Tincuța-Marta GOCAN, Dănuț-Nicolae MĂNIUȚIU

University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, 3-5 Mănăştur Street, 400372, Cluj-Napoca, Romania

Corresponding author email: rosza.sandor@usamvcluj.ro

Abstract

The hot pepper (Capsicum annum L.) is part of the Solanaceae family, Capsicum genus being an important vegetable crop both fresh and processed. Its production is constrained by a number of problems, among which the decrease in soil fertility is primary. The amount of fertilizer to be applied depends on the fertility of the soil, the rate of fertilizers and organic matter recovery, mineralization and leaching of the soil. Fertilization, management and planting density influence the morphological characteristics of hot peppers. Thus, the parameters of the fruits of chemically fertilized plants, managed and planted at a density of 30,000 plants / ha are superior to the fruits of chemically fertilized plants, managed and planted at a density of 45,000 plants / ha. Lower density and plant management provide better crop aeration and less competition for plant food, and chemical fertilization provides them with faster nutrient absorption.

Key words*: Capsicum, production, variety, fertilizer, fruit length.*

IMPACT OF LOW-INPUT MANAGEMENT AND MICROBIAL BIOSTIMULANTS ON YIELDS OF TRADITIONAL PEPPER VARIETIES

Alicia SÁNCHEZ-SÁNCHEZ[1], Virginia HERNÁNDEZ[1], Pilar HELLÍN[1], Marisa JIMÉNEZ-PÉREZ[2], Adrián RODRÍGUEZ-BURRUEZO[2], José FENOLL[1], Pilar FLORES[1]

[1]Murcian Institute for Agricultural and Environmental Research (IMIDA)
[2]Instituto de Conservación y Mejora de la Agrodiversidad Valenciana (COMAV), Valencia Polytechnic University

Corresponding author email: mpilar.flores@carm.es

Abstract

Traditional varieties are good candidates to be grown under sustainable conditions. In this research we evaluated the effect of reducing fertilization and irrigation dose, and the use of microbial biostimulants (N-fixing + K and P-solubilizing bacteria + mycorrhizal endomycorrhizae fungi) on yield parameters of two traditional pepper varieties (BGV13004, BGV5126) and one commercial variety (Cabañeros). The treatments consisted of two fertilisation levels (100% F and 50% F) combined with two irrigation levels (100% I and 75% I). Furthermore, the effect of microbial biostimulants (B) was studied at the lowest fertilisation rate using the commercial products Bactogreen® and Agromic®. Reduced fertilisation decreased total yield in varieties BGV13004 and Cabañeros, as a consequence of reduced fruit set. On the contrary, in variety BGV5126, the decrease in the concentration of the nutrient solution (100% F vs. 50% F) led to an increase in yield, probably due to a greater sensitivity of this variety to salinity. The effect of B was highly dependent on the variety studied, with both an increase (BGV13004) and a decrease (BGV5126) or no impact (Cabañeros) on total production.

Key words*: PGPB, landrace, local varieties, sustainability, Capsicum.*

BIOCHEMICAL CHANGES DURING THE STORAGE OF SWEET POTATO ROOTS

Rodica SOARE[1], Maria DINU[2], Cristina BABEANU[3], Marin SOARE[1]

[1]University of Craiova, Faculty of Agriculture, 19 Libertăţii Street, Craiova, Romania
[2]University of Craiova**,** Faculty of Horticulture, 13 A.I. Cuza Street, Craiova, Romania
[3]University of Craiova, Faculty of Science, 13 A.I. Cuza Street, Craiova, Romania

Coresponding autor email: dinumariana@hotmail.com

Abstract

The biochemical changes during storage targeted the total dry matter, total soluble solids content, the total and reducing sugar content, the glucose content as well as the starch content, from the roots of six sweet potato genotype (Ipomoea batatas L.*).*
Determinations were performed at harvest and then during storage after 30 days and 90 days. The results showed that the investigated biochemical indices vary during storage depending on genotype and period. Thus, after 30 days of storage, the DM content varied from 21.56% to 29.85% and then increased from 23.75% to 32.42% at 90 days of storage. For the TSS content, values between 9.20% (cultivar 2) and 12.80% (cultivar 3) were initially recorded, so that after 90 days of storage, the values increased from 11.3% (cultivar 6) to 16.26% (cultivar 3). The content of glucose and reducing sugars increased during the storage period of the sweet potato. Storage had little influence on the starch content. There was considerable genotypic variation of this constituent with a reduction of up to 11.30% after 90 days of storage.

Key words*: Ipomoea batatas; genotype, carbohydrate; storage.*

THE INFLUENCE OF THE OXYGENATION OF THE NUTRIENT SOLUTION ON SOME QUALITY PARAMETERS OF THE SPECIES *LACTUCA SATIVA* L CULTIVATED IN THE NFT SYSTEM

Claudia-Maria STOICA[1], Marian VELCEA[1], Lenuța CHIRA[1], Ovidiu Ionuț JERCA[2], Elena Maria DRĂGHICI[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: stoicamariaclaudia@gmail.com

Abstract

Hydroponic crops are an alternative to conventional crops, with a number of advantages such as their adaptability to climatic zones. Obtaining rich harvests is an important aspect in the activity of all large farmers. However, in addition to rich crops, it is also necessary to obtain plants rich in their specific nutrients. It is well known that Lettuce (Lactuca sativa L.) is a globally appreciated plant, for its production there is a high demand, regardless of the season. Lettuce (Lactuca sativa L.) hydroponic crops are an alternative and are used in most climatic zones. Of all the types of hydroponic crops, the cultivation of Lettuce (Lactuca sativa L.) in the NFT system is the most widespread. In these condition, we have performed an experiment at USAMV Bucharest, Faculty of Horticulture, Hortinvest greenhouses, on lettuce cultivated in the NFT system and we have analysed the influence of the oxygen content of the nutrient solution and its flow rate on the quality of lettuce culture in terms of content in macro and microelements as well as in nitrates and nitrites vitamins, enzymes. We also found that there were correlations between the oxygen content of the nutrient solution and the quality parameters of lettuce plants obtained in this system. The aim of the study was to identify the optimum level of oxygen uptake in order to obtain lettuce plants with high quality parameters.

Key words*: Lettuce, flow, oxygenation, quality parameters.*

EFFECTS OF PLANTING TIME ON THE GROWTH AND YIELD OF TOMATO (SOLANUM LYCOPERSICUM L.)

Nikolina SHOPOVA

Agricultural University - Plovdiv, 12 Mendeleev Blvd, Plovdiv, Bulgaria

Corresponding author email: nina_sm@abv.bg

Abstract

The aim of the experiment was to investigate the effect of planting time on the growth and yield of tomato, grown in conditions of late field production. The experiment was carried out during the period 2019 - 2020 on experimental field, Department of Horticulture at Agricultural University - Plovdiv, with cultivar Opal F1. The opportunity of growing and fruiting of plants was evaluated by planting in three periods (through 15 days) - 15-20 June; 1-5 July and 15-20 July. Some biometric and phenological indicator (plant height, leaf area, first flowering cluster, first fruit-set, and other) were reported. The yield (kg/da) was reported by months and total for the period. The results show that the planting time has effects on the growth and yield of tomato. Planting in the period of 15-20 June, the plants fall into conditions near to optimal for the crop, which affects the vegetative and generative growth of plants. The percentage of fruit formation, respectively the yield, increases.

Key words*: tomato, planting time, growth, yield.*

THE EFFECT OF FERTILIZATION ON THE GROWTH PARAMETERS OF SEEDLINGS AND LETTUCE PLANTS GROWN IN THE NFT SYSTEM (NUTRIENT FILM TECHOLOGY)

Chan SOVORN[1], Elena Maria DRĂGHICI[1], Ionuţ Ovidiu JERCA[2]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, Faculty of Horticulture, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: draghiciem@yahoo.com

Abstract

The study was conducted in Hortinvest greenhouses on six varieties of lettuce. I used 3 type of fertilizers, Universol, Organic Grow and Formulex. We followed their effect on growing lettuce seedlings as well as growing plants in the unconventional NFT (Nutrient Film Technology) system. We found differences in the duration of plant emergence, vegetative growth of seedlings as well as plant growth in culture. The aim of the study was to identify the most favorable effect on growth for seedlings and in culture.

Key words*: lettuce, fertilization, Nutrient Film Techology.*

PRELIMINARY RESULTS REGARDING INTEGRATED PEST MANAGEMENT METHODS OF ARTHROPOD SPECIES IN SWEET POTATO CROP - CASE STUDY - WIREWORMS

Tudor STANCIU[1], Ionela DOBRIN[1], Ion TONCEA[2], Gina FÎNTÎNERU[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest,
59 Mărăști Blvd, District 1, Bucharest, Romania
[2]Institute for Research and Development in Agriculture Fundelea,
1 Nicolae Titulescu Street, Fundulea Romania

Corresponding author email: biofriendsfarm@gmail.com

Abstract

Wireworms, larvae of click beetles, Agriotes spp, are important pests of sweet potato. There is currently no curative treatment available to control wireworms and preventive treatments are mainly chemical. Therefore, is a need for a better understanding of the damaging factors to develop effective integrated control strategies and methods (IPM). This study aims to present the preliminary results on bait and pheromone traps used in a sweet potato crop to evaluate the densities of three major wireworm species in south-eastern Europe (Agriotes lineatus, A. obscurus, and A. ustulatus). Biological control with Metharizium anisopliae and Beauveria bassiana was applied. Agriotes ustulatus was the main species caught with pheromone traps, over 2400 specimens, while A. lineatus were 270 specimens, and A. obscurus 280. Statistical analysis was performed for evaluating the effectiveness of biological control with Metharizium anisopliae and Beauveria bassiana, the result demonstrating the viability of the method, the number and size of commercial sweet potatoes being significantly higher in the treated plot. The study offers perspectives to develop preventive and curative solutions for the sustainable control of wireworms.

Key words: *wireworms, integrated control strategies and methods (IPM), A. lineatus, A. obscurus, A. ustulatus.*

EFFECTS OF SEVERAL ORGANIC FERTILIZERS ON GROWTH, DEVELOPMENT AND QUALITY PROPERTIES OF TOMATOES OBTAINED IN ORGANIC SYSTEM: A REVIEW

Andreea ANTAL-TREMURICI, Alexandru BUTE, Daniela BOURUC, Creola BREZEANU, Petre Marian BREZEANU

Vegetable Research and Development Station Bacău,
Calea Bârladului, no. 220, Bacău, Romania

Corresponding author email: antal_andreea97@yahoo.com

Abstract

One of the main goals of today's agriculture is to produce healthy food and to increase the efficiency of plant production by protecting and conserving the environment. Organic tomatoes (Lycopersicon esculentum Mill.) represent one of the most valuable crops consumed widely either fresh or processed because for its sensory qualities, nutritional value and for its benefits on human health (reduce the risk of cardiovascular disease and certain types of cancer). Organic fertilizers are originated from plant and animal wastes and contain N, P, K and microelements. They are used to obtain the nutritional demands of plants for their growth and development, as well as improve the physical, biological and chemical properties in the soil. The objective of this study was to evaluate the effectiveness of organic fertilizers on quality characteristics (soluble solids contents, lycopene and carotenoids, titratable acidity, minerals and vitamins), on the growth and development of organically cultivated tomatoes based on the lasted valuable information.

Key words: *Physico-chemical characteristics, vegetable growth, biofertilizers, sustainable agriculture.*

THE ORGANOLEPTIC QUALITIES OF SOME VARIETIES OF FRENCH BEANS

Bianca-Elena TĂNASE[1], Adrian ASĂNICĂ[3], Costel VÎNĂTORU[1], Elena BARCANU[2], Ovidia AGAPIE[2], Ion GHERASE[2]

[1]Plant Genetic Resources Bank - for Vegetables, Floricultural, Aromatic and Medicinal Plants Buzău, 56 Nicolae Bălcescu Blvd, Buzău, Romania
[2]Vegetable Research Development Station Buzau, 23 Mesteacanului Street, Romania
[3]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Marasti Blvd, District 1, Bucharest, Romania

Corresponding author email: biancae.tanase@yahoo.com

Abstract

French beans are one of the most consumed vegetables in Romania, especially during fasting periods, but also worldwide, knowing that it has an important nutritional value. Due to its high protein content, many people who want to adopt an animal protein-free diet resort to eating bean-based foods. In the present study, four french bean genotypes were analyzed that showed differences in color, seed size and weight, but most importantly in taste.
From these, a control variety was chosen that presented white seeds, more precisely the 'Doina' variety, a variety approved by VRDS Buzau in 2020. Tastings were carried out followed by the completion of opinion polls, which found that the genotype preferred by consumers was the L3 genotype, a genotype that presents seed of red color. The purpose of this article was to find out if consumers are open to eating beans of a different color than the classic white.

Key words*: beans, genotype, 'Doina', VRDS Buzau.*

PERENNIAL WALL ROCKET CROP AS AFFECTED BY CROP CYCLE AND FERTILIZATION TYPE

Gabriel Ciprian TELIBAN[1], Cristina PRECUPEANU[1], Gianluca CARUSO[2], Neculai MUNTEANU[2], Lorena-Diana POPA[3], Vasile STOLERU[1]

[1]"Ion Ionescu de la Brad" University of Life Sciences Iași,
3rd Mihail Sadoveanu Alley, Iaşi, Romania
[2]Department of Agricultural Sciences, University of Naples Federico II,
via Università 100, 80055 Portici, Naples, Italy
[3]Agricultural Research and Development Station Secuieni,
377 Principală Str., Secuieni, Neamt, Romania

Corresponding author email: dy.hemp420@gmail.com; vstoleru@uaiasi.ro

Abstract

Diplotaxis tenuifolia (L.) D.C. - the perennial wall rocket is a species native to Mediterranean and West Asia, belonging to the Brassicaceae family. Currently, it is recognized as a cosmopolitan species, being cultivated for its fine and juicy leaves, highly appreciated by consumers. In our country, however, it is less known in specialized literature. Considering these aspects, the aim of this paper is to evaluate the combined effect of the crop cycle (autumn and spring) with different types of fertilization: non-fertilization, chemical fertilization and application of microorganisms on a perennial wall rocket culture, established in polytunnel. The research was carried out in North-Eastern part of Romania, during two experimental years (2019 - 2020 and 2020 - 2021), in the vegetable growing field of USV Iasi. Experiments have shown that both harvesting cycles determined good physiological and production results, with or without applied fertilization, while by using chemical fertilization, the highest values of production ensured at statistical level were obtained, for both crop cycles. Thus, we can deduce that there are real premises in order to promote and introduce this species in culture, in the eco-pedo-climatic conditions from North-Eastern part of Romania and even in our country.

Key words*: Diplotaxis tenuifolia (L.) D.C., Leaf Area Index, physiological and biometrical analysis, production results.*

PHENOTYPICAL RESEARCH CONCERNING CLIMBING BEAN SEEDS

Eliza TEODORESCU, Valentina STOIAN, Valerica CAZAN

Vegetable Research Development Station Buzau, 23 Mesteacanului Street, Romania

Corresponding author emails: teodorescu.eliza@gmail.com, neicu_eliza@yahoo.com

Abstract

Bean germplasm collection of Vegetable Research and Development Station Buzău, Romania, contain over 450 accessions. The maintenance of this collection must accomplish the following requirements: maintaining the variability of this species (Phaseolus vulgaris L.), creating new varieties and adaptability to the climate changes in what it concerns these accessions. In 2020, this collection was cultivated in green – house covered with polyethylene. This paper presents the comparative study of 10 climbing bean seeds accessions. The seeds of each accession were evaluated in what it concerns quantitative (100 seed weight, length, thickness and width) and qualitative characteristics (seed colour, brilliance, veining and shape). The seeds weight varied between 57.57 g (V_5) and 28.88 g (V_3). More than half of the seeds variants taken into study, presented white colour, except: V_1 and V_3 - different beige and V_5 presents 2 colours (half white, half dark red). The highest values regarding seeds length and width were registered at V_{10} (17.03 and 9.11 mm). All accessions presented are stabile and it presented stability during the last growing seasons.

Key words*: Phaseolus vulgaris L. var. communis, germplasm colection, accessions.*

EXPERIMENTAL RESEARCH ON BIOINSECTICIDE ACTIVITY OBTAINED BY USING AN OLEIC EXTRACT FROM DWARF SILVER FIR ON SOME VEGETABLE CROPS

Iulian VOICEA[1], Viorel FATU[2], Florin NENCIU[1], Catalin PERSU[1], Remus OPRESCU[1]

[1]National Institute of Research-Development for Machines and Intallations Designed for Agriculture and Food Industry, 6 Ion Ionescu de la Brad Blvd, District 1, Bucharest, Romania
[2]Fruit Research and Development Station Bănеasa, 4 Ion Ionescu de la Brad Blvd, District 1, Bucharest, Romania

Corresponding author email: voicea_iulian@yahoo.com

Abstract

The article presents a series of experimental studies on the use of an oleic extract, produced by steam separation utilizing a prototype distillation equipment. The separation process is performed with the use of wet saturated steam under pressure, using as raw material twigs and buds of dwarf silver fir. Since the volatile extracts of aromatic plants do not bring a direct nutritional contribution to the seeds subjected to germination, the germination increase and the root growth of the plants can be obtained only from the exercise of the anti-microbial, anti-oxidant and insect-repellent effect. The use of essential oils in the protection of seeds and rhizosphere is an ecological method because it does not negatively affect the number and frequency of species of useful microorganisms. The nutritional relationship that is established between the seeds treated with volatile oils and the germination bed can be influenced by the changing proportions of microbial populations with beneficial effects on productivity.

Key words*: bioinsecticide activity, oleic extract, dwarf silver fir, vegetable crops.*

STUDY REGARDING THE STRUCTURE OF A RANCH ACCORDING TO THE CIRCULAR ECONOMY

Elena BRÎNZEA VIŞINESCU, Elena CONSTANTIN, Razvan Ionuţ TEODORESCU

University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Marasti Blvd, District 1, Bucharest, Romania

Corresponding author email: elenavisinescu@yahoo.com

Abstract

The circular economy is the sole viable alternative of the linear economy, namely the classic model of output and input, where the raw materials are taken from nature, being used to manufacture the products, which afterwards are used and possibly eliminated as wastes – manufacture – use – throw pattern.
On the basis of this concept has been projected a logical scheme of the circular economy for the output activity developed at the farm made with European funds, fields crops farm and manufacturing industries of zootechnical by-products.
The impacts on the economic circularity are highlighted through specific indicators. For the present study it has been identified the possibility to evaluate the circular utilization rate and the material indent, considering the value of the primary materials used to get the final product.

