University of Agronomic Sciences
and Veterinary Medicine of Bucharest

Faculty of Horticulture

International Conference

"Agriculture for Life, Life for Agriculture"

BOOK OF ABSTRACTS

Section 2

HORTICULTURE

2023
Bucharest

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SUMMARY

FRUIT GROWING

VITICULTURE AND OENOLOGY

VEGETABLE GROWING

FLORICULTURE, ORNAMENTAL PLANTS, DESIGN AND LANDSCAPE ARCHITECTURE

MISCELLANEOUS

FRUIT GROWING

EVOLUTION OF DRIP IRRIGATION SYSTEMS USING AT CHERRY PLANT IRRIGATION IN KONYA-AKŞEHİR AND AFYON-SULTANDAĞI PROVINCES, TÜRKİYE

Bilal ACAR[1], Nasuh AçıK[2], Gülsüm DERELI[2]

[1]Selçuk Üniversitesi-42130, Konya, Türkiye
[2]Netafim, CS, Türkiye

Corresponding author email: biacar@selcuk.edu.tr

Abstract

The paper aimed to assess drip irrigation systems used for irrigation of cherry plants in Konya-Akşehir and Afyon-Sultandağı provinces, Türkiye. The overall results showed that seasonal applied water for plants were determined as 172.8 mm. The evapotranspiration of cherry plants in region during cycles Mid April- August was calculated as 513 mm. The effective rainfall was determined as 149.35 mm in such period. Therefore, 190.85 mm water was met from the current soil moisture within the plant rooting depth. The cherry fruits have been harvested before the mid-June so after that period in regions, irrigation water with small amount have been applied as supplement irrigation. In that context, it is possibly to say that cherry plants in region has used much water from the water stored within the plant rooting depth during the late Autumn and winter seasons so applied water. In accordance of low irrigation water application, cherry plants have high contributions on sustainable utilization of water resources in water scant environments such as Akşehir and Sultandağı provinces of Türkiye.

Key words*: research, drip irrigation systems, cherry gardens, irrigation water management.*

REACTION OF PLUM CULTIVARS AND ROOTSTOCKS TO BACTERIAL BLIGHT (*PSEUDOMONAS* SP.*)*

Diyana ALEKSANDROVA, Marieta NESHEVA, Nataliya DIMITROVA

Fruit Growing Institute - Plovdiv, Ostromila 12, Plovdiv, Bulgaria

Corresponding author email: aleksandrova_diyana@abv.bg

Abstract

The bacterial blight caused by the gram-negative bacteria Pseudomonas sp. is a significant problem in stone fruit orchards. The resistance or tolerance of the cultivars is one important strategy for disease control. In the frame of a study conducted with the support of the BNSF, administrative contract КП-06 М 46/2, was compared the reaction of plum cultivars and rootstocks, after inoculation with the bacterial pathogen Pseudomonas sp. Flowers and shoots of the cultivars 'Topgigant Plus' and 'Jojo' grafted on the two rootstocks - 'Docera 6' (Prunus domestica L. x Prunus cerasifera Ehrh.) and the seedling myrobalan plum rootstock (Prunus cerasifera Ehrh) were artificially inoculated. In addition, two years old rootstocks 'Docera 6', seedling P. cerasifera and 'Myrobalan 29C' (Prunus cerasifera) also were inoculated with bacterial suspension. The cultivar 'Topgigant Plus' had lower susceptibility to flower infection when grafted on the seedling rootstock than 'Docera 6'. The reaction of rootstocks fourteen days after inoculation showed a lesion diameter of 400 mm on 'Docera 6', 433 mm measured on 'Myrobalan 29C', and 41 mm on the seedling rootstock P. cerasifera.