Key words: *circular economy, logic scheme of the circular economy, circular utilization rate, material indent.*

ENVIRONMENTAL BENEFITS OF BIOFERTILIZERS APPLICATION IN THE AGROECOSYSTEM. A REVIEW

Veselka VLAHOVA

Agricultural University - Plovdiv, 12 Mendeleev Blvd, Plovdiv, Bulgaria

Corresponding author email: vvlahova179@abv.bg

Abstract

Organic farming is a form of sustainable agriculture, where the care works towards environmental protection interweaves in a broad sense with crop production. In the organic system, farmers limit their actions to one unit in order not to damage another unit in the agroecosystem. In this farming system, permitted fertilizers and biopesticides are applied to spare the species of geobionts and insects that play a biological role in the agroecosystem. Nitrogen biota fix nitrogen in symbiosis. Cultivated crops require the application of a particular type of nitrogen biofertilizer, with Rhizobium used in legumes, Azotobacter or Azospirillum in non-legumes, Acetobacter in sugarcane, and blue-green algae and Azolla in lowland rice paddies. Phosphate biofertilisers help the soil to reach an optimum phosphorus content and level, and their use is not dependent on the type of crop grown. Biofertilizers are products containing live cells of various types of microorganisms, which have the capacity to turn important nutrition elements into accessible forms through biological processes. Vermicompost improves soil structure, increases soil fertility, as it contains nutrition substances in a form that is absorbable by plants (phosphates, exchangeable calcium and soluble potassium). Biofertiizers are a source of nutritions for the cultivated crops, as they improve the physical properties of the soil (moisture absorption capacity, aeration) and its structure. Biofertilizers improves the absorption of nutrients by plants, stimulates the microbiological activity, increases the soil humus levels, and improves the long-term soil fertility. The application of biofertilizers has an impact on the formation of a larger plant biomass, as it increases the mass and improves the number of fruits per plant, increases the standard yield and improves the quality of the produce.

Key words*: Agroecosystem, biofertilizers, organic farming, sustainable agriculture.*

VARIATION OF AUXINS AND CYTOKININES IN MICROPROPAGATION PROTOCOLS OF TWO WORLWIDE IMPORTANT SPECIES: *SOLANUM TUBEROSUM* AND *IPOMOEA BATATAS*

Oana VENAT[1], Adrian PETICILA[2], Cătălina-Ioana NICOLAE[1], Cristian-Mihai POMOHACI[3], Dorel HOZA[2]

[1]Research Centre for Studies of Food and Agricultural Products Quality, 59 Mărăşti Blvd, District 1, Bucharest, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania
[3]Faculty of Land Reclamation and Environmental Engineering, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: catalinaioana.nicolae@gmail.com

Abstract

Solanum tuberosum and Ipomoea batatas are the third and the seventh world ranking species in terms of yield and consumption and they are relatively cultivated based on micropropagation techniques for limiting viruses spreading and other diseases. In this work we analyzed varieties of Ipomoea batatas, 'Ro-Ch-M', 'KSH' and 'KSP1', two varieties of Solanum tuberosum L. with purple flesh, 'Violet Queen' and 'Purple Majesty' and their response to variation of auxins and cytokinins on in vitro cultivation. The study compared the effects of basal MS medium containing various concentrations of α-naphthaleneacetic acid (NAA) and 6-benzylaminopurine (BAP) in combination with gibberellic acid (GA3) in micropropagation of those species, using material from a starter culture in vitro induced as well. For Solanum tuberosum, the shoot induction ranged between 4–5 days with variation among NAA concentrations, the longest shoots (9,8 cm), maximum number of nodes (4-5), and maximum number of leaves (10.00) were recorded on 'Purple Majesty' on variant containing 0,25 mg/L BAP + 0.03 mg/L NAA+0,05 mg/L GA3. For Ipomoea batatas, the shoot induction ranged between 5-6 days with with variation among NAA concentrations, the longest shoots (7,8 cm), maximum number of nodes (3.8 cm), and maximum number of leaves (12.00) were recorded on 'KSP-1' on variant containing 0,25 mg/L BAP + 0.05 mg/L NAA+0,05 mg/L GA3. The results showed that the combined effect of various concentrations of NAA between 0.01 mg/l and 0,05 mg/L, BAP between 0,25 mg/L and 1.00 mg/L and GA3 could provide solution for extend in vitro production of Solanum tuberosum tubers and potatos for Ipomoea batatas as base materials for industrial cultivation.

Key words*: auxins, cytokinins, Ipomoea batatas, micropropagation, Solanum tuberosum.*

A COMPREHENSIVE STUDY REGARDING MULTIPLICATION OF TWO WORLDWIDE ECONOMICALY IMPORTANT SPECIES: *SOLANUM TUBEROSUM* AND *IPOMOEA BATATAS* - *IN VITRO* APPROACH

Oana VENAT[1], Adrian PETICILĂ[2], Ioana-Cătălina NICOLAE[1], Dorel HOZA[2]

[1]Research Centre for Studies of Food and Agricultural Products Quality, 59 Mărăşti Blvd, District 1, Bucharest, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: catalinaioana.nicolae@gmail.com

Abstract

Solanum tuberosum is the third world ranking species in terms of yeld and consumption, after rice and wheat. Ipomoea batatas is the seventh world ranking production vegetable and provides food for over 68% of population. They are growing and fructification in hard climate conditions with arid soils or desert (sweet potato), and have important role in biodiversity through culture conditions adaptability, plant diseases and pathogens resistance (potato). Despite all these advantages, infections that are combined on those species reduce production capacity up to 90% in both species and this factor can be controlled to some extent by using micropropagation techniques and thermotherapy. Scientific papers, treaties and communications were studied in order to gather the most relevant dates regarding micropropagation of those two species.The high genetic variability this two species have makes it difficult to standardize micropropagation protocols, such as disinfection, phytohormones combinations and other techniques used in micropropagation regarding the devirosation of the plant material and the production of virus free material. Solanum tuberosum and Ipomoea batatas are two species that are two of the most cultivated worldwide, in poor or in development countries based on their nutritional values and their economic importance, scientists and breeders are focusing on biotechnologies to produce new varieties with high production capacity and promising resistance to pest, diseases and viruses.

Key words*: Ipomoea batatas, micropropagation, Solanum tuberosum, virus free.*

BEHAVIOR IN DIFFERENT CULTURAL SYSTEMS OF A GENETICALLY STABILIZED *CYMBOPOGON CITRATUS* (LEMONGRASS) GENOTY AT PGRB BUZAU

Costel VÎNĂTORU[1], Adrian PETICILĂ[2], Matilda POPESCU[1], Bianca MUȘAT[1], Camelia BRATU[1], Cristian ȘOMOIAG[1]

[1]Plant Genetic Resources Bank - for Vegetables, Floricultural, Aromatic and Medicinal Plants Buzău, 56 Nicolae Bălcescu Blvd, Buzău, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: zamfir_b@yahoo.com

Abstract

PGRB Buzau focused on acclimatization and breeding of new species that can be grown as vegetable crops in Romania. Since 2010, the Bank's specialists have been studying the species Cymbopogon citratus, accumulating a valuable genetic resource. Two genotypes with distinct phenotypic expressiveness have been genetically stabilized, G1 with strong anthocyanin coloration at leaves base and G2, the subject of this study has the entire plant with light green leaves. It was found that in greenhouse the species can be grown as a perennial and in the field, due to negative temperatures over winter, it requires protection or annual establishment of the crop. In terms of quantitative characters expressiveness, significantly higher values were recorded in the greenhouse, the maximum green mass yield obtained being 4182 g/plant of which 45% represents the production of edible stems. The species can be successfully cultivated both in greenhouse and in the field in Romania. No diseases or pests have been found to affect the crop and the species is appreciated for its strong lemon aroma and multiple uses as ornamental, medicinal, aromatic.

Key words*: aromatic, acclimatization, breeding, germplasm, lemon grass.*

COMPARATIVE STUDY OF DIFFERENT CULTIVARS OF LETTUCES IN UNHEATED POLYETHYLENE GREENHOUSE DURING WINTER-SPRING PERIOD

Milena YORDANOVA, Zhelyu AVRAMOV, Nidal SHABAN

University of Forestry, Faculty of Agronomy, 10 Kliment Ohridski Blvd, 1797, Sofia, Bulgaria

Corresponding author email: yordanova_m@yahoo.com

Abstract

The aim of our study was to test some varieties of lettuce in unheated greenhouse (high tunnel) for the winter growing with November transplanting. The experiment was carried out in the period 2015-2016 in the experimental field on University of Forestry - Sofia (42° 7' N, 23° 43' E). Were selected 19 cultivars (16 Batavia and 3 Lollo types) with different requirements for the terms and conditions of cultivation. The seedlings were planted on the block method with four replications in the second ten days of November in polyethylene greenhouse. Until the time of harvesting, four surveys have been made on the percentage of rooted and dead plants. During the harvesting of production (second ten days of March - early April) were made biometric measurements (diameter and average weight per plant). Several cultivars for winter indoor cultivation were highlighted: 6 from Batavia, all of Lollo, and two from Batavia for outdoor. Regardless of recommendations given for each cultivar it needs they to be screened for each region, microclimate and growing period.

Key words*: Batavia type, Lactuca sativa, Lollo type, High tunnel, November transplanting.*

FERTILIZATION SYSTEMS EFFECT ON THE GROWTH AND PRODUCTIVE MANIFESTATIONS OF GREENHOUSE TOMATOES, CULTIVATED AS A SOIL CROP

Plamena YANKOVA[1], Hriska BOTEVA[2]

[1]Technical University of Varna, Department of Plant Production, 1 Studentska Str., Varna, Bulgaria
[2]Maritsa Vegetable Crops Research Institute - Plovdiv, 32 Brezovsko shosse Str., Plovdiv, Bulgaria

Abstract

The purpose of the study is optimization of fertilization with the greenhouse tomatoes. The experimental work has been brought out during the period 2018-2019, in the test field of department "Plant Production" in a polyethylene greenhouse, without heating, with two varieties tomatoes - Grando F_1 and Pink Rok F_1, grown as a soil crop. Three schemes of fertilization have been tested with five formulations fertilizers for fertigation: brought in as main fertilization /control/ and a combined scheme: fertilization in seven and three days during the vegetation on the increase rate of the vegetative mass and productivity of the plants.
The results from the tested fertilization schemes show a positive effect on the growth and productive manifestations with both tomato varieties in comparison with the control. It is statistically proven that the impact is bigger with the combined fertilization by YaraTera Kristalon Special (18-18-18); YaraTera Kristalon Lazur (20-05-10); YaraTera Kristalon Orange (6-12-36); YaraTera Kristaflex Yellow 12-32-11 and YaraLiva Calcinit, brought in in 3 days, in comparison with the fertilization in 7 days, which is expressed stronger for variety Grando F_1. The results about the number and mass of the fruit per plant are analogous. By the analysis carried out on the averaged data is established that variety Grando F_1 exceeds as per productivity variety Pink rok F1 by 11.1% (fertilization in 3 days) and 4.8% (fertilization in 7 days), as the differences are mathematically proven.

Key words*: Solanum lycopersicum L, polyethylene greenhouse, fertilization, growth manifestations, productivity.*

INFLUENCE OF MICRONUTRIENT CONTENT OPTIMIZATION ON THE VEGETABLES QUALITY AND YIELD

Maryna ZAKHAROVA, Sviatoslav BALIUK, Ludmila VOROTYNTSEVA

National Scientific Center Institute for Soil Science and Agrochemistry Research, 4, Chaikovska Str., Kharkiv, Ukraine

Corresponding author email: zakharova_maryna@ukr.net

Abstract

Nutritional quality is critical role to improving human health. Even mild micronutrient deficiencies in foods have negative health consequences. Finding ways to address micronutrient deficiencies is central to meeting the UN Sustainable Development Goals. The micronutrient content in plant foods depends on their content in the soil. One of the ways to increase the supply of these nutrients (when the content in the soil is low) is to add them when growing the plants. The experiment was carried out in order to investigate the effect of the introduction of trace elements Zn, Cu and Co in various ways in the cultivation of carrots, beets and cabbage. It was carried out under irrigated conditions. The use of microfertilizers has an ambiguous effect on micronutrient content in vegetables. Zn content slightly increased in cabbage, but did not increase in carrots and beets. Cu content increased in cabbage and beets, but remained unchanged in carrots. Co content increased in carrots, beets and cabbage. The use of microfertilizers has increased the yield of vegetables.

Key words*: irrigation, micronutrient, soils, vegetables.*

FLORICULTURE, ORNAMENTAL PLANTS, DESIGN AND LANDSCAPE ARCHITECTURE

THE EFFECT OF TEMPERATURE AND STRATIFICATION TIMES ON SEEDS GERMINATION OF SOME *GLADIOLUS* SPECIES

Petronica AMIŞCULESEI, Maria APOSTOL, Neculai MUNTEANU, Lucia DRAGHIA

"Ion Ionescu de la Brad" University of Life Sciences Iasi,
3rd Mihail Sadoveanu Alley, Iasi, Romania

Corresponding author emails: amisculesei_petronica@yahoo.com, lucia@uaiasi.ro

Abstract

In this paper, the germination of seeds from three species of the genus Gladiolus was studied: G. imbricatus, G. byzantinus and G. tristis. The seeds used had different origins: the seeds of G. imbricatus and G. byzantinus come from the plants from the Floriculture collection of at the Faculty of Horticulture ("Ion Ionescu de la Brad" Iasi University of Life Sciences), and the seeds of G. tristis come from specialized companies. The seeds were stratified at 4°C for 44, 58, 74, 86 and 98 days. The seeds were germinated in Petri dishes in the germination chamber at different temperatures to trigger the germination (13-14°C, 17-19°C and 20-22°C). Data obtained showed that the germination percentage depend of Gladiolus specie, temperature and number of days of stratification. Thus, at G. byzantinus, the best germination rate was obtained at the temperature of 13-14°C, after 58 days of stratification; in the case of 74 days stratified seeds, the germination temperature did not affect the percentage of germinated seeds. In G. tristis, germination was favored by temperatures between 17-19°C. The seeds of G. imbricatus germinatedin a reduced percentageonly after 98 days of stratification, but regardless of the temperature.

Key words: *germination, gladiolus, seed, stratification, temperature.*

INFLUENCE OF THE PLANTING SEASON AND CORMS SIZE ON THE CROCOSMIA, IN AGROCLIMATIC CONDITIONS OF IASI (NORTHEASTERN ROMANIA)

Petronica AMIŞCULESEI, Maria APOSTOL, Roberto Renato BERNARDIS, Lucia DRAGHIA

"Ion Ionescu de la Brad" University of Life Sciences Iași,
3rd Mihail Sadoveanu Alley, Iaşi, Romania

Corresponding author emails: amisculesei_petronica@yahoo.com; lucia@uaiasi.ro

Abstract

The genus Crocosmia, from the Iridaceae family, includes the plants with obvious potential both for garden decoration and as a cut flowers. This paper evaluated the influence of the planting times and the size of the corms on the some characters of ornamental interest of Crocosmia plants, in the agroecological conditions from northeastern Romania (Iași). The corms of Crocosmia 'Lucifer' from two size categories (3-5.9 g and 6-9 g) were used, which were planted in the experimental field in November and April.The observations and determinations made during 2018-2021 highlighted the fact that from the corms with a mass between 6-8 g, planted in autumn, they ensured the obtaining of plants with the highest number of flower stems and the most flowers on the stem. Regarding the height of the flower stems, the best results were recorded in corms with a mass between 3-5.9 g, planted in autumn. In the case of corms planted in the spring, the results were less significant, except for the number of shoots in plants resulting from large corms (6-8 g). The flowering period was longer to the plants obtained from corms of 3-5.9 g, planted in autumn.

Key words*: corm size, crocosmia, planting time, morphological characters.*

EFFECT OF LEAD ON SEEDS GERMINATION OF *COLEUS BLUMEI* SPECIES

Maria APOSTOL, Elena Liliana CHELARIU, Lucia DRAGHIA, Raluca Maria HLIHOR, Laura ZALESCHI, Laura ZALESCHI

"Ion Ionescu de la Brad" University of Life Sciences Iaşi,
3rd Mihail Sadoveanu Alley, Iaşi, Romania

Corresponding author email: mariabrinza2007@yahoo.com

Abstract

The research aimed at establishing the level of lead concentration in the soil, which `Jade`, `Rose` and `Velvet red` Coleus varieties, can tolerate without significantly affecting the percentage of germination and plant sprouting. The experience was conducted in 5 variants with 4 replicates, each replicate having 50 seeds. The humidity of the substrate was performed with water for the control sample (C) and with PbCl2 solutions for the other variants (it was calculated the required amount of PbCl2 to obtain a contamination with Pb of 50 ppm, 100 ppm, 200 ppm, 400 and, respectively, 500 ppm). The effect of lead on seed germination was assessed by the percentage of plant sprouting, germination rate, seedling rate and velocity. The significant decrease in the percentage of normal sprouts and the increase of percentage of dead seeds in variants V5 and V6 suggest the level of supportability of these varieties. The increase of lead concentration in the germination substrate caused the decrease of the seedling rate and of the velocity of seedling for all varieties under study.

Key words*: Coleus blumei, germination, heavy metals, normal sprouts, velocity.*

THE INFLUENCE OF THERAPEUTIC HORTICULTURE ACTIVITIES ON QUALITY OF LIFE (QOL) ISSUES

Timea BURU, Erzsebet BUTA, Maria CANTOR

University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca,
Faculty of Horticulture, Department of Horticulture and Landscaping,
3-5 Mănăștur Street, 400372, Cluj-Napoca, Romania

Corresponding author email: maria.cantor@usamvcluj.ro

Abstract

It can be stated that during the last two years, the access and activities involvement in nature, public green areas or gardens were reduced or even suppressed by the crisis caused by the COVID 19 pandemic. However, in many countries' gardens were used in global public health crisis as a refuge to find peace of mind, pleasure, respite or relief. Therapeutic horticulture activities as gardening and people-plant interaction can offer them a meaningful time-spending outside. Several research studies indicates that this type of activities can increase people well-being and can reduce fatigue, attention disorder, anxiety, chronic stress or depression, and these long-term effects are frequently identified after an infection with coronavirus. The aim of present research was to analyse the influence of gardening activities in Quality-of-Life Issues like physiological, safety, social, esteem and self-actualization statements. In this regard, a questionnaire has been adapted including 15 statements to which respondents had to choose an answer from two possible options (affirmative or negative answer). The experimental study was conducted based on 27 people, who were involved in gardening activities for 3 days, 10 days or 6 weeks, depending on the group to which they belonged. The results indicated that all participants `enjoyed working outside`, most of them (96.3%) identified that `gardening is working with nature`. Even if 25 people stated that `the green area is a good place to meet people`, not everyone enjoyed working in group, because 63.0% of the said that they `enjoyed working alone`. Regarding the conducted gardening activities during the three study trials, most of them (96.3%) `wish to have the opportunity to attend regularly public horticultural therapy activities (gardening)`.

Key words*: gardening; questionnaire; therapeutic horticulture; well-being.*

THE ANALYSIS OF SOME ORNAMENTAL ROSE VARIETIES GROW IN THE GREEN SPACES FROM IAȘI

Roberto BERNARDIS[1], Marius DASCĂLU[1], Liliana CHELARIU[1], Cristina ZLATI[1], Roxana PAȘCU[1], Daniela POȘTA[2]

[1]"Ion Ionescu de la Brad" University of Life Sciences Iași,
3rd Mihail Sadoveanu Alley, Iaşi, Romania
[2] Banat University of Agricultural Sciences and Veterinary Medicine
"King Mihai I of România" from Timisoara, 119 Aradului Street,
Timișoara, Romania

Corresponding author email: mdascalu2000@yahoo.com

Abstract

Species of the genus Rosa L. have importance for: creating green spaces, getting roses and their use as rootstock for cultivated varieties. The purpose of this paper is to highlight the possibilities of identifying potential ornamental species in the genus Rosa sp. The observations regarded six rose varieties: 'Queen Elizabeth', 'Golden Monica', 'Kardinal', 'Ingrid Bergman', 'Montana' and 'Diamond Jubilee'. There were studied six features defining the decorative value of these varieties, respectively: the foliage, the diseases resistance, the flowering intensity, the form of the flower, the colour of the petals and the odor.

Key words: *roses, leafage, flower, blossoming, perfume.*

PASSIFLORA QUADRANGULARIS GROWTH RESPONSE TO FERTILIZATION REGIMES IN CONTROLLED CLIMATE

Paula BOBOC (OROS), Erzsebet BUTA, Corina CĂTANĂ, Maria CANTOR

University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Faculty of Horticulture, 3-5 Manastur Street, 400372, Cluj-Napoca, Romania

Corresponding author: maria.cantor@usamvcluj.ro

Abstract

Enriching the assortment of flowering plants in Romania by introducing exotic species in the context of contemporary climate changes is of real interest. Passiflora quadrangularis is a climbing plant cultivated for its fruits, nutraceutical properties, secondary metabolite content and ornamental value. This research was developed in order to validate the influence of foliar fertilizers on morpho-biometric traits. A bifactorial experiment was performed using the method of randomized blocks with three replicates. In this regard, the organic biostimulator Cropmax and the mineral fertilizer Nutricomplex 20-20-20 + M.E. were tested. Fertilization was carried out periodically during the vegetation period, in three doses: 0.05%, 0.1% and 0.2%. Determinations were made regarding the main morpho-biometric traits, the results being statistically interpreted. All treatments recorded higher values than the control variant (untreated), and the Cropmax biostimulator has a significantly positive effect on plants development.

Key words*: foliar fertilizers, morpho-biometric traits, Passiflora.*

RESEARCH ON THE INFLUENCE OF DIFFERENTIATED HYDRATION ON PHYSIOLOGICAL PROCESSES ON TWO LAWN MIXTURES

Laurențiu CAIMAC, Carmen BEINȘAN, Mihaela MOATĂR, Olimpia IORDĂNESCU, Tiberiu IANCU, Cosmin Alin POPESCU, Adina HORABLAGA, Dorin CAMEN

Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania", 119 Calea Aradului, Timișoara, Romania

Corresponding author email: ahorablaga@yahoo.com

Abstract

Today, in most countries, which have reached a very high level of industrialization, technicalization and urbanization, the conservation and creation of green areas is an important means of protecting man and his living environment. Green spaces are good for human health, not only by creating a favorable microclimate and a calmer environment, with cleaner and better oxygenated air, but also by influencing the neuropsychic state.

Lawn is an essential and irreplaceable element for leisure and sports and is more than just grass. It is an indispensable landscape element with multiple values, through its silky texture, attractive appearance, green color, color that represents nature and life, freshness, rebirth, hope and vigor.

The aim of the research was to study the influence of differentiated hydration on physiological processes in two lawn mixtures. For this purpose we used two types of lawn, the first, Turfline, composed of a mixture of 3 types of lawn seeds (65% Festuca arundinacea Starlett; 15% Lolium perenne Double; 20% Poa pratensis Geisha) and the second RPR Regenerating, namely Lolium perenne with regeneration by stolons, both irrigated daily and every three days. For the study of differentiated hydration on the two lawn mixtures, we determined the content of chlorophyll pigments in the leaves (SPAD units) and the rate of photosynthesis (%).

The results of the research show that irrigation did not significantly influence the chlorophyll content of the two types of lawn. Regarding the photosynthetic capacity of the turf mixtures under study, it is observed that this has higher values in the case of RPR Regenerating, irrigated every 3 days, which indicates that this type of lawn is more resistant to drought than Turfline.

Key words: *lawn, chlorophyll, photosynthesis, irrigation, Festuca arundinacea, Lolium perenne, Poa pratensis.*

COMPARATIVE STUDY ON THE BEHAVIOUR OF *PLECTRANTHUS FORSTERI* AND *COLEUS BLUMEI* SPECIES GROWING ON THE GROUND AND IN VERTICAL SYSTEMS FOR GREEN FAÇADES IN THE CLIMATE OF NORTH EAST ROMANIA

Mirela COJOCARIU, Elena-Liliana CHELARIU, Ciprian CHIRUȚĂ, Roxana PAȘCU, Bogdan-Vlad AVARVAREI

"Ion Ionescu de la Brad" University of Life Sciences Iaşi,
Faculty of Horticulture, 3 Mihail Sadoveanu Alley, Iaşi, Romania

Corresponding author email: julia@uaiasi.ro

Abstract

The flowering species Plectranthus forsteri and Coleus blumei, stand out with their compact foliage, particularly decorative and a high degree of coverage in a short time. This paper aims to study the behaviour of these species in vertical systems for green façades, in the climatic conditions of North East part of Romania. The vertical experiment was set up on the façades of an experimental module built specifically to test the strength and adaptability of several ornamental species in this system. The experimental structure was made of height levels that were applied on the four facades of the module oriented towards the four cardinal points. A ground control variant has also been set up. The study found that Plectranthus forsteri and Coleus blumei grown in vertical systems for green façades show high adaptability regardless of the cardinal orientation. On the ground, Plectranthus forsteri behaved well, creating a compact and uniform layer unlike Coleus blumei which had a more modest behaviour in the experience.

Key words*: Plectranthus, Coleus, green façades.*

YIELD PERFORMANCES OF QUINOA FOR LEAVES UNDER IRRIGATION AND FERTILISATION REGIME

Raluca CHIRIȚĂ, Gabriel Ciprian TELIBAN, Neculai MUNTEANU, Teodor STAN, Ștefan VIZITEU, Vasile STOLERU

"Ion Ionescu de la Brad" University of Life Sciences Iaşi,
Faculty of Horticulture, 3 Mihail Sadoveanu Alley, Iaşi, Romania

Corresponding author email: vstoleru@uaiasi.ro

Abstract

Quinoa is a pseudo-cereal native to South America, known mainly for seeds. In recent years, studies and research have begun to be done on leaves, as it is known that in the area of origin, some local populations used as vegetables. The aim of the research is to evaluate the effect of fertilisation and irrigation on the growth and production of two quinoa varieties (Vikinga and Puno), in order to introduce them on the Romanian economic market. The experience was organised in vegetation pots, in 42 variants, in the greenhouse. The obtained results show that the species is suitable for cultivation in protected areas, under the influence of factors: cultivar, fertilisation and irrigation. The highest amount of leafy mass was obtained by Vikinga variety under biological fertilisation irrigated with 75% of water from substrate capacity (SC) positively correlated with the leaf area and the number of leaves. The irrigation with a rate of 75 % of the substrat capacity obtained the best results, compared to the regimes of 50 % and 100 % of the substrate capacity.

Key words*: quinoa, cultivar, fertilisation, irrigation.*

ROOT SYSTEM ARCHITECTURE RESPONSES TO HEAT STRESS IN SEVERAL *CYCLAMEN PERSICUM* ACCESSIONS AND SPECIES CORRELATED WITH PLANT BIOMASS

Mihaiela CORNEA-CIPCIGAN[1], Doru PAMFIL[2], Rodica MARGAOAN[1]

[1]University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, 3-5 Mănăștur Street, Cluj-Napoca, Romania
[2]Romanian Academy, Cluj-Napoca Section, 9 Republicii Street, Cluj-Napoca, Romania

Corresponding author email: rodica.margaoan@usamvcluj.ro

Abstract

Introduction: Cyclamen genus are part of the Primulaceae family consists of 24 species widely cultivated as ornamental and medicinal plants. They also possess high plasticity in terms of adaptability to new ecological environments. However, environmental degradation, displacement and habitat modifications along with tuber over-exploitation have exerted pressure on the native populations of these valuable ornamental species. Aims: In this paper we investigated the root architecture and plant biomass traits in 16 Cyclamen persicum accessions and 9 different Cyclamen species in order to quantify the diversity of root phenotypes, as well as correlations between traits and finally determine the influence of heat stress on trait stability. Materials and Methods: Cyclamen seeds were sown in a growing substrate containing 70% organic substances and perlite. Control plants were kept in constant temperatures between 15-20°C and heat-stressed plants between 22-30°C. Roots and aerial parts were harvested in 8 weeks. Measured root traits included: root depth and root growth rate, root fresh and dry weight, shoot fresh and dry weight, shoot:root ratio fresh weight, shoot:root ratio dry weight. Results: Out of the tested genotypes, some C. persicum accessions, C. cyprium and C. balearicum proved to be resistant to increased temperatures compared to the control. This may be due to the fact that C. cyprium and C. balearicum typically grow in Mediterranean climates with hot dry summers and warm wet winters. Furthermore, heat-stressed plants had significantly higher root lengths, as well as abundant and longer later roots compared to control. Conclusion: Maximum root diameter and root abundance presented the highest heritability depending on the genotypes adaptability to changing environments

Key words*: abiotic stress, crop tolerance, heat stress, root architecture.*

RESEARCH ON THE PRESERVATION AS CUT FLOWERS OF SOME VARIETIES OF ROSES GROWN IN THE FIELD AT UNIVERSITY OF LIFE SCIENCES IAŞI, ROMANIA

Elena-Liliana CHELARIU, Mirela COJOCARIU, Bogdan-Vlad AVARVAREI

"Ion Ionescu de la Brad" University of Life Sciences Iaşi, 3 Mihail Sadoveanu Alley, Iaşi, Romania

Corresponding author emails: mirela_c@uaiasi.ro, bogdan_avarvarei@yahoo.com

Abstract

Roses are one of the most widely used ornamental species as cut flowers. For proper use, the importance of keeping the roses as cut flowers is important. This paper presents some aspects regarding the preservation as cut flowers of two varieties of roses grown in the rosarium from Faculty of Horticulture within Iași University of Life Sciences, Romania. The experimental variants were: V1 - distilled water, V2 - benzylaminopurine, V3 - boric acid (0.05%), V4 - kinetin, V5 - preservative CHRysal Flower boost. The best results were obtained in the V5 variant, followed by V3 and V1.

Key words*: cut flowers, roses, preservation.*

STUDY REGARDING THE PHYSIOLOGICAL CHARACTERISTICS OF SOME VARIETIES OF *DAHLIA* (ASTERACEAE)

Elena-Cristina CIOBANU (ȚURLEA), Monica Luminița BADEA, Liliana BĂDULESCU, Florin TOMA

University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: ciobanuelenacristina@yahoo.com

Abstract

The study presents aspects regarding the main physiological processes in the species Dahlia hybrida, the varieties `Topmix Red`, `Thomas Edison`, `Hy Pimento`, `Babylon Red` and `Marble Ball` cultivated in `I. Todor` Botanical Garden within the University of Agronomic Sciences and Veterinary Medicine of Bucharest with drip irrigation. Physiological indicators were analyzed such as: photosynthesis, transpiration, respiration, dry matter content and water in the basal, middle and apical leaves. The LCPro+ automatic analyzer was used to measure the intensity of the photosynthesis, transpiration and respiration processes. The results obtained varied depending on the variety and the position of the leaves on the plant. The apical leaves showed a higher intensity of physiological processes, compared to the basal and middle leaves.

Key words*: photosynthesis, transpiration, respiration, dry substance.*

THE INFLUENCE OF COPPER ON SEED GERMINATION ON THE *LAGURUS OVATUS* ORNAMENTAL GRASS SPECIES

Elena-Liliana CHELARIU, Maria APOSTOL, Lucia DRAGHIA, Mirela COJOCARIU, Bogdan-Vlad AVARVAREI, Roberto BERNARDIS, Feodor FILIPOV, Petronica AMIŞCULESEI

"Ion Ionescu de la Brad" University of Life Sciences Iaşi, 3 Mihail Sadoveanu Alley, Iaşi, Romania

Corresponding author emails: bogdan_avarvarei@yahoo.com, mariabrinza2007@yahoo.com

Abstract

Lately, ornamental herbs are being used more and more in landscaping, because they have a great ecological plasticity. Lagurus ovatus is a species of annual ornamental grass, which is propagated by seeds. The current paper presents aspects regarding the influence of copper on seed germination at Lagurus ovatus species. The seed germination substrate was moistened with distilled water or copper solutions. The experiment was organized in 6 variants: V1 - control (distilled water), V2 - Cu of 50 ppm, V3 - Cu of 100 ppm, V4 - Cu of 200 ppm, V5 - Cu of 400 ppm, V6 - Cu of 500 ppm. For the experimental variants, the amount of CuSO4 required to obtain a Cu contamination of 50 ppm, 100 ppm, 200 ppm, 400 ppm and 500 ppm was calculated. The effect of copper on seed germination was assessed by germination percent, germination rate and velocity. The increase in the concentration of copper in the seed germination substrate determined the decrease of germination percentage, germination rate and velocity.

Key words*: Lagurus ovatus, copper, seed germination.*

ANATOMICAL AND PHYSIOLOGICAL CHANGES IN NEEDLES OF *PINUS NIGRA* J.F. ARNOLD REVEAL URBAN TRAFFIC AIR POLLUTION DRIVEN EFFECTS

Elena DELIAN, Elena SĂVULESCU

University of Agronomic Sciences and Veterinary Medicine of Bucharest,
59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: elena_savulescu@yahoo.com

Abstract

The presence of trees in the urban area has many advantages for improving the environmental conditions and implicitly for the urban health and wellbeing. The urban environment, in turn, can be a polluting factor that can reduce trees health and physiological performances, due to various specific environmental constraints, including pollutants resulting from street traffic emissions. In this study, the changes of needles anatomical and physiological characteristics of the Pinus nigra species grown in urban area (Dendrological Park of the University of Agronomic Sciences and Veterinary Medicine of Bucharest and Road-Side urban trees) were quantified in order (1) to establish the effect of vehicles pollution on needles anatomy, (2) to establish the effect of vehicles pollution on needles gas exchanges, and (3) to evaluate the impact on assimilatory pigments content. We found that growth conditions have had affected all needle's analyzed attributes. Our results can be added to the existing ones as regard as the P. nigra vulnerability under urban environments and its use as a bioindicator of urban pollution.

Key words: *leaf, Pinus nigra, urban pollution.*

THE IMPACT OF CHANGING THE URBAN DEPTH SOIL ON PLANT COMPOSITIONS

Elisabeta DOBRESCU, Cristina Rodica MĂNESCU, Mihaela Ioana GEORGESCU

University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: xtina.ro@gmail.com

Abstract

The research focuses on the analysis of the existing vegetation in the public perimeter of Drumul Taberei boulevard, following the construction of the underground metro line. The completion of the site resulted in public spaces with another urban footprint that requires a new approach, mainly due to the smaller existing soil substrate. 108 species / hybrids / cultivars of trees and shrubs were identified, a large part (68%) being represented by less than 10 specimens on all 4 sections studied. At the level of the vegetal carpet, out of the 80 identified herbaceous species, 11 are invasive species. Although 40% of them adapt to low nitrogen soils, 5 species have been identified (Galium humifusum, Veronica triphyllos, Amaranthus retroflexus, Alliaria petiolata, Armoracia rusticana) that grow on soils with excessive nitrogen, an important indicator for the presence of soils polluted with mineral waste. The conclusions of these analyzes led to the restructuring of the vegetal compositions using species adapted both to the thickness of the soil substrate and to the sustainable associations with the remaining species in the field.

Key words*: urban soil, plant adaptation, sustainability, inventory.*

THE DIVERSITY AND ROLE OF SMALL URBAN GREEN SPACES IN BUCHAREST

Claudia FABIAN

University of Agronomic Sciences and Veterinary Medicine of Bucharest,
59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: claudia.fabian@horticultura-bucuresti.ro

Abstract

Small green spaces in Bucharest are actively involved in maintaining urban biodiversity, although at first view these may go unnoticed. But looking carefully, in a walk-through Bucharest, we realize the importance and diversity of forms of these small green spaces and especially the plant species that obstinate to withstand often in very harsh conditions: lack of water, pollution or various interventions on urban space. The article presents the multitude of urban micro-spaces forms from street alignments to ornamental flowerpot and little green spaces without a precise destination. The paper examines the role that these small urban green spaces play in the life of the city: from the diversity of vegetation to the different forms and usages. Although we are talking about small and very small urban areas, those need to be valued and appreciated in the context to the development of the future urban green infrastructure.

Key words*: greening, small green space, green infrastructure.*

CONSIDERATIONS ON CRITERIA FOR CHOOSING ROSE CULTIVARS ADAPTED TO SOME SOILS IN RESIDENTIAL AREAS IN THE NORTH-EAST OF ROMANIA

Feodor FILIPOV, Elena-Liliana CHELARIU

"Ion Ionescu de la Brad" University of Life Sciences Iaşi,
3 Mihail Sadoveanu Alley, Iaşi, Romania

Corresponding author email: julia@uaiasi.ro

Abstract

Frequently, the soils from residential areas are strongly modified by human activities. The high heterogeneity of urban soils is due to different inputs of materials used in housing construction such as pieces of bricks, plastic, pottery, glass, crushed or dressed stone, wooden boards, bitumen etc. All these exogenous materials from urban soils are known as artefacts. Some soils are covered or isolated from the impact of the atmosphere by buildings, permeable and impermeable road surfaces such as pavement, gravel, road surfaces asphalt, concrete etc. Some of these soils, such as those covered with paved, asphalted or concrete alleys, can be crossed by plant roots and can retain water that drains to the surface and infiltrates downward and laterally into the soil. The owners of the residential spaces are interested in creating a comfortable, relaxing and pleasant environment. Various rose cultivars are some of the most appreciated plants used in private gardens in the new residential areas in the North-East of Romania. In this paper we present some results obtained after studying the influences of some urban soils on some rose cultivars grafted on the rootstock of Rosa canina and on those that grow on their own roots. We consider that these results are useful in choosing rose cultivars adapted to soil properties and for establishing measures for the rehabilitation of degraded soils.