Key words*: artificial inoculation, 'Docera 6', 'Jojo', 'Myrobalan 29C', Pseudomonas sp., 'Topgigant Plus'.*

CANES WILTING WITH COLLAR AND ROOT ROT OF RASPBERRY CAUSED BY *PHYTOPHTHORA PSEUDOCRYPTOGEA* IN BULGARIA

Zhelyu AVRAMOV[1], Aneta LYUBENOVA[2], Kaloyan KOSTOV[2], Lilyana KOLEVA[1], Slavtcho SLAVOV[1, 2]

[1]Plant Protection Department, Faculty of Agriculture, University of Forestry, 10 Kliment Ohridski Blvd, 1797, Sofia, Bulgaria
[2]AgroBioInstitute, Agricultural Academy, 8 Dr. Tsankov Blvd, 1164, Sofia, Bulgaria

Corresponding author email: sbslavov@abi.bg

Abstract

A wide range of herbaceous and woody plant species are known as host plants of Phytophthora pseudocryptogea, *a relatively newly described species. Recently* P. pseudocryptogea *was isolated from raspberry plants in Bulgaria. Diseases plants were found in the 4 to 5 years old variety Ljulin plants on the biological production orchards in Kostenets region. Canes suddenly wilt and turn brown at the onset of warm temperatures. The plants manifested disease symptoms such as collar and root rot. The precise species determination of obtained isolate was done on the basis of the colony and asexual spores morphology and sequence analyses of the ITS region of the nuclear DNA. The pathogenicity of the fungus was tested by detached leaf bioassay on several raspberry cultivars in the laboratory.*

Key words*: raspberry, collar and root rot, Phytophthora pseudocryptogea, Bulgaria.*

CROWN SHAPING AND PRUNING OF SWEET CHERRY TREES WHICH OPTIMIZE THE RATIO BETWEEN GROWTH AND FRUCTIFICATION

Valerian BĂLAN[1], Vasile ŞARBAN[2], Igor IVANOV[1], Sergiu VAMASESCU[1], Corneliu BUZA[1], Dumitru TALPALARU[1]

[1]Technical University of Moldova, 168, Stefan cel Mare and Sfânt Blvd, Chisinau, Republic of Moldova
[2]Ministry of Agriculture and Food Industry,162 Stefan cel Mare şi Sfânt Blvd, Chisinau, Republic of Moldova

Corresponding author emails: valerianbalan@gmail.com, sarbanvasile@gmail.com, vindex_agro@yahoo.com, buza_cornel@mail.ru, sergiuvamasescu@mail.ru, roommobil@gmail.com

Abstract

The vigour of the variety-rootstock association, the crown shape, the planting distance, the age of the trees, and the tree pruning pattern have been examined. The studies regarding the establishment of sweet cherry orchards, as well as the growth and fruiting of the 'Valerii Cikalov', 'Record', 'Ferrovia', 'Kordia', 'Regina', 'Stella', 'Skeena', 'Bigarreau Burlat', 'Lapins', 'Early Star', 'Samba', 'Black Star' sweet cherry trees grafted on the Prunus mahaleb L., 'MaxMa 14' and 'Gisela 6' rootstocks, in different combinations and planting distances, have been carried out in the Southern and Central fruit-growing area of the Republic of Moldova. High vigorous trees are used on non-irrigated soils in association with self-fertile varieties at optimal planting distances that ensure high yields. The sweet cherry trees, grafted on the semi vigorous rootstocks ('Gisela 6') and the moderate vigour rootstocks ('MaxMa 14') are used on fertile soils and irrigated at high densities. They can provide medium vigour of trees, which can be handled completely from the ground level, produce early average yields, with low pruning and fruit harvesting costs due to increased labour productivity. The pruning done during the growing period resulted in the vegetative growth of the trees and the formation of fruiting branches that produced better flower buds compared to the pruning done during the dormant period. The rootstock-variety association should be chosen in accordance with the direct task, the growing system and the applied technology.

Key words*: Cerasus avium, variety, rootstock, crown shape, density, cultivation system.*

THE ALMOND, PRESENT AND PERSPECTIVE IN ROMANIA - A REVIEW

Mihaela BĂLUŢĂ, Florin STĂNICĂ

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

Corresponding author email: miha.baluta@yahoo.com

Abstract

The almond tree (Amygdalus communis L.) is a fruit species of great importance, which finds favourable growing conditions in certain areas in Romania and stands out due to the many properties of its fruit which have a long shelf life. Being a species that enjoys a real appreciation due to its nutritional and medicinal properties, shows interest to local fruit growers, making necessary providing some varieties with late flowering and the adoption of modern culture technoloes and the aim of this review is to present the current situation and to highlight the importance of relaunching the almond culture in Romania.