Key words*: roses cultivars, urban soil, residential area.*

THE IMPORTANCE OF BOTANICAL SURVEY AND PROPER MANAGEMENT IN THE PROTECTION OF RARE, ENDANGERED OR VULNERABLE SPECIES OUTSIDE OF PROTECTED AREAS – WORKING EXAMPLE: *HYACINTELLA LEUCOPHAEA* (K. KOCH) SCHUR

Mihaela Ioana GEORGESCU, Adrian George PETICILĂ, Elisabeta DOBRESCU, Nicolaie COSTACHE

University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: apeticila@gmail.com

Abstract

Botanical assessment is an important tool for many scientific works which provides information that allows the accomplishing of different evaluations on plant diversity and on anthropogenic actions; it could assist human activities on ecological reconstruction or on projects of green infrastructure. Hyacinthella leucophaea is a species of Pontic-Balkan origin, listed on the National Red List of plants from 1994 and considered rare in Romania. Through our botanical surveys and reviewed literature, we added new records on distribution of Hyacinthella populations in our country. Populations in a good state can maintain this status through proper management of the land, which would reduce the pressure of external factors.

Key words*: botanical survey, country distribution, grassland management, Hyacinthella leucophaea.*

MICROPROPAGATION OF ORNAMENTAL GESNERIACEAE SPECIES AND GENETIC UNIFORMITY ASSESSMENT OF *IN VITRO* PLANTS USING SCOT MARKERS

Monica HÂRŢA[1], Doina CLAPA[1, 2]

[1]BIOCERA Research Centre, Faculty of Horticulture, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, 3-5 Mănăştur Street, 400372, Cluj-Napoca, Romania
[2]Advanced Horticultural Research Institute of Transylvania, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, 3-5 Mănăştur Street, 400372, Cluj-Napoca, Romania

Corresponding author email: doina.clapa@usamvcluj.ro

Abstract

A micropropagation protocol via direct shoot organogenesis from leaf explants of four commercial cultivars of ornamental Gesneriaceae was established in this study. The shoot induction was successfully achieved on Murashige and Skoog (MS) media supplemented with 0.2 mg L^{-1} indole-3-acetic acid (IAA) and 0.5 mg L^{-1} benzylaminopurine (BA). In proliferation stage, the effects of two combinations of PGRs (V1-0.2 mg L^{-1} IAA + 0.2 mg L^{-1} BA and V2-0.2 mg L^{-1} NAA +1 mg L^{-1} BA) on shoot number and length were examined for each species. The results suggest that PGR's combinations significantly influenced shoot proliferation in all analyzed species and among the treatments 0.2 mg L^{-1} NAA in combination with 1 mg L^{-1} BA was the most effective for in vitro shoot multiplication. The in vitro rooting percentage was 76.86-96.66% and was species-dependent. In vitro-raised plants showed a very high rate of survival (92.59-95.24%). The genetic fidelity between the selected vitro-plants and mother plants were confirmed by SCoT markers and, therefore, the propagation method proposed in this study could be applied for commercial purposes as well.

Key words*: Sinningia speciosa; Kohleria hirsuta; Streptocarpus hybridus; Saintpaulia ionantha; genetic fidelity.*

INFLUENCE OF CHANGES IN CLIMATE CONDITIONS IN THE AREA OF PLOVDIV, BULGARIA, ON PHENOLOGICAL BEHAVIOURS OF DECORATIVE SPECIES OF THE GENUS *ACER*

Valeria IVANOVA

Agricultural University of Plovdiv, 12 Mendeleev Blvd, Plovdiv, Bulgaria

Corresponding author email: valeriasi1@abv.bg

Abstract

The current study was conducted in the period 2019-2022, in the Dendrological Park of the Agricultural University - Plovdiv. The plants of the genus Acer available in the park were used, namely Acer platanoides L., Acer pseudoplatanos L., Acer campestre L., Acer negundo L., Acer saccharinum L., Acer palmatum Thunb. For comparison, information from specialized literature sources were used as controls. Phenological behaviours were recorded once a week throughout the calendar year. The moment when 50% of the plant enters the corresponding phenophase was considered to be the occurrence of the respective phenophase. The following phenophases were observed: swelling of buds, beginning of leafing, visible leaf blades, beginning of flowering, mass flowering, end of flowering, duration of flowering of a single flower, duration of flowering of the whole plant, appearance of typical summer leaf color, appearance of autumn leaf layering, appearance of typical autumn leaf coloring, seed ripening, beginning of fall, mass fall and end of fall. It was found that the most sensitive to rising temperatures and lowering relative humidity during the growing season are Acer negundo L. and Acer palmatum Thunb., especially with regard to the phenophases associated with the autumn behaviours of plants - autumn layering and coloring of leaves and leaf fall. These phenophases in the mentioned species occur 1.7 to 3.4 days earlier. The phenophases related to flowering and the duration of the flowering period of the individual flower and the whole plant are most affected by climate change in Acer platanoides L., Acer pseudoplatanos L. Most resistant to global warming and the most stable and unchanging phenophases is Acer campestre L.

Key words*: Acer, phenological behaviours, climate changes.*

STUDY OF THE POSSIBILITIES FOR IMPROVING THE SOWING QUALITIES OF SEEDS AND THE VITALITY OF SEEDLINGS FROM *CRYPTOMERIA JAPONICA* DON. THROUGH PRE-SOWING TREATMENT WITH ULTRASOUND

Valeria IVANOVA, Martin STOILOV

Agricultural University of Plovdiv, 12 Mendeleev Blvd, Plovdiv, Bulgaria

Corresponding author email: valeriasi1@abv.bg

Abstract

Recently, in the production of planting material from ornamental species of trees and shrubs from seeds, more and more attention is paid to various physical methods aimed at increasing the germination and viability of seeds in difficult to propagate species. One of these methods is pre-sowing treatment of seeds with ultrasound. The present study was conducted to determine the effect of ultrasound on the germination and viability of seeds of ornamental species of Cryptomeria (Cryptomeria japonica D. Don.). The experiments were set in the laboratory of the Department of Horticulture, Agricultural University Plovdiv. The experiment with Cryptomeria was conducted from the end of February to the beginning of August. Variants with 5, 10, 15 and 20 minutes exposure were studied. Untreated seeds were used for control. Indicators related to the growth and phenological manifestations of plants were studied. It was found that the treatment of seeds with ultrasound affects the sowing qualities of the seeds of the studied specie. Ultrasound treatment has a beneficial effect on germination in Cryptomeria, with the optimal exposure being 20 minutes - so germination increases by 11% compared to control.

Key words*: Cryptomeria, seed propagation, ultrasound treatment, germination, ornamental plant.*

GREEN WALL IMPACT ON BENEFICIAL INSECTS IN AN URBAN FRUIT ECOSYSTEM

Elena Stefania IVAN[1], Roxana CICEOI[1], ANA Cornelia BUTCARU[1], Ana Maria STANCIU[2], Florin STĂNICĂ[2]

[1]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: elena.ivan@qlab.usamv.ro

Abstract

Green walls in urban environment are a component of urban green infrastructure and contribute to a range of ecosystem services including habitat provision for urban biodiversity, screening out the dust and other primary and secondary pollutants, improving air quality, attenuating noise, and aesthetics of the urban environment. The most representatives of biodiversity in urban green landscapes are the insects, represented by pollinators, beneficials, but also pests. Whether pollinators or predators, these insects will help manage pests and keep the city green spaces healthy. The green wall is located in the experimental fruit field of the Faculty of Horticulture within USAMV Bucharest, at the border between the vineyard and the ecological sector, cultivated with apple. Observations were made on its impact on beneficial insects, as pollinators, hoverflies (Diptera), ladybirds (Coleoptera), parasitic wasps (Hymenoptera), butterflies and moths (Lepidoptera), lacewings (Neuroptera), ground beetles (Coleoptera, Carabidae). The preliminary results indicate that among the best climbing plants used for green walls, Lonicera japonica, Hedera helix, Parthenocissus quinquefolia, Akebia quinata, and Campsis radicans attract the beneficial insects such as pollinators or aphid eaters.

Key words*: Green wall, wild flowers, organic apple, biodiversity, pollinators.*

MYCORRHIZATION OF *CORYLUS AVELLANA* L. AND *QUERCUS ROBUR* L. SEEDLINGS WITH *TUBER AESTIVUM* VITTAD.

Endre KENTELKY, Zalán LUKÁCS, Tekla Amália LUNKA, Klára BENEDEK, Erzsébet DOMOKOS, Barna PUTNOKY-CSICSÓ, Zsolt SZEKELY-VARGA

Sapientia Hungarian University of Transylvania, Faculty of Technical and Human Sciences, Department of Horticulture, Sighișoarei 1C, 540485, Târgu Mureș, Romania

Corresponding authors emails: szekelyvarga.zsolt@gmail.com, tekla.lunka@gmail.com

Abstract

Mycorrhization could be a valuable tool in order to produce a remarkable and a high economical interest mushroom. Corylus avellana L. and Quercus robur L. are known as mycorrhizal hosts for Tuber aestivum Vittad. (Truffle). Cultivating truffles, is important to know the necessary pH level of the soil, on which the mycorrhization occurs. The selected tree species are known to have a high percentage of inoculation level under the effect of truffle spore inoculum. In the study, seedlings of the previously mentioned species were subjected to truffle infection at three soil pH levels (7.3, 7.5, 7.7). During the experiment two different weight of truffle and two inoculation methods (soil-inoculation and inoculation with suspension) were tested. Our results show that significant changes were obtained at 7.5 pH level, when the weight of the truffle added to the roots influenced the mycorrhization level in a positive way, and also inoculation method significantly influenced the T. aestivum appearance. In conclusion, our data suggests that Common hazel and European oak mycorrhization occurred, yet it is important to ensure the necessary growth requirements for a greater and higher quality production of truffles.

Key words*: bonitation score, inoculation pH, symbiosis, truffle.*

PERCEPTION AND ASSESSMENT OF FRUIT TREES VISUAL QUALITY DURING SPRING IN PUBLIC GREEN SPACES AND PRIVATE GARDENS

Andreea MELINESCU[1], Sina COSMULESCU[2]

[1]University of Craiova, Faculty of Horticulture, Doctoral School of Plant and Animal Resources Engineering, 13 A.I. Cuza Street, 200585, Craiova, Romania
[2]University of Craiova, Faculty of Horticulture, Department of Horticulture and Food Science, 13, A.I. Cuza Street, 200585, Craiova, Romania

Corresponding author email: melinescu93@gmail.com

Abstract

Fruit trees are valuable components in the ecosystem, having both aesthetic and utilitarian functions. This study focuses on assessing the aesthetic aspects of fruit trees during spring, using the expert based paradigm and the perception based paradigm. The Scenic Beauty Estimation method is used to measure the visual quality, but also five landscape parameters: vitality, harmony, fascination, naturalness and colour diversity. Such studies are important for better urban planning, fruit trees proving to increase the visual quality in public green spaces and private gardens, through its decorative elements, such as flowers. The integration of fruit trees in the landscape it is a necessity in creating a sustainable landscape.

Key words*: fruit trees aesthetic, landscape aesthetic, visual quality, urban planning.*

BEHAVIOUR OF ORNAMENTAL SPECIES *NIPPONANTHEMUM NIPPONICUM* IN CROPPING CONDITIONS FROM SW AREA OF ROMANIA

Manuela MANDA, Carmen NICU

University of Craiova, Faculty of Horticulture, 13 Al. I. Cuza Street, Craiova, Dolj, Romania

Corresponding author email: alexa25nicu@yahoo.com

Abstract

Nipponanthemum nipponicum (Franchet ex Maxim.) Kitam., originating in Japan, is part of the hemicryptophyte perennial group. It is a valuable plant and it is noticeable by the fact that it blooms in a period when most of the flowering species end their period of decoration (September-November). In our country N. nipponicum is not known as an ornamental plant and has not been mentioned in any scientific work. As a result, in this paper we have proposed the study of the behavior in culture in order to introduce this species into the assortment. In Craiova city conditions, the flowering was observed at the beginning of October (4.10.) and the decoration duration was between 25 - 36 days. Analyzing the behavior of N. nipponicum plants under different cultivation conditions, it is observed that the plants grown in the sunny exhibition recorded the best results for all the analyzed parameters.

Key words*: assortment, diversification, Nipponanthemum nipponicum, ornamental plant.*

RESEARCH ON MODULAR HORTIVOLTAIC SOLUTIONS

Gabriel Cristian MILOȘ, Mihaela Ioana GEORGESCU, Sorina Aurelia PETRA, George Adrian PETICILĂ, Nicolaie COSTACHE, Florin TOMA

University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: jumboromania@gmail.com

Abstract

The present paper aims to document and identify some possible modular hortivoltaic solutions, which efficiently combine horticultural production with the generation of photovoltaic electricity on smaller spaces than usual in agrivoltaic applications. This initiative involves the development of structures to support photovoltaic panels, under which horticultural species can be grown in containers of different sizes and whose irrigation is carried out in a significant proportion with the help of rainwater collected from the surface of photovoltaic panels. At the same time, an assessment will be made of the potential of green energy generated by the photovoltaic panel modules with the presentation of some species that can be cultivated for utilitarian and ornamental purposes. The solutions resulting from the synergy generated by the combination of photovoltaic panels - green roofs will be able to be generalized and recommended in a wide range of situations, thus responding to the current needs of resource reuse and combating climate change.

Key words*: Agrivoltaics, hortivoltaics, container gardens, carbon reduction, rainwater reused, terraces.*

BIRCH SAP HARVESTING IN VARIABLE WEATHER CONDITIONS OF EASTERN EUROPEAN SPRING

Cristina Rodica MĂNESCU[1], Miruna Elena TUDORACHE[2], Gabriel DANILA[2], Paul ILIESCU[2], Valerian SIMIONIUC[2], Elisabeta DOBRESCU[1], Aurelia Sorina PETRA[1], Florin TOMA[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Marasti Blvd, Bucharest, Romania
[2]"Ştefan cel Mare" University of Suceava, 13 University Street, Suceava, Romania

Corresponding author email: cristina.manescu@horticultura-bucuresti.ro

Abstract

The collection of birch sap in spring has become, in the past decades, a regular practice in Romania, because of its multiple health benefits. Over the years, many collectors experienced unsatisfactory results in terms of the amount of sap harvested, usually attributed to the unpredictable spring weather of some years, with large variations from a day to another. The results of this study revealed that independently of weather conditions in spring, the best period of sap harvesting in NE Romania is between 25 March - 5 April, when the air temperatures did not exceed 15°C. Trees higher than 20 m, older than 30 years, were most productive. At the end of the growing season, tapped trees were smaller.

Key words*: Betula pendula, birch sap, climate, growth, sap production.*

MORPHOLOGICAL AND PHENOLOGICAL VARIABILITY OF SOME VARIETIES OF GLADIOLUS CULTIVATED UNDER CLIMATIC CONDITIONS OF CRAIOVA

Carmen NICU, Manuela MANDA

University of Craiova, Faculty of Horticulture, 13 Al. I. Cuza Street, Craiova, Romania

Corresponding author email: manda_manu@yahoo.com

Abstract

The study was carried out to evaluate the variability of some morphological characteristics in six cultivars of gladiolus, 'Blue Frost', 'Green Star', 'Nova Lux', 'Peter Pears', 'Priscilla' and 'Purple Flora', cultivated in the climatic conditions of Craiova city, Romania. The results showed that the minimum number of days from planting to flowering and the maximum plant height, number of leaves per plant and spike length were recorded in 'Green Star' cultivar, which was superior to the other cultivars. 'Nova Lux' performed the best for the number of florets per spike (16.5), and 'Blue Frost' for the diameter of floret (12.26 cm), wich are important quality indicators. Among the cultivars 'Purple Flora' and 'Priscilla' had the longest flowering duration. The coefficient of variation in terms of vegetative and flowering parameters, ranged between 7.75% for the number of leaves per plant and 19.89% for the number of florets in inflorescence. The highest coefficient of variation was obtained for the flowering duration (23.73%).

Key words: *cultivar, flowering duration, morphological characteristics.*

REHABILITATION OF THE DENDROLOGICAL PARK IN BUHUSI, BACAU COUNTY

Roxana PAȘCU, Cristina ZLATI, Roberto BERNARDIS

"Ion Ionescu de la Brad" University of Life Sciences Iași,
3rd Mihail Sadoveanu Alley, Iaşi, Romania

Corresponding author email: ing.dr.roxana@gmail.com

Abstract

The idea of rehabilitation proposed in the present project presented in this paper aims primarily to capitalize on green spaces in the park located in downtown Buhusi, increase the area of land legally framed as green space, giving up some parasitic elements such as basketball court on the territory park, increased accessibility and the creation of the best conditions to cover the need for relaxation, culture and education of all categories of population without discrimination.
The rehabilitation solution proposes a completely new architectural concept with landscape elements - defining the organic style. The arrangement scenario consists of free, sinuous shapes meant to create a harmonious, balanced rhythm and to strengthen the feeling of space. The interior of the proposed rehabilitation solution is intended to provide a gradual transition between the various functional areas of the park.
The vegetation will consist of small shrubs and conifers arranged in clusters that grow in decorative terraces throughout the year. The arrangement of deciduous and coniferous trees will be made so that the colour offered is diverse in all seasons.

Key words*: composition, dendrological, park, rehabilitation.*

COULD CACTUSES ENDURE WINTER IN ROMANIAN CLIMATIC CONDITIONS?

Zsolt SZEKELY-VARGA[1], Artúr-Botond CSORBA[1], Katalin MOLNÁR[1], Martin IAKAB[2,1], Béla BIRÓ-JANKA[1], Endre KENTELKY[1,*]

[1]Sapientia Hungarian University of Transylvania, Faculty of Technical and Human Sciences, Department of Horticulture, Sighișoarei 1C, Târgu Mureș, Romania
[2]University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Faculty of Agriculture, 3-5 Calea Mănăştur, Cluj-Napoca, Romania

Corresponding author emails: kentelky@ms.sapientia.ro, molnarkati@ms.sapientia.ro

Abstract

Cacti are one of the most interesting group of plants, because of their unique and special way of life. Due to their impressive beauty of their flowers and spines, are used nowadays as potted plants in different areas beside their native habitat. Moreover, for this reason growers are testing their amelioration to frost endurance. Frost resistant at is a complex physiological trait with a genetic basis. For the present study we have selected ten cacti species as followed: Cylindropuntia imbricata, Cylindropuntia whipplei, Opuntia basilaris, Opuntia fragilis, Opuntia polyacantha, Opuntia rutila, Echinocereus coccineus, Echinocereus reichenbachii var. baileyi, Escobaria leei and Escobaria vivipara var. radiosa on which we have analysed the damages caused by frost and winter injuries. The selected cacti species were subjected to two experimental conditions, first, when plants were covered and second, when remained uncovered. Results indicated that frost hardiness of some species was greatly influenced by the coverage, while at other no differences were observed. In conclusion, the present work strengthens the possibility of using some of the cacti species in the Romanian landscape design.

Key words*: bonitation score, cacti, frost resistant, coverage.*

PARTIAL RESULTS REGARDING THE DETECTION AND IDENTIFICATION OF PATHOGENS ON DENDROFLORIC PLANTS IN DIFFERENT GREEN SPACES OF CRAIOVA MUNICIPALITY

Theodora SĂLCUDEAN (IONIȚĂ), Rodi MITREA

University of Craiova, Faculty of Horticulture, 13 A.I. Cuza Street, Craiova, Romania

Corresponding author email: theodorrys13@gmail.com

Abstract

The purpose of the study in this paper was to detect and identify pathogens in some dendrofloric plants in different green spaces of Craiova. The detection and identification of the attack of different phytopathogens consisted both in periodic visual observations in the experimental area on certain organs of the host plants that showed symptoms of disease, and in performing laboratory tests. Regarding the detection of certain bacterial diseases, in the monitored period, following bacteria were identified: Agrobacterium tumefaciens, Erwinia carotovora, Pseudomonas marginalis, Xanthomonas hyacinthi, Xanthomonas campestris pv. campestris, Xanthomonas hortorum pv. pelargoni. For proper identification, not only macroscopic observations, but also laboratory tests are required to certify the initial identification in the field and, where possible, a pathogenicity test on susceptible plants was performed, obtaining the reproduction of the disease in the test plants.

Key words**:** *observation, test, isolation, detection, identification.*

EFFECT OF SALINITY STRESS ON SOME PHISIOLOGICAL INDICES OF WHITE CLOVER (*TRIFOLIUM REPENS)*

Daniela VĂLUȘESCU, Mihaela MOATĂR, Giancarla VELICEVICI, Neculai DRAGOMIR, Tiberiu IANCU, Cosmin Alin POPESCU, Dorin CAMEN

Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timişoara, 119 Calea Aradului, Timișoara, Romania

Corresponding author email: camendorin@yahoo.com

Abstract

Salinity is an factor which has a critical influence on seed germination and plant establishment. During the present study the effect of salinity on seeds germination, seedling growth and chlorophyll content of Trifolium repens was studied. Experiments were conducted in laboratory condition. The salinity was induced using three concentration of NaCl (0mM NaCl, 40mM and 80mM). Determinations were recorded in three periods, after (3, 10 and 17 days) and were analysed percentage of germination, MDG and DGS, seedling growth and chlorophyll content. In normal condition Trifolium repens showed highest percentage of germination 79,33%, while in stress salt condition percentage of germination was reduced in proportion to the increase in saline concentration. In salt stress condition we observed that the mean daily germination (MDG) decreased, while daily germination speed (DGS) increased. The effect of the NaCl concentration on the growth in the clover seedlings they showed values between 2,372 cm on the V3 variant and 3,603 cm on the Vo variant. The application of treatments that induced saline stress led to a significant decrease in growth in proportion to the level of differences between treatments. Referring to the effect of the environment on the accumulation of chlorophyll, it was observed that the chlorophyll content decreased under conditions of saline stress (24,15SPAD). Salt tolerance data may be used to select clover with the highest potential for agronomic production.

Key words*: clover, salt stress, germination, chlorophyll content.*

SOME ASPECTS REGARDING THE PROPAGATION BY CUTTINGS OF ORNAMENTAL SPECIES ON DIFFERENT ROOTING SUBSTRATES

Diana VÂȘCĂ-ZAMFIR[1], Cristian Mihai POMOHACI[1], Ovidiu Ionuț JERCA[2]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: cristian.pomohaci@fifim.ro

Abstract

Plants, as intelligent organisms, have developed mechanisms for survival, which humans have studied and used to expand the methods of multiplication of various categories of plants. In the field of ornamental plants one of the most common method of propagation is the vegetative method by cuttings. In the present work, the testing of the most commonly used rooting substrates (sand, perlite, peat, peat mixed with perlite 1:1) for the top cuttings of shoots of some indoor ornamental species, decorative by flowers and leaves (Nerium oleander, Pelargonium odoratissimum, Croton variegatus, Hypoestes sanguinolenta, Coleus hybridus) continued. The parameters analysed to evaluate the efficiency of the rooting substrate were some biometric characteristics the average length of the main root and the average length of shoots together with the rooting percentage. For the statistical interpretation of these parameters, the IRP (index of Root and Peak) indicator was developed. The consistency of the IRP indicator was analysed using the Alpha Cronbach coefficient.

Key words*: cuttings, rooting substrates, Alpha Cronbach.*

BIBLICAL GARDENS AT CHEIA MONASTERY DOMAINS

Ana VIȚA, Vladimir BOC

University of Agronomic Sciences and Veterinary Medicine of Bucharest,
59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: ana.vita1995@yahoo.com

Abstract

The paper deals with the research and valorisation of the relationship between sacred spaces and forest landscapes through the insertion of biblically-themed gardens into a 20 ha monastic domain, surrounded by the forests of Cheia mountain resort, located in central Romania. The site is crossed by a natural water course with two ponds and comprises a series of mixed tree groups and groves, increasing the landscape diversity of Cheia Orthodox Monastery area. The first stage of the project consisted in a complex research of the site from a cultural, historical, functional, ecological and visual point of view. Following the site assessment, a landscape redevelopment strategy has been proposed through minimal interventions. It is intended to introduce biblical thematic gardens focused on the conservation of the dendrological vegetation, on the valorisation of the local ambiances through visual and functional integration of the site in the context of the mountain forest landscape and Cheia resort. The proposed vegetation presents a distinct symbolic value in each thematic area that confers a particular visual identity and a specific spiritual role. The conclusions reveal the high potential of the site from visual, environmental and touristic point of view. The opportunity to increase the attractiveness of the monastic domain is highlighted by inserting multiple uses, such as educational, religious, cultural, recreational etc.

Key words*: Bibllical gardens, Cheia Monastery, landscape design, landscape analysis.*

USING FRUIT GROWING SPECIES FOR GREEN ROOFS

Cristina ZLATI, Roxana PAȘCU, Roberto BERNARDIS

"Ion Ionescu de la Brad" University of Life Sciences Iași,
3rd Mihail Sadoveanu Alley, Iaşi, Romania

Corresponding author email: ing.dr.roxana@gmail.com

Abstract

Green roofs are a way of landscape development that combines aesthetics with ecological functions of these types of facilities. The sustainability of this approach lies in combining economic, aesthetic and especially functional, making them the primary aspects anchored in determining the choice of the most suitable crop systems. Romania is an European country where culture tree species with ornamental value is well represented by a great diversity of species and varieties that are favorable climatic conditions for growth and flowering, while ensuring décor staggered throughout the year.
A difference from the landscaping from the ground is that the arrangements of roofs and terraces rarely work with plants decorative through flowers, such as the use of tree species is more than appropriate in this case.
Extending the concept of Green Roof has advantages in terms of encouraging environment, educational system and the community life, fostering solidarity population to achieve a framework for proper management of long-term spaces.
Implementing the concept of green roofs in public areas can be very successful, both in the short and long term, primarily by reducing pollution and improving the aesthetics of such spaces furnished.
Diversification research in this area and finding new techniques for obtaining more efficient and rapid production of a higher quality is one of the current priorities of food safety programs.

Key words*: green roof, sustainability, substrate, strawberry, optimization.*

MISCELLANEOUS

TRICHODERMA SPP. - MECHANISMS OF ACTION IN THE CONTROL OF STORAGE ATHOGENS - REVIEW

Angela Cristina AMUZA[1, 2], Roxana ZAHARIA[1]

[1]Research and Development Institute for Plant Protection Bucharest, 8 Ion Ionescu de la Brad, District 1, Bucharest, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: angela.amuza@yahoo.com

Abstract

Aim: The purpose of the paper is to revise the multiple methods of biological control of Trichoderma spp. The need to reduce the use of fungicides in phytosanitary control and makes it necessary to develop technologies that allow easy, economical and effective ways to obtain products from endogenous microorganisms with sufficient quality and quantity to their application in the crops areas. In addition to the industrial importance of the genus, certain Trichoderma species have the ability to antagonise plant pathogens. Trichoderma interacts with other microorganisms, but mainly with pathogenic fungi. These interactions include hyperparasitism, competition, and antibiosis. Hyperparasitism is connected with the direct contact of an antagonist with a pathogen and is composed of such stages as: pathogen recognition, attack, gradual penetration of the pathogen cells and death. Contamination of crops with phytopathogenic genera such as Fusarium, Aspergillus, Alternaria, and Penicillium usually results in mycotoxins in the stored crops and are designated as the most devastating species for small grain cereals.

Key words: *biological control, phytopathogens, Trichoderma spp.*

RESULTS OBTAINED BY INVESTIGATING PUMPKIN (*CUCURBITA MAXIMA* L.) USSING FT-IR SPECTROSCOPY

Luisa ANDRONIE[1], Levente MÀTHE[2], Ancuţa ROTARU[1]

[1]University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, 3-5 Mănăștur Street, Cluj-Napoca, Romania,
[2]ITIM, 67-103, Donat, Cluj-Napoca, Romania

Corresponding author email: luisa.andronie@usamvcluj.ro

Abstract

Pumpkin, fruit of certain varieties of squash—such as varieties of Cucurbita pepo, C. moschata, and C. maxima—in the gourd family (Cucurbitaceae), usually characterized by a hard orange rind with distinctive grooves. Pumpkin (Cucurbita maxima L.) has considerable economic importance, generating huge amounts of seeds and peels. Although peels have no final application, they contain high amounts of tocopherols and five times more carotenoids than seeds. Pumpkins are commonly grown for human consumption, for decoration, and also for livestock feed Because, the pumpkin is cultivated in many countries having very important medical properties is necessary experimental studies. Also, pumpkin is mainly served as a vegetable and used interchangeably with other winter squashes. Vibrational spectral techniques, FT- IR, offer several advantages in the context of current research and using this techniques we can identify molecular components in the samples studied. IR spectroscopy is based on the absorption of radiation in the 400 – 4000 cm–1 range which excites molecular vibrations. Our research had the objective of analized a vibrational spectra of pumpkin seeds and pumpkin flour , using a method which is based on microscopic infrared study (FT-IR).

Key words*: Pumpkin (Cucurbita maxima L.), FT-IR (Fourier transform infrared).*

IMPROVING AND DIVERSIFYING THE CHICKPEA GERMPLASM COLLECTION FOR SUSTAINABLE USE IN BREEDING AND AGRI FOOD CHAIN

Creola BREZEANU, Petre Marian BREZEANU, Silvica AMBĂRUȘ, Mariana CALARA, Alexandru BUTE, Andreea ANTAL TREMURICI, Dan AVASILOAIEI

Vegetable Research and Development Station Bacau,
220 Calea Bârladului Street, Bacau, Romania

Corresponding author emails: brezeanumarian@yahoo.com, creola.brezeanu@yahoo.com

Abstract

Food legumes are crucial for key agriculture-related challenges, such as agrobiodiversity conservation, sustainable agriculture, food security and human health. Comparing to other grain legumes species, chickpea is considered one of the most nutritious for human consumption, having no antinutritional factors except the raffinose-type oligosaccharides, but proven health benefits. One of the major objectives of breeding programs is development of high-yielding, early-maturing cultivars suitable to short cropping season. The current study was developed in frame of national project in ADER program 2019-2022 and had as aim the improvement and diversification of chickpea germplasm collection to ensure the optimal use of genetic resources, as a precondition to increase the crop sustainability. The narrow genetic base of cultivated chickpea is one of the major obstacles to sustaining and improving its productivity and renders the crop vulnerable to new biotic and abiotic stresses. In-situ conservation is based on empirical principles and on-farm conservation activities are marginally developed. Seed collections are assembled and are maintained on accession basis, where each accession usually comprises a mixture (population) with an unknown composition of genotypes. This study monitored neutral and functional diversity both at the genetic and phenotypic levels, which means characterizing it, investigating its interactions with the environment in order to define useful functional variation in given environments, establishing a link between variation of phenotypes and biomarkers to predict potentiality of accessions for specific breeding goals. Plant genetic resources comprising landraces, obsolete varieties and crop wild relatives were investigated. Performance has been achieved by applying new approaches for germplasm characterization and evaluation like development of core sets, mini-core sets, reference sets and trait-specific subsets, etc. Better utilization and conservation of these accessions raises substantial challenges due to the genetic changes that can be occurring during seed multiplication.

Key words*: biodiversity, Cicer, nutritional profile, quality traits.*

ASPECTS REGARDING THE ANATOMY AND COMPOSITION OF THE VOLATILE OIL IN THE *ARTEMISIA ABSINTHIUM* L. (ASTERACEAE) ECOTYPES FROM ROMANIA

Monica Luminiţa BADEA

University of Agronomic Sciences and Veterinary Medicine of Bucharest,
59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: badea.artemisia@gmail.com

Abstract

Artemisia absinthium (Asteraceae) is considered a medicinal plant with anti-inflammatory, antiseptic, anthelmintic, antitumor, stomachic and cholagogue action. Anatomical observations were made on cross-sections in the leaves of Artemisia absinthium L. (Asteraceae). The epidermis is made up of cells with a weakly thickened and slightly cutinized outer wall, the mesophile is differentiated into palisade and lacunar tissue. Numerous tectory hairs have been observed on both epidermis (upper and lower), and in the depressions of the lower epidermis there are multicellular secretory hairs. The analysis of the volatile oil was performed during the flowering period, the plants come from different areas. The oil has been extracted by hydro distillation and analyzed by gas chromatography – mass spectrometry (GC-MS). The main chemical compounds observed in the volatile oil include sabinen (28.95%, ecotype Ulmeni), α-felandren (11.43%, ecotype Dragoslavele), β-pinene (25.53%, ecotype Corbii Mari), linalool (13.98%, ecotype Ulmeni), β-thujona (8.97%, ecotype Dragoslavele).

Key words*: oil volatile, ecotype, secretory hairs.*

ORGANIC SOURDOUGH MINI BAGUETTE FORTIFIED WITH JERUSALEM ARTICHOKE FLOUR, FOR DIABETICS

Luminiţa CATANĂ[1], Monica CATANĂ[1], Anda-Grațiela BURNETE, Florica CONSTANTINESCU[1], Adrian Constantin ASĂNICĂ[2]

[1]National Research & Development Institute for Food Bioresources, IBA Bucharest, 6 DinuVintila Street, Bucharest, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: mcatana1965@gmail.com

Abstract

Fermentation of the dough with sourdough cause the improvement of the sensory and nutritional qualities of bakery products. Also, sourdough bakery products (in a longer fermentation process) are digested more slowly in the human body, which causes a lower glycemic impact on the human body. This paper presents the research results undertaken to obtain the organic sourdough mini baguette fortified with Jerusalem artichoke flour, for diabetics. This product has superior sensory qualities, high nutritional value, has antioxidant capacity and low glycemic index, being in the diet of diabetics. Thus, the mini baguette fortified with jerusalem artichoke flour, is distinguished by the content in mineral elements (K: 245.17-260.85 mg/100 g; Ca: 136.21-145.21 mg/100 g; Mg: 90.02-98.45 mg /100 g; Fe: 1.88-1.97 mg/100 g; Zn: 1.47-1.56 mg/100 g), total fiber (8.94-9.75 mg/100 g), total polyphenols (115.75-118.98 mg GAE/100 g). Also, this bakery product has antioxidant capacity (125.43-128.65 mg Trolox/100 g) and has low content in available carbohydrates (39.24-38.15%). The use of sourdough in the organic mini baguette composition ensures its freshness and microbiological stability for a period of at least 4 days. The use of sourdough as a natural fermentation agent and Jerusalem artichoke flour as a fortifying agent ensures a mini-baget with superior sensory qualities, high nutritional value and antioxidant capacity, which can be used in the prevention and diet therapy of diabetes.

Key words*: mini baguette, sourdough, Jerusalem artichoke flour, organic, diabetics.*

FORTIFICATION OF BISCUITS WITH CARROT POMACE POWDER IN ORDER TO INCREASE THE NUTRITIONAL VALUE AND ANTIOXIDANT CAPACITY

Monica CATANĂ[1], Luminița CATANĂ[1], Adrian Constantin ASĂNICĂ[2], Monica-Alexandra DÂRĂ[1], Florica CONSTANTINESCU[1]

[1]National Research & Development Institute for Food Bioresources, IBA Bucharest, 6 DinuVintila Street, Bucharest, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: adrian.asanica@horticultura-bucuresti.ro

Abstract

Carrot pomace powder is stands out by its content in protein, minerals, ß-carotene, vitamin C, B vitamins (vitamin B3, vitamin B6), vitamin E and polyphenols. The aim of this study was to fortify the biscuits with carrot pomace powder, in order to increase their nutritional value and antioxidant capacity. Fortified biscuits have superior sensory qualities and have a complex biochemical composition, beeing noticed by their protein content (11.22%), total fiber (10.90%), potassium (435.55 mg/100 g), calcium (185.47mg/100 g), magnesium (127.68 mg/100 g), iron (2.26 mg/100 g), zinc (1.72 mg/100 g)), total polyphenols (260.75 mg GAE /100 g), β-carotene (1.30 mg/100 g). At the same time, the fortified biscuits with carrot pomace powder have antioxidant capacity: 338.23 mg Trolox/100 g. Due to the addition in the composition of biscuits of dietary fiber with antioxidants, both the increase in nutritional value and the increase in their minimum durability are obtained. The minimum shelf life of fortified biscuits is 25 days. Using differential scanning calorimetry, it was found that fortified biscuits have a lower enthalpy value compared to control biscuits. Thus, it can be concluded that carrot pomace powder delays the starch downgrade (which is equivalent to an increase in shelf life). The fortification of carrot pomace powder biscuits ensures the improvement of their sensory, nutritional quality and microbiological stability.