Key words*: almond, importance, varieties with late flowering, technologies.*

CONVERSION OF A VASE CANOPY INTO A PLANAR PARALLEL U, IN AN ALMOND ORCHARD - PRELIMINARY RESULTS

Mihaela BĂLUȚĂ, Florin STĂNICĂ

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

Corresponding author email: miha.baluta@yahoo.com

Abstract

The almond (Prunus dulcis (Miller) D.A. Webb) is a species that enjoys a real appreciation among farmers, due to its nutritional properties and high market prices. The almond orchards have to adopt modern cultivation technologies and to implement mechanization on large scale, as a priority. In this study, we presented the possibility of conversion of a high-volume vase canopy into a parallel U planar on. The conversion was performed in 2021 and 2022 in a young almond orchard at Constanța Research Station for Fruit Growing. Almond cultivars Veronica, Mirela, Tuono and Supernova, planted at 4.0 x 2.0 m, were used. The paper presents the preliminary results regarding trees growth and development, during conversion and the benefits of this process. The study is useful for fruit growers who want to transform their orchard for an easier management.

Key words*: Prunus dulcis, vegetative growth, flower shoots, summer pruning.*

THE LIGHT REGIME AND THE STRUCTURE OF THE CROWN OF THE GOLDEN DELICIOUS REINDERS AND RED VELOX APPLE TREE VARIETIES

Inna BILICI

Technical University of Moldova, 168, Stefan cel Mare și Sfânt Blvd, Chisinau, Republic of Moldova

Corresponding author email: biliciinna@gmail.com

Abstract
The given work relates to the study of the light regime and the structure of the vegetative composition in the Golden Delicious Reinders and Red Velox apple tree varieties. The solar regime in the crown of the apple trees of the studied varieties in the 4th year after their planting differs depending on the position of the sun in the sky, the distance from the ground and the length of the tree rows. The intensity of the solar radiation gradually increases from 9 o'clock till 13-15 o'clock, then decreases. The penetration of the solar energy into the crown increases from the base of the crown to the top of the tree. Based on the data obtained during the study, it can be asserted that the orchards in which trees have a height of 3.5-4.0 m and a crown width at the base of 1.0-1.2 m which decreases towards the top up to 0.8-1.0 m, form well-lit fruit-growing ecosystems, which receive in all areas of the vegetative ensemble more than 0.2 cal/cm^2 x min, i.e. as much as it is necessary for the photosynthesis process. The volume of the crown of the studied varieties depends on the vigour of the variety and the size of the trees. It provides light penetration to all elements of the crown, which allows.

Key words*: apple variety, light intensity, tree crown.*

APPLE TREES FERTILIZATION AND ITS INFLUENCE ON THE POTASSIUM CONTENT IN SOIL AND PLANTS IN CORRELATION WITH CALCIUM AND MAGNESIUM ABSORTION

Diana Elena BOLOHAN, Mariana VOLF, Elena Liliana CHELARIU, Lucian RĂUS

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

Corresponding author email: rauslucian@uaiasi.ro

Abstract

The paper presents how the soil fertilization with NPK in different doses and combined with two types of foliar fertilizers, applied to an apple tree orchard, changes the potassium content in soil and leaves. For a better understanding of the results, chemical analysis of the leaves and of the soil at two depths: 0-20 cm and 20-40 cm were chemically performed. The study was carried out in an apple orchard, located in the Didactic Farm "V. Adamachi" that belongs to the University of Life Sciences from Iasi (IULS), Romania. Results shows that fertilizers applied in the soil had a positive influence, increasing the soil content of potassium closer to the optimal range: 200-300 ppm. However, the content of potassium in the apple tree leaves stays low and below the optimum condition. The control (no fertilizers applied) had the lowest content for Kt (0.99%) in the leaves. Studying the content of calcium (mean - 1.65%) and magnesium (mean - 0.74%) in the dry matter of the leaves we see that there are not significant differences between the fertilization variants. Their values exceed the optimal limits.