Key words*: carrot, pomace, powder, biscuits quality, antioxidant capacity.*

GREEN EXTRACTION METHODS APPLIED ON *NANNOCHLOROPSIS* SP. BIOMASS - A REVIEW

Carmen Gabriela CONSTANTIN, Cătălina Ioana NICOLAE, Aurora DOBRIN, Andrei MOȚ

Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: auroradobrin@yahoo.com

Abstract

Nannochloropsis sp. is microalgae of particular interest for the production of lipids containing omega-3 - fatty acids, specifically eicosapentaenoic acid (EPA), a fatty acid mostly found in the flesh of cold-water fish and crustaceans with high importance in human health. Because of the rigid cell wall structure of Nannochloropsis sp., the extract of EPA requires specific methods. There are certain critical points regarding lipidic extraction: the application in food and feed, and the fractionation methods that provide a high recovery rate of EPA. Therefore, green extraction methods have recently gained more and more interest, having minimal environmental and health impacts, as they use less or no organic solvents, being sustainable productive, and efficient. The methods used for lipid extraction should ensure that during the process, the lipid extraction is obtained without influencing the fatty acid composition. The purpose of this review is to summarize the existing research parameters regarding different green extraction methods applied for obtaining lipid fractions, with emphasis on supercritical fluid extraction, ultrasound-assisted extraction, and accelerated solvent extraction methods.

Key words*: eicosapentaenoic acid, fractionation methods, microalgae.*

EVALUATION OF ANTIMICROBIAL ACTIVITY OF *CARTHAMUS TINCTORIUS* EXTRACTS AGAINST NOSOCOMIAL MICROORGANISMS

Aurora DOBRIN[1], Gabriela POPA[2]

[1]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, Faculty of Horticulture, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: popagabiro@yahoo.com

Abstract

Drug-resistant pathogens are the main cause of health-associated infections. They continue to significant infections, increase mortality of the hospitalized patients and also have a negative financial impact. Taking into consideration those factors, there is a great need to find and develop new compounds with low toxicity, specific activity, and high bioavailability to combat them. In this way have increased the attention on medicinal plants and their bioactive compound with antimicrobial properties. Antimicrobial activities of the crude ethanolic extracts from seeds, leaves, and flowers of Carthamus tinctorius (safflower) were screened against multidrug resistant (MDR) strains of Escherichia coli, Candida albicans, Staphylococcus aureus, Staphylococcus epidermidis and Enterococcus faecalis, all these pathogens being involved in nosocomial infections. The results showed that the antimicrobial activity depends on the variety and on part of the plant that has been used. The most potent antimicrobial activities were as follows: flowers against C. albicans and S. aureus, leaves against S. epidermidis and E. coli, seeds against E. coli and E. fecalis. This study concludes that safflower extracts might be used against multidrug resistant microbes that causes nosocomial and community acquired infections.

Key words*: bacteria, drug-resistant, extracts, pathogens, safflower.*

PROCESSING METHODS USED FOR ORGANIC VEGETABLE CHIPS - REVIEW

Mihai FRÎNCU[1], Andreea BARBU[2], Violeta Alexandra ION[2], Andrei PETRE[2], Liliana BĂDULESCU[1, 2]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania
[2]Research Center for Studies of Food Quality and Agricultural Products, Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: andreea.stan@qlab.usamv.ro

Abstract

Due to their compounds and their beneficial properties for the body, vegetables are important ingredients in a balanced daily diet. By definition, vegetables are edible parts of the plant that can include: stems, roots, tubers, bulbs, leaves, flowers and beams. It is recommended to eat fresh vegetables, but when this is not possible, they can be preserved in various forms. One of the oldest techniques for preserving vegetables is drying, which involves reducing the water content of vegetables by exposing them to the sun or artificial heat sources. Dried vegetables are produced by different processes. In general, dried vegetables follow the same steps: selection of vegetables according to their shape and quality, peeling, slicing, preservation, dehydration (natural or artificial), sweating or salting, visual inspection and packaging. Drying is beneficial because it extends the shelf life, reduces postharvest waste, and massively helps reduce storage and transportation costs. This article reviews various methods of pre-processing of organic vegetables (cutting forms, different forms of bleaching, etc.) and different drying methods (classic by varying the temperature, vacuum, etc.). ACKNOWLEDGEMENTS: This work was supported by a grant of the University of Agronomic Sciences and Veterinary Medicine of Bucharest, project number 2021-0031/14.07.2021, acronym EcoLegDry, within IPC 2021.

Key words*: organic, vegetables, drying, chips.*

STATE OF THE ART OF KNOWLEDGE TRANSFER IN AGRICULTURE IN THE WESTERN BALKANS AND EU

Alisa HADŽIABULIĆ[1], Silva GROBELNIK-MLAKAR[2], Miljan CVETKOVIĆ[3]

[1]University `Džemal Bijedić` of Mostar, S. logor bb, Mostar, Bosnia-Herzegovina
[2]University of Maribor, Slomškov trg, Maribor, Slovenia
[3]University of Banja Luka, Faculty of Agriculture, Bulevar vojvode P. Bojovića 1a, Banja Luka, Bosnia-Herzegovina

Corresponding author email: alisa.hadziabulic@unmo.ba

Abstract

Digital technologies - including the Internet, social media, mobile technologies and devices, digitally-delivered services and apps, ecommerce, data analytics, precision agriculture, remote sensing technologies, robotics and autonomous systems – are changing agriculture and the food system. Digital agriculture can be applied to all aspects of agri-food production. Despite the increasing diversification of the rural economy in Bosnia and Herzegovina (BA) and in Montenegro (ME), agriculture generally occupies an important place in the economic structure. Agricultural production in both countries is dominated by plant production. The objective of the study was a needs assessment and mapping of knowledge transfer potential with identification of existing forms and channels of knowledge transfer in agricultural sector, gaps and challenges. The study analyzed these gaps, and suggested potential means and solutions to boost these relations. Data was gathered by conducting interviews and surveys: among HEIs involved in the project (online interviews with persons in charge of WP1) and among farmers and extension service provider (agricultural advisors) in all countries participating in the project, with exception of Serbia where only farmers were surveyed. The conclusion showed that there is a space for the improvement in ICT knowledge transfer from R&D and educational and both parties are well aware of barriers which are mainly rooted in the lack of knowledge and lack of competent educators.

Key words*: knowledge transfer, digital competencies in agriculture, farmers, agricultural advisors.*

ADVANCES IN BLUE RESIDUAL MATERIALS FOR PRODUCTION OF BIOSTIMULANTS AND FERTILIZERS

Violeta Alexandra ION[1], Oana Cristina PARVULESCU[2], Liliana BĂDULESCU[1], Cristian RADUCANU[2], Anne-Kristin LØES[3], Joshua CABELL[3], Athanasios SALIFOGLOU[4], Carlos LETELIER GORDO[5], Max NIELSEN[6], Sigbjorn LANDAZURI TVETERAS[7], Ursula LANDAZURI TVETERAAS[7], Marios MAROULIS[4], Sevasti MATSIA[4], Rasmus NIELSEN[6]

[1]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania
[2]Chemical and Biochemical Engineering Department, University Politehnica of Bucharest, 1-6 Gheorghe Polizu, 011061, Bucharest, Romania
[3]Norwegian Centre for Organic Agriculture, Gunnars veg 6, NO-6630 Tingvoll, Norway
[4]Chemical Engineering Department, University of Thessaloniki (AUTh), Corner of September 3rd and Egnatia St., 462, 54124, Thessaloniki, Greece
[5]Technical University of Denmark (DTU), Willemoesvej 2, 9850 Hirtshals, Denmark
[6]University of Copenhagen, Rolighedsvej 25, 1958, Frederiksberg C., Denmark
[7]Norwegian Research Centre, Nygårdsgaten 112, 5008 Bergen, Norway

Corresponding author email: oana.parvulescu@yahoo.com

Abstract

Industrial processing of fish, shellfish, and seaweed results in large amounts of blue residual materials (BRMs), which can be converted into value-added products such as food, feed, fuels, biostimulants, and fertilizers. Biostimulants and fertilizers produced from BRMs promote recycling of nutrients from the sea back to the terrestrial environment, according to EU's circular economy policy. BRMs can be processed in different ways to obtain biostimulants and fertilizers, e.g., extraction, chemical/biochemical hydrolysis, composting, anaerobic digestion. Biostimulants and fertilizers are supplied in liquid or solid form and can be applied to plant roots or as a foliar spray. Studies in the related literature have reported positive effects of BRM-based biostimulants and fertilizers on plant growth and productivity. Moreover, biostimulants can help plants to cope with stressful environmental conditions, e.g., drought, cold, abiotic stress.

Key words*: biostimulant; fertilizer; fish waste; shellfish waste; seaweed waste; nutrient recycling.*

PYROLYSIS OF GRAPE MARC WASTE FOR PRODUCING BIOCHAR

Violeta Alexandra ION, Andrei MOȚ

Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: suzanastancescu@yahoo.com

Abstract

Pyrolysis consists in thermal decomposition of an organic feedstock in an oxygen limited environment resulting in biochar and volatiles. Biochar is widely used for soil amendment to improve soil properties and for soil carbon sequestration. The aim of this study was to obtain biochar by fixed bed pyrolysis of grape marc, in the presence of CO2 as a carrier gas. Heat flux, carbon dioxide superficial velocity and material particle size were selected as process factors. The obtained biochar was characterized in terms of dry matter, loss on ignition, SEM imaging, total carbon and nitrogen content, bulk density, water holding capacity (WHC), pH, electrical conductivity (EC), and mineral content. Biochar obtained from grape marc had high levels of dry matter, fixed carbon and EC. The average carbon content was 69.07% dry mass. Biochar also has a high content of N (2.58%), P (7834.83 mg/kg) and K (60769.43 mg/kg), which can make it suitable to be used as soil amendment.

Key words*: biochar, grape marc, pyrolysis, physicochemical characterisation.*

INFLUENCE OF THE TYPE OF THE SPRAYING ON SOME TECHNOLOGICAL AND ECONOMIC INDICATORS IN PESTICIDE TREATMENT OF VINEYARDS

Dimitar KEHAYOV, Ivan ZAHARIEV, Petya GENKOVA

Agricultural University - Plovdiv, Department
of Mechanization of Agriculture, 12 Mendeleev Blvd, Plovdiv, Bulgaria

Corresponding author email: dkechajov@au-plovdiv.bg

Abstract

The aim of the present study is to compare some technological and economic parameters in the treatment of vines with pesticides using: axial and tangential fan sprayers. The following indicators are the degree of coverage of the leaf mass, the degree of penetration of the pesticide into the canopy of the vines and the price of the sprayers. From the experiments, calculations and analyzes conducted so far, it can be concluded that both sprayers meet to a very good extent the technological requirements after mandatory treatment of each vine row on both sides. The degree of coverage of the leaf mass with drops is about 65% for axial and about 78% for tangential sprayers. The difference is due to the more concentrated and directed jet (from air and solution) in the tangential sprayer. This allows for good mixing and passing through the leaf mass. Regarding the other technological indicator - penetration rate - the results are approximately the same. Given the small difference in prices, this is a reason to recommend working with a tangential sprayer when treating vineyards with pesticides.

Key words*: axial and tangential fan sprayers, degree of coverage, degree of penetration.*

WHAT COLOUR SUITS YOU BEST? A GENERAL OVERVIEW OF METHODS FOR FUNGAL ORGANISMS STAINING AS POST-VITAL MICROSCOPICAL PREPARATIONS USED IN PLANT PROTECTION

Daniel Kazimir KURZELUK

Research-Development Institute for Plant Protection, 8 Ion Ionescu dela Brad Blvd, District 1, Bucharest, Romania

Corresponding author email: kurzelukdaniel@yahoo.com

Abstract

Staining fungi or anatomical parts of them (spores, conidiae, conidiophores, mycelia etc.) is still one of the most used study method in phyto- or zoo- or anatomopathology. In order to fix, dehydrate and clarify them, lactophenol remains the best reagent. Even if various modern techniques are used today, some of the nowadays neglected „classical ones" can sometimes provide an alternate investigation method which can led to interesting morphological and systematic data, or, at least reveal in more specific ways microscopical structural details.

Key words: *Fungi staining, dyes, spore staining, mycelia staining.*

COMPARATIVE LEAF AND FLOWER MORPHO-ANATOMICAL STUDY OF WILD AND CULTIVATED GOJIBERRY (*LYCIUM BARBARUM* L.) IN ROMANIA

Vasilica LUCHIAN[1], Roxana CICEOI[2], Minodora GUTUE[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: roxana.ciceoi@qlab.usamv.ro

Abstract

Goji berry (Lycium barbarum L.) is widely used as food and medicine in Asian countries and recently had a dramatic gain in popularity on American and European continents. Due to their complex composition and recommendations in traditional Chinese Medicine, goji berry is also one of the most studied species in the recent years. The species grow wild in Romania, being appreciated for its bush density for hedges and fences. Initially, imported L. barbarum varieties were used by goji berry growers for commercial plantations, while in the last year five new varieties were homologated. The morpho-anatomical structure of leaves and flowers of the wild and cultivated goji berry from the Bucharest area was compared, to determine important traits that could be relevant for goji breeders but also for taxonomists. Morphological differences were found regarding the leaves shape, position, and leaves width. The wild L. barbarum has cuticle-covered leaves, highly developed vascular bundles and vascular bundle sheaths were present in the mesophyll. The palisade cells appeared to be very large. These characteristics of the leaf's anatomy are also relevant in the context of biotic stressors, as eriophyid mites, that are one of the most important pests of goji berry shrubs.

Keywords: wild and cultivated *Lycium barbarum, leaf anatomy, mesophyll, vascular bundle.*

RHIZOSPHERE EFFECT OF HORTICULTURAL PLANTS LETTUCE (*LACTUCA SATIVA* L.) AND TOMATO (*SOLANUM LYCOPERSICUM* L.) ON *NEMATOPHAGOUS* SPECIES FROM FUNGAL COENOSES

Gabi-Mirela MATEI[1], Sorin MATEI[1], Elena Maria DRĂGHICI[2]

[1]National Research-Development Institute for Soil Science, Agrochemistry and Environment Bucharest, 61 Marasti Blvd, District 1, Bucharest, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, Romania, 59 Marasti Blvd, District 1, Bucharest, Romania

Corresponding author email: so_matei602003@yahoo.com

Abstract

The presence of nematophagous fungi in microbial communities from horticultural plants grown in greenhouses is considered beneficial because they are possible biological control agents of plant-parasitic nematodes. Previous studies performed to elucidate the rhizosphere effect on nematode-trapping fungi are scarce and therefore is important to investigate the ecology of nematophagous fungi in the rhizosphere of different plants. The aim of this paper is to present the results of research carried out in greenhouse conditions to compare the rhizosphere effect of two horticultural plants, represented by lettuce (Lactuca sativa L.*) and tomato (Solanum lycopersicum* L.*) on naturally occurring nematophagous fungi with special focus on nematode-trapping fungi and endoparasitic fungi, as well as ecological aspects in fungal community structure and functions. Nematophagous fungi from lettuce rhizosphere belong to nematode-trapping species (Arthrobotrys oligospora, Dactylaria candida, Monacrosporium cionopagum) and endoparasitic species (Harposporium anquillulae,). Excepting Dactylaria candida, the same nematophagous species were identified in the rhizosphere of tomato plants. In both plant rhizospheres, different adhesive or non-adhesive hyphal structures to capture nematodes and non-adhesive infection conidia detected were photographed and presented.*

Key words*: nematode-trapping fungi, rhizosphere effect, microbial communities, endoparasitic fungi, biological control agents.*

ENVIRONMENTAL CONCERNS REGARDING THE OCCURRENCE OF NEONICOTINOID INSECTICIDES IN BERRY FRUITS

Mária MÖRTL, Szandra KLÁTYIK, András SZÉKÁCS

Agro-Environmental Research Centre, Institute of Environmental Sciences, Hungarian University of Agricultural and Life Sciences, Herman Ottó út 15, H-1022, Budapest, Hungary

Corresponding author email: roxana.ciceoi@qlab.usamv.ro

Abstract

Nowadays goji berry (Lycium barbarum), or wolfberry (Lycium chinense) became popular due to their proposed health benefits. Conventionally grown goji berries are often treated extensively with pesticides that led to the high levels of pesticide residues in the imported products in the USA and in Europe. Among the insecticides, neonicotinoid type ingredients were frequently found in some wolfberry products of Chinese origin, which occasionally exceeded the corresponding maximum residue limit (MRL) values. In addition to imidacloprid and thiamethoxam, more old ingredients (e.g. carbofuran) were also detected, that are banned in the European Union (EU). Their negative effects, particularly for bees, led to the ban of 3 neonicotinoids, whereas acetamiprid is still in use in Europe. Strict regulation in EU resulted in legal violations related to the pesticide residues in the imported goji berry products, that led to increase the level of official controls on imports of certain feed and food (2018/941) in the EU, including goji berry as well. However, the corresponding MRL (EC 396/2005) e.g. for acetamiprid has been increased.

Key words*: neonicotinoid insecticides, ban, goji berry, Lycium sp.*

TECHNOLOGY DESIGN FOR *SIDERITIS SCARDICA* AS A NEW CULTURE IN ROMANIA

Geanina NEGOȘANU[1], Adrian ASĂNICĂ[2], Costel VÎNĂTORU[1], Adrian PETICILĂ[2], Bianca MUȘAT[1], Camelia BRATU[1], Matilda POPESCU[1]

[1]Plant Genetic Resources Bank - for Vegetables, Floricultural, Aromatic and Medicinal Plants, 56 Nicolae Balcescu Blvd, Buzău, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: geanina.neacsu11@gmail.com

Abstract

The current ascending international trends to enclose in production and food sector the aromatic and medicinal plants is similar in Romania too. Due to a steadily loss of biodiversity, many endemic species, especially in the areas of origin, are endangered, among them being the species Sideritis scardica. In Romania, after 1996 it was the subject of acclimatization and breeding research. At the same time, in order to popularize and expand the species in culture, the focus of the research was directed towards the elaboration of the specific growing technology in accordance with the pedo-climatic conditions of our country. This work summarizes the research undertaken at PGRB Buzau in the period 2019-2021 on the optimal culture technology at Sideritis scardica highlighting the fact that the best results were obtained at the establishment of the culture by seedling, obtained on the experimental variant represented by 80% peat and 20% dolomite (limestone). The optimal scheme for planting in the field was of 70 cm between rows and 50 cm between plants/row and the maximum biomass production was obtained in the 3rd year of cultivation, respectively 179 kg green mass/100sqm. Studies have shown that Sideritis scardica can be successfully cultivated in Romania with a real potential for valorization: medicinal, aromatic honey, ornamental and last but not least for the revaluation of arid hollows in mountainous areas.