Key words*: apple orchard, dry matter, foliar fertilizers, optimal content of potassium, NPK.*

TEXTURAL CHARACTERIZATION OF SOME NEW APPLE HYBRIDS TESTED IN THE EXPERIMENTAL ORCHARD OF USAMV OF BUCHAREST

Roxana BRÂNDUŞ, Andreea CHITIMIA, Bianca MÂNDREANU, Sorin Gabriel DINU, Alberto CIOBANU, Florin STĂNICĂ, Adrian Constantin ASĂNICĂ, Ana Cornelia BUTCARU, Liliana TUDOREANU

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

Corresponding author email: liliana_tudoreanu223@yahoo.com

Abstract

Apples textural characteristics are among the most appreciated quality parameters by consumers. The aim of this research was to compare the textural characteristics of four apple hybrids (H14/0, H4/17, H1/12, and H14/11) cultivated in the experimental orchard of USAMV of Bucharest. Ten apples from each hybrid were tested for hardness, fracture force, chewiness, cohesiveness and stiffness by double compression. The sensory textural profile analysis (ISO11036:2020) was conducted by 6 panellists. The main textural attributes identified were: hardness and fracture at first bite between incisive and hardness, chewiness, juiciness, palatability, skin thickness, after 3 mastication. The hybrid H1/12 had the highest hardness (115.5N±24.44N) and H14/0 had the lowest hardness (84.1N±15.9N) (double compression test). There was a borderline significant ($p = 0.046$) correlation ($r = 0.71$) between hardness at first bite and instrumentally measured hardness during the first compression for the apple hybrid H14/0. The apples hybrids had significant different hardness ($p<0.001$) and a borderline difference for pulp fracture force ($p = 0.044$). Following the panellists preference analysis, the most appreciated apple hybrids were both H14/11 and H1/12.

Key words*: textural parameters, sensory texture profile, correlation, Romanian apple hybrids.*

PEACH AND NECTARINE FRUIT CHARACTERIZATION FOR SEVERAL NEW CULTIVARS GROWN IN BUCHAREST AREA

Alexandru BUCUR, Ana Cornelia BUTCARU, Cosmin Alexandru MIHAI, Florin STĂNICĂ

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

Corresponding author email: anabutcaru@gmail.com

Abstract

Fruit physicochemical parameters are important for the evaluation of the new cultivars when tested in new planting conditions. The article presents the fruit's biochemical characteristics during four- year research (2019-2022) for 33 peach and nectarine cultivars. The orchard was established in 2017 in the Experimental Field of the Faculty of Horticulture in Bucharest with Romanian and foreign cultivars grafted on Myrobalan 29C, Saint Julien A, Adesoto, and GF677 rootstocks. Vertical Axis and Trident were used as planting systems and an integrated orchard technology was applied. For fruit evaluation, the size, average weight, flesh firmness, soluble solids (TSS - °Brix), dry matter (DM), titratable acidity (TTA), fructose and glucose content, and the index of absorbance (AI) were measured/determined. The results present the range intervals for all monitored parameters and the distribution of the cultivars on clusters depending on the physical and biochemical parameters. At the same time, the rootstock and system planting influence on the fruit parameters are highlighted.

Key words*: total soluble solids, dry matter, total acidity, DA-meter.*

METHODS OF EVALUATING THE CHILLING AND HEAT REQUIREMENTS OF APPLE AND PEAR TREES (REVIEW)

Ana Cornelia BUTCARU, Cosmin Alexandru MIHAI, Adrian Constantin ASĂNICĂ, Florin STĂNICĂ

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

Corresponding author email: mcosminalexandru@yahoo.com

Abstract

A challenge of climate change was given by the change in the occurrence of phenophases in fruit trees. Changes in average temperatures and rainfall, along with increased short- and long-term extreme events are already affecting crop yields around the world. To avoid possible losses, it is necessary to provide in real time useful information to farmers regarding the initiation of a certain stage of fruit tree development. Modern breeding programs have launched onto the market cultivars with low winter chill requirements, involving in recent years extensive zoning research. Also, there are species/cultivars with a chilling requirement that can no longer be satisfied in some areas, leading to losses in production/economic inefficiency. Climate change generated significant interest in the development of specific tools and models adjusted for each crop. The paper aims to present the available information on the chilling and heat requirements of apple and pear trees with a special focus on the methods used for their determination. The results reflect the comparison of the methods used and their efficacity for those species.