Key words*: genotype, breeding, acclimatization, Mursalski, seedling.*

TECHNIQUES TO INCREASE THE STORAGE CAPACITY OF SYNTHETIC SEEDS OF *SOLANUM TUBEROSUM*

Ioana-Cătălina NICOLAE[1, 2], Oana VENAT[1, 2], Adrian PETICILA[2], Dorel HOZA[2]

[1]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, Faculty of Horticulture, 59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: oana.venat@qlab.usamv.ro

Abstract

Nowadays, in the context of habitat destruction, climate changes and the disappearance of species, the conservation of plant genetic resources becomes essential. Solanum tuberosum is one of the most economically important species in terms of food consumption. Because the species is susceptible to various systemic pathogens, in vitro techniques are preferred for storing the germplasm. In addition, storing tubers is time consuming and needs to be done annually and seed storage is not possible, as this species is highly heterozygous. Synthetic seed technique can be a useful tool in plant conservation, as it combines the advantages of vegetative and generative propagation. Using synthetic seed technology, nodal segments and shoot tips obtained from in vitro cultures were encapsulated in sodium alginate solutions containing different concentrations of salicylic acid (0; 25 µM and 50 µM). After 6 months of storage at 4°C and under dark conditions, synthetic seeds were inoculated on regeneration medium with 0.3 IAA and different concentrations of BAP (2 mg/L, 3 mg/L and 4 mg/L).

Key words*: biodiversity conservation, in vitro conservation, salicylic acid, Solanum tuberosum, synthetic seed.*

DIFFERENT HORMONES ON *IN VITRO* PROPAGATION OF GISELA 5 CHERRY ROOTSTOCK

Ioana-Cătălina NICOLAE[1, 2], Oana VENAT[1, 2], Adrian PETICILA[2], Dorel HOZA[2]

[1]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, Faculty of Horticulture, 59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: oana.venat@qlab.usamv.ro

Abstract

Gisela 5 is one of the most important dwarfing cherry rootstock for cherry (Prunus avium) in Central Europe, recommended in very high density plantations. It was obtained by crossing Prunus cerasus 'Schattenmorelle' x Prunus canescens and it is known for its high precocity, dwarfing and productivity. Gisella 5 is propagated clonally, using greenwood, soft or hardwood cuttings. In vitro cultures were established using vegetative shoots of Gisela 5, and after sterilization and inoculation of explants, multiplication mediums containing various concentrations of macroelements and phytohormones as BAP and GA3 were tested. Rooting capacity of the explants was observed on mediums with different salt concentrations and auxins as IBA, IAA and NAA.

Key words*: auxines, gisela 5, in vitro, micropropagation, rooting, rootstock.*

THE ALLUVIAL FOREST VEGETATION DISTURBED BY THE INVASIVE ALIEN PLANTS, IN THE DANUBE VALLEY, BETWEEN CETATE AND CALAFAT

Mariana NICULESCU

University of Craiova, Faculty of Horticulture, Doctoral School of Plant and Animal Resources Engineering, 13 A.I. Cuza Street, 200585, Craiova, Romania

Corresponding author email: mniculescum@yahoo.com

Abstract

Invasive species have a negative impact on forest, grassland, and agricultural ecosystems around the world, sometimes associating and forming segetal or ruderal plant communities. Exotic species compete with native species and threaten ecosystem stability. The studies on alien species are of particular interest today to protect natural habitats and reduce or eliminate ecological and economic damage. Invasive species are one of the most serious threats to biodiversity. The paper presents the results of the investigations carried out in the alluvial forest vegetation in the Danube Valley from Oltenia, between Cetate and Calafat. In this region, the intensive abiotic activity, but not only that, has brought about the invasion of allochtone (invasive alien) species plants in the natural and semi-natural degraded ecosystems, especially in alluvial forest habitats. The species has been found in the following types of natural habitats: 91E0 - Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae), CLAS. PAL.: 44.3, 44.2 şi 44.13; 92A0 - Salix alba and Populus alba galleries, CLAS. PAL.: 44.141, 44.162 şi 44.6; 91F0 - Riparian mixed forests of Quercus robur, Ulmus laevis and Ulmus minor, Fraxinus excelsior or Fraxinus angustifolia along the great rivers (Ulmenion minoris), CLAS. PAL.: 44.4; 91I0* - Euro-Siberian steppic woods with Quercus spp.*

Key words*: alluvial forest, alien species, Danube valley.*

POTASSIUM AND MAGNESIUM CONTENT IN MANDARIN ON MARKET OF CITY OF ZAGREB

Marko PETEK[1], Morana REHAK[1], Tomislav KARAŽIJA[1], Antonio VIDUKA[1], Mile MARKOSKI[2], Szilvia VERES[3] Goran FRUK[1]

[1]University of Zagreb, Faculty of Agriculture, Svetošimunska cesta 25, Zagreb, Croatia
[2]Faculty of Agricultural Sciences and Food, 16th Macedonian Brigade No.3, Skopje, North Macedonia
[3]University of Debrecen, Egyetem tér 1, Debrecen, Hungary

Corresponding author email: tkarazija @agr.hr

Abstract

Mandarin is a plant species which belongs to the group of winter seasonal fruit. It is highly valued for its vitamin C, potassium and magnesium content. When buying mandarins, consumers do not have the information on the exact mineral composition of mandarins so a study was conducted to determine the content of macroelements potassium and magnesium in mandarins as well as to compare the results with regards to the place of purchase of individual samples. Mandarin sampling was carried out in the city of Zagreb at 3 markets, 3 retail chains and 3 organic product stores. After digestion with concentrated HNO3 and HClO4 in microwave oven, potassium was determined by flame photometry and magnesium by atomic absorption spectrometry. Dry matter was determined gravimetrically by drying until constant mass. The content of dry weight in the mandarin samples ranged from 7,86 % to 8,70 %. The content of potassium in dry weight of mandarin ranged from 2,04 % to 2,33 %, and the content of magnesium from 0,101 % to 0,110 %. The content of potassium in the fresh weight of mandarin ranged from 235 to 297 mg K/100 g fresh weight, and the content of magnesium ranged from 11,6 to 14,0 mg Mg/100 g fresh weight.

***Key words**: fruit, macroelements, minerals, nutritional value.*

CHARACTERISTICS OF SOILS FROM THE AREA OF XANTHI - NORTHERN GREECE FOR GROWING VINEYARDS AND KIWI

Rada POPOVA, Dimitar KEHAYOV

Agricultural University - Plovdiv, Department of Soil Science and Agrochemistry, 12 Mendeleev Blvd, Plovdiv, Bulgaria

Corresponding author email: radapopova@abv.bg

Abstract

Due to the hot subtropical climate, agriculture in Greece specializes in growing various heat-loving crops - rice, cotton, olives / third in the world after Spain and Italy /, citrus fruits, sesame, vines /, special varieties of raisins and more. The aim of the present work is to determine to what extent the soils in the Xanthi region are suitable for growing kiwis and vineyards. Some soil indicators were determined such as particle size composition with FRITISH photosedimentograph, pH, humus content, total and active carbonates and digestible forms of N, P and K. It was found that the soils in the study area were developed on carbonate clays. In terms of particle size composition and their physico-chemical and agro-chemical properties, these soils prove to be suitable for growing kiwis and vines.

Key words*: soil properties, vineyards, Xanthi.*

MINERAL NUTRITIONAL VALUE OF PRODUCTS CONTAINING ARONIA FRUITS AND JUICES: A REVIEW

Laura POP[1], Rui COSTA[2, 3], Adrian ASĂNICĂ[1], Liliana TUDOREANU[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Marasti Blvd, District 1, Bucharest, Romania
[2]Polytechnic Institute of Coimbra, Coimbra Agriculture School, Bencanta, 3045-601 Coimbra, Portugal
[3]Research Centre for Natural Resources, Environment and Society (CERNAS), Coimbra Agriculture School, Bencanta, 3045-601 Coimbra, Portugal

Corresponding author email: laurapop_22@yahoo.com

Abstract

The "superberry" Aronia melanocarpa has attracted a lot of attention due to its high content of phenolic phyto-chemicals. However, little attention has been paid to its mineral content. The main objective of this paper is to review the mineral content of black chokeberry fruits, products and by-products, focusing on the health importance of mineral intake from food, against supplements. A lot of food databases and scientific publications demonstrated that comparing to fresh apples, fresh black chokeberry fruits contain high concentrations of minerals such as potassium (290.3 mg/100 g) - which contributes to human health by regulating protein synthesis and the metabolization of carbohydrates - and copper (0.211 mg/100 g), zinc (0.147 mg/100g), selenium (0.028 mg/100 g) - which act as antioxidants. The fresh Aronia melanocarpa berries also contain manganese, which is an essential micronutrient for plant growth and development. Nevertheless, excessive manganese accumulation in human's body may lead to adverse effects like insomnia, memory loss, irreversible nerve damage. Few results have been found for manganese concentrations in black chokeberries (0.0829 mg/100 g dry weight) and in aronia juices (reported to vary between 0.298 ± 0.003 mg/100 g and 1.177 ± 0.005 mg/100 g). Therefore, extensive research conducted in this area is needed in order to identify and quantify the mineral concentrations of aronia fresh berries and products and to contribute to an advance knowledge of mineral content as a key role for healthy natural products. Additionally, the variability of the mineral's concentrations in the aronia fruits should be taken into consideration, as they are in direct relation with crop variety, soil characteristics, climate changes, fertilization and harvesting time.

Key words*: Aronia, juice, minerals, micronutrients, macronutrients.*

IN VITRO RESEARCH STUDY ON THE ANTIMICROBIAL ACTIVITY OF SEA BUCKTHORN, BLACK CUMIN AND GRAPE SEED ESSENTIAL OILS AGAINST SELECTED FOOD SPOILAGE FUNGI

Paul-Alexandru POPESCU[1], Vlad Ioan POPA[2], Mihai FRÎNCU[2], Amalia Carmen MITELUȚ[1], Elisabeta Elena POPA[1], Mona Elena POPA[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]Research Centre for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: elena.eli.tanase@gmail.com

Abstract

Natural antimicrobial agents such as essential oils obtained from plants can control the growth of different food spoilage microorganisms, thus prolonging the shelf-life and quality of food products. As essential oils are not toxic and already used as flavoring agents, they can be used as substituents for chemical preservatives used to control microbial growth. This study aimed to evaluate the antimicrobial activity by determining the minimum inhibitory concentrations (MIC) of sea buckthorn, black cumin, and grape seed essential oils over four different mould strains usually occurring in the spoilage of fruit products. The fungi used in the experimental research were Penicillium expansum, Fusarium oxysporum, Botrytis cinerea, and Aspergillus flavus. To establish the minimum inhibitory concentration of the essential oils, the agar disc diffusion technique was used. The results showed that all essential oils inhibited the growth of Penicillium expansum and Aspergillus flavus strains at a minimum volume of essential oil of 30 µL.

Key words*: antimicrobial activity, essential oils, fungi, food spoilage.*

MINIMALLY PROCESSING AND PRESERVATION METHODS FOR SHELF-LIFE PROLONGING OF DIFFERENT TYPES OF FRUITS

Paul Alexandru POPESCU[1], Ioana-Cătălina NICOLAE[2], Amalia Carmen MITELUȚ[1], Elisabeta Elena POPA[1], Mihaela Cristina DRĂGHICI[1], Valerica Luminița VIȘAN[1], Mona Elena POPA[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]Research Centre for Studies of Food and Agricultural Products Quality, University of Agronomic Sciences and Veterinary Medicine, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: catalina.nicolae@qlab.usamv.ro

Abstract

Minimally processed fruits are characterized by a short storage period, due to their high sensitivity to microbial and physico-chemical alteration due to the increased respiration rate and more ethylene production, which stimulates the overripening and the injury of the fruit tissue. Moreover, microbial alteration may present a food safety risk for the end consumers, fruits mostly being consumed in raw state. In addition, consumers have become more critical regarding the use of synthetic food additives utilized to increase the shelf life or to improve some sensorial characteristics of the fruits. Controlled temperature and hygiene of the whole supply chain offers the necessary conditions to maintain the quality of the products and to stop the alteration and cross contamination with pathogenic microorganisms. Because fresh fruits shelf life very much depends on certain temperatures and relative humidity parameters, to avoid spoilage, they must be handled properly during all the stages prior to their commercial points. The storage time of the majority of fruits is determined by changes in their sensorial characteristics and, therefore, in order to extend the shelf life and maintaining good quality, farmers and processors must keep the them at the optimum storage conditions that could be specific to each specie and variety.

***Key words**: fruits, preservation, quality, shelf-life.*

EFFICIENT RECYCLING OF FRUIT TREE WASTES THROUGH CONTROLLED CULTIVATION OF EDIBLE MUSHROOMS

Marian PETRE[1], Răzvan Ionuț TEODORESCU[2], Ionela RUSEA[1], Gabriela ȚEȚU[1]

[1]University of Pitesti, 1 Târgul din Vale Street, 110040, Pitesti, Arges County, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: marian_petre_ro@yahoo.com

Abstract

The aim of this work was to establish the best biotechnology for efficient recycling of fruit tree wastes by using them as growing sources for mushroom species. In vitro experiments were carried out in controlled conditions for the optimal cultivation of Pleurotus ostreatus and P. eryngii to get their carpophores as food and medicinal biomass. There were set up three variants of substrates consisting of lignocellulosic wastes belonging to apricot, pear and walnut trees. After inoculation with pure cultures of mentioned species, the substrates were placed into growth chambers at constant temperature of 23°C, during the incubation between 15-30 days. The physical and chemical parameters during the period of carpophore formation and development were set up and maintained at optimal levels, depending on each mushroom species. After a period of 30 up to 45 days, the registered results revealed a faster development of carpophores and a better productivity of P. ostreatus in comparison with P. eryngii, but the controlled cultivation of both mushroom species turned out to be an efficient recycling biotechnology to get value-added products.

Key words*: carpophores, in vitro cultivation, lignocellulose wastes, Pleurotus eryngii, Pleurotus ostreatus.*

INVASIVE NATIVE PLANTS IN ANTHROPOGENIC ECOSYSTEMS FROM OLTENIA, ROMANIA

Daniel RĂDUȚOIU, Dragoș Mihail ȘTEFĂNESCU

University of Craiova, Faculty of Horticulture, 13 A.I. Cuza Street, Craiova, Romania

Corresponding author email: radutoiu02daniel@gmail.com

Abstract

Oltenia is located in the southwestern part of Romania, between the Danube, the Olt and the Southern Carpathians. The anthropogenic ecosystems in this part of the country are represented by those areas where human intervention is partial or total. These are confined from the plain to the Sub-Carpathian depressions. In Oltenia, there are to be found anthropogenic ecosystems comprising orchards, vineyards, protected crops (vegetables and flowers), as well as those of human settlements (rural and urban). Some spontaneous species found in these ecosystems are native plants that have shown an increased invasive potential in recent years. The analysis of data collected from the field shows an affinity of some species for certain anthropogenic ecosystems (ex. Calamagrostis epigeios (L.) Roth, Daucus carota L., Elymus repens (L.) Gould - for the orchards; Stellaria media (L.) Vill., Lamium purpureum L., Veronica hederifolia L., V. polita Fr., Senecio vernalis Waldst. et Kit. - for the viticultural ecosystems; Digitaria sanguinalis (L.) Scop., Cirsium arvense (L.) Scop., Sinapis arvensis L., Portulaca oleracea L. – for vegetable crop areas); Cardaria draba (L.) Desv., Capsella bursa pastoris (L.) Medik., Hordeum murinum L., Onopordum acanthium L. - for the human ecosystems. On the other hand, there are certain species found in almost all types of anthropogenic ecosystems: ex. Cynodon dactylon (L.) Pers., Convolvulus arvensis L.

Key words*: crops, invasive, native plants, Oltenia, Romania.*

VEGETATION DAMAGE TO AGRICULTURAL CROPS IN OLTENIA, ROMANIA

Daniel RĂDUȚOIU, Ion STAN

University of Craiova, Faculty of Horticulture, 13 A.I. Cuza Street, Craiova, Romania

Corresponding author email: radutoiu02daniel@gmail.com

Abstract

The agricultural crops within Oltenia occupy significant areas, especially at the level of the Oltenia Plain and of the Piedmont Hills. The rest of the areas where agricultural crops are located account for less extensive surfaces (at the top of the Getic Piedmont and of the Sub-Carpathian hills). In recent years, much of the agricultural land in this part of the country has been cultivated with precision agriculture, but in some areas conventional agriculture is still maintained. The comparative analysis of the lands where conventional versus precision agriculture is practiced highlights the existence of a different spontaneous vegetation, which on certain surfaces is harmful to agricultural crops. If we add to these the increasing recent expansion of invasive alien species, we can say that the production of these surfaces is significantly affected. Vegetation harmful to agricultural crops in Oltenia is included in 12 associations. The phytocenoses of the association Stellarietum mediae Hadac 1969 have the largest distribution, but the phytocenoses of the association Setario-Sorghetum halepensis Ștefan and Oprea, 1997 cause significant damage.

Key words*: agricultural crops, Oltenia, Romania, vegetation.*

URBAN HOMEGARDENS FOR TIMES OF CRISIS IN BOGOTA, COLOMBIA

Laura ROJAS[1], Vladimir VERNER[1], Patrick VAN DAMME[2]

[1]Czech University of Life Sciences Prague, Prague, Czech Republic
[2]Ghent University, Belgium

Corresponding author email: rojas_pardo@ftz.czu.cz

Abstract

A red piece of fabric in the facade of houses symbolized a call for help for some Bogota inhabitants during the COVID 19 pandemic in the face of the lockdown and not being able to supply their basic needs. We visited 12 of such affected households with the aim to characterize! all useful tolerated and actively cultivated plant species diversity in their home-gardens and analyses its contribution to gardeners. A total of 75 plant species (12% native and 88% exotic) were recorded through walk-in-the-woods approach in combination with semi-structured interviews where respondents were encouraged to show all useful plants in their gardens. Most of the species documented (59%) had only one function. Most common plant uses were food (65.3%) and medicine (52%). Additionally, all gardeners perceived their homegrown food as fresh and healthy and manifested their home-gardens helped them feel relaxed and conserve their environment. All respondents considered homegardening benefited their families in difficult times. These findings show urban home-gardens host agrobiodiversity fundamental to support steady fresh food supply in times of crisis and overall improve livelihoods.