Key words*: chilling hours, chilling units, chilling portions, growing degree hours.*

CHILLING AND HEAT REQUIREMENTS OF TEMPERATE STONE FRUIT TREES (PEACH, NECTARINE, AND APRICOT) (REVIEW)

Ana Cornelia BUTCARU, Alexandru BUCUR, Imad Jabbar Wadi AL SUWAID, Cosmin Alexandru MIHAI, Adrian Constantin ASĂNICĂ, Florin STĂNICĂ

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

Corresponding author email: mcosminalexandru@yahoo.com

Abstract

Stone fruit trees (peach, nectarine, and apricot), like other temperate woody species, need to accumulate a specific amount of chilling during endodormancy, and of heat during ecodormancy for a proper growth and development. Each cultivar has specific requirements and a special attention is needed to know them for an optimal decision support system. The aim of this paper was to present the available information on chilling- and heat-requirements of peach, nectarine, and apricot with special focus on the methods used for their determination. The results reflected also the necessity to standardize the methodology with the possibility to extend to new cultivars tested in different areas.

Key words*: chilling hours, chilling units, chilling portions, growing degree hours.*

EVALUATION OF CHILLING AND HEAT REQUIREMENTS OF PAW-PAW (*ASIMINA TRILOBA* L. DUNAL) AND JUJUBE (*ZIZIPHUS JUJUBA* MILL.) (REVIEW)

Ana Cornelia BUTCARU, Andrei Florin TABACU, Rareş Cosmin PÂNDARU, Cosmin Alexandru MIHAI, Adrian Constantin ASĂNICĂ, Florin STĂNICĂ

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

Corresponding author email: mcosminalexandru@yahoo.com

Abstract

Climate change is a reality of the difficult period we are going through. Plant evolution is generally strongly correlated with variations in temperatures, precipitation, and solar radiation being affected by extreme events. Fruit production is influenced by late frosts, the number of cold hours (perhaps insufficient in recent years), and winter windows in which, very high temperatures occur and negatively influence the dormancy of some fruit-bearing species. Paw-paw (Asimina triloba L. Dunal) and jujube (Ziziphus jujuba Mill.) are new fruit species for Romania areas with more resilience to climate changes. This paper aims to present the available information on the chilling- and heat requirements of this new fruit species, with a special focus on the methods used for their determination. The results reflected the scarcity of research on these fruit species and the necessity to have a methodology with the possibility to extend to new cultivars in different areas.

Key words*: chilling hours, chilling units, chilling portions, growing degree hours.*

A DIGITAL SYSTEM TO MONITOR THE CANOPY IN SOME APPLE AND QUINCE CULTIVARS

Ana Cornelia BUTCARU, Doru Ionel DUMITRAŞCU, Cosmin Alexandru MIHAI, Adrian Constantin ASĂNICĂ, Florin STĂNICĂ

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

Corresponding author email: mcosminalexandru@yahoo.com

Abstract

Nowadays we still need to know thoroughly every link in the production chain in order to optimize it by reducing costs and allocating resources to develop important segments. WinSCANOPY is a system that analyses tree canopy through image analysis. The objective of this work is to present the influence of the planting system and the fruit tree species on certain canopy parameters (foliar index, direct, diffuse and total radiation) by monitoring the canopy projection in an apple and quince orchard. A secondary objective consisted in study of the canopy developing dynamic during a growing season in the analysed species. The results present the comparison between the parameters monitored in the four sides of the trees (North, East, South, and West) in three moments of the day and in five series in the vegetable season.

Key words*: non-destructive equipment, foliar index, direct, diffuse and total radiation.*

PROTECTIVE ACTION OF FILMS OBTAINED FROM BIOPOLYMERS WITH THE ADDITION OF PLANT BASED EXTRACTS

Marian BUTU[1], Steliana RODINO[1, 2], Alina BUTU[1], Gheorghe PETRE[3]

[1]National Institute of Research and Development for Biological Sciences, 296 Spl. Independentei, Bucharest, Romania
[2]Research Institute for Agricultural Economy and Rural Development, 61 Marasti Blvd, District 1, Bucharest, Romania
[3]Romanian Farmers' Association, 61 Marasti Blvd, District 1, Bucharest, Romania

Corresponding author emails: alina_butu@yahoo.com; steliana.rodino@yahoo.com

Abstract

Society`s growing interest in health-promoting products and the shift away from highly processed foods in favour of raw fruits and vegetables have contributed to the need to store larger quantities of agricultural products. Fruit and vegetable production in our climate is seasonal. However, from the point of view of rational nutrition, it is essential to consume them throughout the year. Therefore, consumer demands regarding the reduction of chemical food additives force researchers and producers to look for alternative natural substances with antibacterial and antioxidant properties. This paper presents an analysis on the effect of the addition of plant-based extracts to the polymer matrix of gelatine, chitosan and gelatine-chitosan films on their properties. The composition of edible coatings was assessed and examples of their use on selected fruits were provided. It was found that the protective layers applied just after the post-harvest period extend shelf life, regulate respiration, inhibit moisture loss, protect against pathogens and extend the shelf life of fresh fruits.

Key words*: edible films, operational group, fruits storage, apple production*

PRODUCTIVITY OF THE IDARED APPLE VARIETY DEPENDING ON THE CROP LOAD AT THE FRUIT THINNING

Oleg CALESTRU

Technical University of Moldova, 168, Stefan cel Mare și Sfânt Blvd, Chisinau, Republic of Moldova

Corresponding author email: oleg.calestru@gmail.com

Abstract

The experimental plot is placed in the orchard "Codru-ST" Ltd. founded in 2006. The study subject of the experience was Idared apple variety grafted on M 9 rootstock. The plant spacing is 3.5 x 1.2 m. The research was conducted during the period of 2014-2017 years. The active substances applied were NAD (Geramid-New), NAA (Dirager) and BA (Gerba 4LG), using different doses and different thinning periods. During the research, such indicators as the number and average weight of the fruit, the yield per tree and per unit area and the average fruit diameter were studied. It was established that, the spray with Geramid-New in dose 1.2 l/ha when 80% of the petals have fallen + 2-3 days, Dirager in dose 0.2 l/ha when the king fruit diameter was 8-9 mm, and Gerba 4LG in dose 2.0 l/ha when the king fruit diameter was 10-12 mm have a significant effect on the number of the fruits, average weight, yield and fruits diameter.

Key words*: growth regulators, thinning, average weight, yield, fruits diameter.*

RESEARCH ON THE MONITORING THE ATTACK OF *COCCOMYCES HIEMALIS* SIN. *BLUMERIA JAAPI* IN SOME VARIETIES OF CHERRY

Simona Mihaela CHELARU[1], Cristina Ionela TURCU[2], Andreea Mihaela FLOREA[2], Eugen ULEA[2], Ionel PERJU[2]

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

Corresponding author email: ing.cristinaboboc@gmail.com

Abstract

Research on the monitoring of the pathogen Coccomyces hiemalis sin. Blumeria jaapi took place on the territory of the Research Station for Fruit Growing Iasi, within the research polygon. The observations were made on 4 varieties approved at SCDP IASI and belong to the category of early ripening varieties. The Cetățuia, Cătălina, Andreias, Cociuvas and Mihailis varieties were studied, their monitoring began in May, analyzing 3 trees of each variety, 300 leaves from each tree in three repetitions, observing the frequency and intensity of the pathogen`s attack. During the growing season of 2022, 4 treatments with fungicides, insecticides and foliar fertilizers were used for phytosanitary maintenance. Following the observations made, the analyzed varieties recorded a minimum degree of attack of 0.825% on the Cetățuia variety and the highest of 1.63% for the Mihailis variety. The low degree of attack was due to the earlyness of the varieties studied.