Key words*: plant diversity, urban agriculture, welfare.*

PECULIARITIES OF THE LINDEN LEAF AREA IN RELATION TO THE LEAF POSITION ON THE SHOOT

Simona ROŞU, Mihai Valentin HERBEI, Florin SALA

Banat University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara, 119 Aradului Str., Timisoara, Romania

Corresponding author email: florin_sala@usab-tm.ro

Abstract

The study evaluated the linden leaf area (LA), and found models to describe the leaf area variation in relation to the leaf position on the shoot (Lp) and shoot parameters (CSL, cumulative shoot length). Leaves were studied on annual growth shoots, from the Cenad Forest Protected Area, Timis County, Romania. Leaf area (LA) was determined by scanning (SLA) and calculation based on leaf parameters (L, w) and correction factor (Cf = 0.31, optimal value found), based on relation of type MLA = L × w × Cf. The fit level between MLA and SLA (as reference) was described by a linear equation, and confirmed by R^2 = 0.985 and RMSEP = 4.97363. The variation of SLA and CSLA (cumulative scan leaf area) in relation to the position of the leaf on the shoot (Lp) and cumulative shoots length (CSL) was evaluated by regression analysis and described by equations, 3D models and in the form of isoquants, under conditions of statistical safety (R^2 = 0.960, R^2 = 0.999, p <0.001). Some leaves have been found as deviations of SLA from the theoretical model and can be considered as foliar indicators (FI) for growth conditions during the shoot vegetation period.

Key words: *annual shoot; correction factor; foliar indicators; leaf area; linden; model.*

MORPHO-ANATOMICAL CONSIDERATIONS ON THE SPECIES *LIMONIUM TOMENTELLUM* (BOISS.) O. KUNTZE FROM ROMÂNIA

Cătălin George SIMEANU, Daniel RĂDUŢOIU

University of Craiova, Faculty of Horticulture, 13 A.I. Cuza Street, Craiova, Romania

Corresponding author email: radutoiudaniel@yahoo.com

Abstract

Morphological and anatomical studies are of great importance to species of the genus Limonium, because they are essential for their correct differentiation. Limonium tomentellum (Boiss.) O. Kuntze. represents a plant of great sozological importance for Romania and it is mentioned in humid, halophilous meadows. A few specialized works include floristic and vegetation studies that mention this species, but data on the morphology and especially on the anatomy of the vegetative organs of this taxon are rare or absent.
The analysed vegetal material originated in the classic sampling location given for this species in Romania (Bratovoieşti - Dolj County). The specimens were collected in full bloom.
The roots of the specimens under study are taproots, vary in length, being comprised between 70 and 120 cm, and they have a secondary structure. At the level of the central cylinder, the stem has sclerenchyma, where the vascular bundles are located, being placed on three concentric circles. This tissue replaces the fundamental parenchyma. The leaves display an isolateral structure, their petiole having a semi-cylindrical shape, with a strongly convex lower part and a slightly concave upper part that extends on the two edges with a triangular formation with pointed end. It has six large steles towards the abaxial face and ten smaller steles towards the adaxial face, while each of the two extensions of the petiole contains two small steles that are placed one below the other; therefore, it is a polystelic petiole.

Key words*: characters, Limonium tomentellum, morpho-anatomy, Romania.*

THE USE OF RASPBERRY PI IN EDUCATION FOR THE APPLICATION IN SMART AGRICULTURE

Alma SECERBEGOVIC, Amera SINANOVIC, Muris MASIC and Aljo MUJCIC

University of Tuzla, Franjevacka 2, Tuzla, Bosnia-Herzegovina

Corresponding author email: alma.secerbegovic@fet.ba

Abstract

The global agriculture production has to increase at least half of its current level to meet the increased food demand in 2050. One of the possible solutions for this problem is the usage of innovative agricultural techniques. Applying the Internet of things (IoT) in agriculture allows for real-time insight on crops and livestock, and prevents illness among animals and keeps crops growing efficiently. While the smart agriculture industry is growing, it is also necessary to involve students to learn to design and create different IoT solutions. In this work, several use cases are presented where Raspberry Pi 4 is used as a microcontroller for smart agriculture scenarios. Various parameters are measured including temperature, moisture, light intensity and displayed in real-time on smartphone and computers. The educational aspect shows that students can contribute to this fast growing field of smart agriculture and design solutions that have tremendous impact on the farmer's work.

Key words*: Raspberry Pi, Internet of Things (IoT), soil moisture, automated irrigation.*

PRELIMINARY SURVEY FOR MAPPING THE DISTRIBUTION OF SPONTANEOUS GOJI BERRY SHRUBS IN ROMANIA

Mala-Maria STAVRESCU-BEDIVAN[1], Cristina Florentina PELCARU[2, 3], Cătălin Mihai CROITORU[2], Clara Daniela MIHAI[3], Roxana CICEOI[4]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, Faculty of Agriculture, 59 Mărăşti Blvd, District 1, Bucharest, Romania
[2]Comana Natural Park Administration, 608 Gellu Naum Str., Comana, Giurgiu County, Romania
[3]University of Bucharest, Faculty of Biology, 91-95 Splaiul Independenței, Bucharest, Romania
[4]Research Center for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59, Mărăști Blvd, Bucharest, Romania

Corresponding author email: cristina.pelcaru@drd.unibuc.ro

Abstract

So far in Romania, based on literature, online resources, and personal reports, the solanaceous shrubs of Lycium barbarum L. (syn. L. halimifolium Mill.) were recorded in Bucharest and 37 counties, from a total of 41. During the field trips between July 2021 and February 2022, made by the authors and researchers in the frame of the ProtectGoji citizen science-based project, new data about the locations where the wild goji berry bushes are encountered were gathered and some of these records have already been introduced and validated in the iNaturalist database. The present study records of spontaneous goji berry plants included Bucharest and 18 counties, as follows: Arad, Brăila, Braşov, Buzău, Caraş-Severin, Călăraşi, Cluj, Constanța, Galați, Giurgiu, Ialomița, Iași, Ilfov, Prahova, Olt, Teleorman, Tulcea and Vrancea. Of these, Bucharest and 14 counties (Arad, Braşov, Buzău, Caraş-Severin, Călăraşi, Cluj, Constanța, Galați, Giurgiu, Iași, Ilfov, Olt, Tulcea and Vrancea) were previously mentioned in the dedicated literature or online databases, whilst Ialomița, Brăila, Prahova and Teleorman represent new occurrences for wild goji distribution. To the best of author's knowledge, there are still no records or published data concerning distribution of wild Lycium shrubs in Covasna, Dâmbovița, Hunedoara and Sălaj, although some goji plantations have been reported in some of these counties. The aim of this survey was to design a preliminary map of distribution for wild Lycium spp. in Romania, considering the increasing importance in terms of ornamental, nutritional and therapeutic value, but also for plant protection reasons, to prevent the spread of new alien species in the commercial fields via the reservoirs of wild goji berry plants.

Key words*: Lycium sp., citizen science, distribution map, spontaneous, Romania.*

NUTRITIONAL CHARACTERIZATION OF ORGANIC SEA BUCKTHORN POMACE

Ioana STANCIU, Ruxandra DIMA, Elisabeta Elena POPA, Mona Elena POPA

University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: elena.eli.tanase@gmail.com

Abstract

Sea buckthorn is recognized worldwide as a valuable berry with real benefits in human health. It is being analysed in detail for its introduction as a functional ingredient in various sectors of the food industry. The most popular industrial product of sea buckthorn fruit is sea buckthorn juice, but significant amount of pomace results after fruit processing as waste. The purpose of this paper is to characterize fresh, dried, and ground sea buckthorn pomace (as powder) that could be further used as functional ingredients. In terms of nutritional characterization, antioxidant activity, total phenolic content and ascorbic acid content were determined. The results show that sea buckthorn pomace presents important nutritional value and can be further processed and used as a functional ingredient in various industrial applications.

Key words*: sea buckthorn, functional ingredient, pomace, sea buckthorn powder.*

SOIL AS A SUITABILITY FACTOR FOR APPLE GROWING ON THE AREA OF GRADISKA CITY

Milan SIPKA[1], Mihajlo MARKOVIC[1], Boris MARKOVIC[2], Mladen BABIC[1]

[1]University of Banjaluka, Faculty of Agriculture, Bulevar vojvode Petra Bojovica 1A, Banja Luka, Bosnia-Herzegovina
[2]Ministry of Agriculture, Forestry and Water Management, Government of Republic o, Trg Republike Srpske 1, Banja Luka, Bosnia-Herzegovina

Corresponding author email: milan.sipka@agro.unibl.org

Abstract

The main objective of this study was to determine the degree of land suitability for apple growing on the area of Gradiška city and zoning of the studied area using a modified FAO methodology for land suitability assessment using the Geographic Information System tool (GIS). Soil parameters that were used are: slope, texture, soil depth, reactivity and organic carbon content. In addition, field surveys were conducted, with soil sampling and laboratory analyzes for 101 samples in order to thicken and update the network of existing pedological profiles and semiprofiles from the Basic Pedological Map (OPK) of the SFRY located in the sections covering the studied area. As a result, thematic maps were prepared for each parameter individually, as well as synthesis maps of land suitability for apple growing, for whose creation, along with defined soil parameters, apple requirements and limits were taken into account. Land suitability degree is defined by classes: P1, P2, P3, P4 and N.

Key words*: soil, Gradiska, suitability, crop, GIS.*

RESEARCH ON THE BIOLOGY OF *LOBESIA BOTRANA* (DENIS AND SCHIFF.) IN THE CONTEXT OF THE NEW CLIMATIC CONDITIONS IN MOLDOVA - ROMANIA

**Ion Alfred ȘTEFAN, Mihai TĂLMACIU,
Nela TĂLMACIU, Monica HEREA**

"Ion Ionescu de la Brad" University of Life Sciences of Iasi,
3 Mihail Sadoveanu Alley, Iasi, Romania

Corresponding author email: monica28is@yahoo.com

Abstract

This paper reports the results obtained from the analysis of capture data using the TERASEYA FLY device for Lobesia botrana males (Denis and Schiffermüller). The research was carried out in the region of Moldova, within two plantations belonging to two representative wine basins in the country, being the Odobesti Vineyard and the Husi Vineyard. In the study areas, the vineyards (of Vitis vinifera L.) are cultivated mostly with quality wine varieties, predominantly in the Odobesti vineyard we meet the Muscat Ottonel variety, and in the Husi vineyard we meet the Fetească regala variety, which have also been the subject of research our. The main aim of the study was to investigate the dynamics and biology of L. botrana species inside vineyards and to assess the effect of new climate change on pest distribution. Pest prediction and warning models have been developed and tested to monitor the life cycle of L. botrana, integrating both biological and climatic information. The timing of the first appearance of adults and the hatching of the first eggs can be predicted by predictive models based on the temperature requirements of the stages. Unfortunately, the models of prediction based on the calculation of the sum of daily degrees of temperature are empirical and their robustness strongly depends on the environment in which they were validated. The alternative forecasting techniques are currently being developed, such as pest assessment in the study area using these modern digital farming techniques.

Key words*: vine moth, climatic conditions, pheromone atraBot.*

GREYISH OAK (*QUERCUS PEDUNCULIFLORA* K. KOCH) SMART FORESTS FROM DOBROGEA'S PLATEAU

Voichița TIMIȘ-GÂNSAC[1], Adrian PETICILĂ[2], Lucian DINCĂ[3]

[1]University of Oradea, Faculty of Environmental Protection, 26 Gen. Magheru Street, Oradea, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[3]"Marin Drăcea" National Institute for Research and Development in Forestry, 13 Cloșca Street, Brașov, Romania

Corresponding author email: apeticila@gmail.com

Abstract

Dobrogea Plateau is situated in southeast Romania, being bordered by Danube's Meadow and Delta at West and North. The climate is temperate-continental, with reduced precipitations (around 400 mm/year) and a silvosteppe and steppe vegetation. Climate-Smart Forestry (CSC) is a branch of the forest's smart management that focuses on the response of forests towards climatic changes. In the present article, this is adapted to Greyish oak. Greyish oak smart forests are characterised by advanced ages (61-70 years) and even-aged stand structures. These forests are situated at altitudes between 51-100 m and 250-300 m, and on west and east expositions. The purpose study showed that Greyish oak can be included in the category of smart forests, by taking into account 13 elements (flora, soil and forest type) and stand conditions (pruning, vitality, diameter and average height, functional group, litter). As Greyish oak resists well to drought and grows relatively well, the species is important for improving the climate and conserving forests from the silvosteppe.

Key words: *age,altitude,greyish oak, smart forests,structure.*

COMPARATIVE STUDY OF TEXTURAL PROPERTIES OF ORIGINAL BREADS CONTAINING VEGETABLES POWDERS AND ROMANIAN COMMERCIALLY AVAILABLE RYE BREAD

Georgiana-Roxana TOMOȘOIU, Stelica CRISTEA, Corina Nicoleta PREDESCU, Liliana TUDOREANU

University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: roxana.ghibaldan8@gmail.com

Abstract

Functional and personalized foods have generated a growing interest for the general public and nutritionists. Bread is one of the most popular food being a versatile option for developing functional and personalized assortments. Vegetables powders of spinach, grape seeds, tomato seeds, carrot, tomato fruits, beetroot or broccoli have been added to bread dough to improve its phenolic content, textural properties, storage and shelf life. The present research is comparing the textural properties of three assortments of commercially available Romanian sliced rye bread (FT, SV, CR), which is a healthier alternative to wheat bread, with three assortments of manufactured white bread containing lyophilized powder of hawthorn (P2) and rosehips berries (P3) and grapeseed powder (P4). Cohesiveness was significantly different between the original assortments and the commercial ones however the cohesiveness of the P2, P3 and P4 bread assortments were not significantly different. No significant difference was also observed for the cohesiveness of the FT, SV and CR rye breads. The springiness index was not significantly different between all tested breads (P = 0.198), however the chewiness of P4 was significantly different compared to the commercial assortments but not significantly different compared to P2 and P3. The lack of difference between the springiness index of the two groups of beads indicates that the proposed original bead assortments can be a healthier alternative to rye breads, thanks to their exceptional phenolic content and mineral concentrations.

Key words*: bread, lyophilized hawthorn and rosehips berries, grapeseed powder, textural properties, phenols.*

CITIZEN SCIENCE AS A TOOL FOR MANAGEMENT OF ALIEN PLANT PESTS IN BULGARIA

Rumen TOMOV

Faculty of Agronomy, University of Forestry, 10 Kliment Okhridsky Blvd., 1756, Sofia, Bulgaria

Corresponding author email: rtomov@yahoo.com

Abstract

The risk of introducing alien plant pests (APP) in Bulgaria is constantly increasing due to the trade of plants and plant material and climate change. Phytosanitary measures successfully prevent the introduction of quarantine and regulated non-quarantine pests in Bulgaria but there is a risk of introduction of non-regulated plant feeding insects already established elsewhere in Europe. The good awareness about the pathways and negative impact of alien plant pests (APP) are crucial for early detection and prevention of their introduction and spread. Citizen science (CS) play an important role in awareness raising and engagement of different stakeholders in the management of APP. The COST Action CA 17122 'Increasing understanding of alien species (AS) through citizen science', has addressed multidisciplinary research questions in relation to developing and implementing CS. To facilitate the implementation of this COST Action in Bulgaria, the project "State and perspectives of citizen science for invasive alien species in Bulgaria" supported by the National Science Fund of Bulgaria has been launched in 2019. An analysis of the SC initiatives and level of awareness for APP in Bulgaria is presented. Based on a questionnaire survey, it is found that the main reasons for the failure to participate in SC initiatives are the lack of accessible information on the problems posed by the APP and the lack of tools and initiatives for the SC dedicated to APP in Bulgaria. Recent activities, aiming at changing public attitude towards the problem of the introduction of APP and involvement of the general public in SC activities for prevention of the introduction of APP in Bulgaria are presented.

Key words*: invasive species, priority pests, awareness.*

ESTABLISHMENT OF NATIONAL INFORMATION SYSTEM OF PLANT GENETIC RESOURCES IN BULGARIA

Nikolaya VELCHEVA[1], Katya UZUNDZHALIEVA[1], Asya STOYANOVA-DOYCHEVA[2], Pencho MALINOV[2]

[1]Agricultural Academy, Institute of Plant Genetic Resources "K. Malkov", 2 Druzhba Str., 4122, Sadovo, Plovdiv district, Bulgaria
[2]Plovdiv University "Paisii Hilendarski", Faculty of Mathematics and Informatics, Department of Computer Systems, 236 Bulgaria Str., Plovdiv, Bulgaria

Corresponding author email: nikolaya_velcheva@abv.bg

Abstract

Preservation and use of plant diversity is one of the global priorities for the development of sustainable agriculture in climate change conditions. During the period 1982-2021 in the National Genebank in Sadovo 53,545 accessions of cultural and wild plant species were stored. The enrichment of plant genetic resources collections in recent years has been focused on local traditional varieties, mainly by vegetable crops. The paper presents the status of conserved plant gene pool in Bulgaria in connection with optimization of the managing process of germplasm storage, study, reproduction, free exchange and use via establishment of an information system with specialized software. The created architecture follows the international standard of FAO/Bioversity. Passport data includes taxonomic description, biological status and origin of the accessions. The information system uses ontologies for facilitated free access and security of records through innovative blockchain technologies. As a result, the functionality of the documentation process as well as access to the plant gene pool to all stakeholders, in accordance with International Treaty on Plant Genetic Resources for Food and Agriculture and the Nagoya Protocol, is guaranteed.

Key words: *descriptor, documentation, EURISCO catalogue, ex situ collections, local plant genetic resources.*

REVIEW: ACTUAL APPROACHES FOR THE CRAFT BEER FERMENTATIONS

Carmen-Rodica VRÎNCEANU[1], Iuliana Diana BĂRBULESCU[1], Florentina MATEI [1], Mihaela BEGEA[1, 2], Valerica TUDOR, Mihai FRÎNCU[1], Răzvan Ionuț TEODORESCU[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania
[2]University Politehnica of Bucharest, 313 Splaiul Independentei, Bucharest, Romania

Corresponding authors emails: camivrinceanu@yahoo.com, ela_begea@yahoo.com

Abstract

The present paper describes some studies regarding the potential of some conventional and non-conventional brewing and wine yeasts for their application in the craft beer process. The artisanal or the craft brewing industry has grown in the last decade. The representative microorganisms for the production of craft beers are Saccharomyces yeasts. Nevertheless, the non-Saccharomyces yeasts became important for the particular aromatic profile of craft beer, through the increased customer's experience and also for the potential health benefits such as the probiotic effect. The objectives of this paper were to screen the reported data regarding the general behavior of the microorganisms involved in craft beer production, such as the fermentative capacity to produced alcohol, flavors and the probiotic effects, including the general analytic assays. Starting from this research, studies will be opened for–innovative pathways of using yeast strains isolated from vineyard and winery environment in artisanal beer production.

Key-words*: Craft beer, yeast, Saccharomyces and non-Saccharomyces, brewing*

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