Key words*: anthracnose, cherries, degree of attack, phytosanitary protection.*

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

Anca Maria CHIOREAN[1, 2], Zsolt JAKAB-ILYEFALVI[1], Smaranda ROŞU-MAREŞ[1, 2]

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

Corresponding author email: ancasofron09@gmail.com

Abstract

Supplying the trees with the optimal amount of nutrients is very important in order to obtain high quantity and high quality yields every year. Prohexadione-Ca is a dual-acting substance that is both a growth regulator and an activator of the natural defense mechanisms of apple trees against pests and diseases. The influence of this compound combined with radicular or foliar fertilizers was evaluated in three apple cultivars:'Idared', 'Generos' and 'Florina' grafted on medium vigour M26 rootstock. The applied technology in the experimental plot included chemical treatments against the main pests and diseases which commonly affect apple orchards in Northern Transylvania. Different fertilization methods combined with this growth regulator led to a reduction of length of the terminal shoots with direct influence on labour costs and efficiency of orchard management. The results obtained during 2019-2022 revealed the benefits of supplying apple trees with foliar and soil fertilizers for the cultivars to maintain a high productive potential.

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

SWEET CHERRY FRUIT CRACKING - A CHRONIC PROBLEM IN THE ERA OF CLIMATE CHANGE

Mihai CHIVU[1], Adrian ASĂNICĂ[2]

[1]Research Institute for Fruit Growing Piteşti, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: asanica@gmail.com

Abstract

Scientific and applied interest in sweet cherry fruit cracking has increased markedly in the last decades, due to the increase in production and cultivated area and its increasing incidence due to new climate changes, but the causes are still less well understood including the management strategies to prevent the incidence of the disorder in susceptible cultivars. Hailstorms and heavy rainfall after a long period of drought which are associated with new climate changes might increase fruit cracking. Other factors involving fruit characteristics or some cultural practices are also influencing fruit cracking. The responses of the trees to the application of some compounds (minerals, anti-transpirants and growth regulators) just before harvesting, vary according to the variety, application time, concentration and their type, which makes it difficult to generalize their effects, in addition to their effectiveness it is not high and sometimes even counterproductive. This review explores factors contributing to fruit cracking in sweet cherry, report advances recommended measures to reduce this disorder, and suggests directions for future research.

Key words*: climate changes, fruit cracking, rainfall, sweet cherry.*

THE INFLUENCE OF THE TYPE OF CUTTING IN THE RASPBERRY SPECIES ON THE QUALITY OF THE PRODUCTION OBTAINED

Mihai CICHI, Dorina BONEA

University of Craiova, Faculty of Agronomy, Agricultural Technology & Forestry, Liberty Street No 19, Craiova, Romania

Corresponding author email: dbonea88@gmail.com

Abstract

Even though raspberry cuts are simple, opinions differ when it comes to raspberry cuts. In general, for the exercise of a modern orchard, the varieties must be adapted to modern mechanization and soil maintenance technologies. Following the research carried out, we can specify the fact that the Cayuga variety has a high drajon capacity, and a greater shortening of the stems leads to a decrease in drajon production. In the variants where the inflorescences were not removed, the production of raspberry stems does not decrease. The quality of the raspberry stems was influenced to a very small extent by the removal or not of the inflorescences. The root system of the raspberry is more superficial, the vast majority of the roots, about 80% of the roots are located closer to the soil surface, respectively in the soil layer between 0-20 cm. An intense growth of raspberry stems takes place in the months of May-June and the beginning of July, but along the way the pace of growth slows down, thus at the end of August their growth stops.

Key words*: raspberry species, variety, shortening, quality.*

EFFECT OF ORGANIC FOLIAR FERTILIZERS ON YIELD AND FRUIT QUALITY OF SEVEN HIGHBUSH BLUEBERRY (*VACCINIUM CORYMBOSUM* L.) CULTIVARS

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

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Boulevard, District 1, 010464 Bucharest, Romania
[2]Research Institute for Fruit Growing Piteşti, Romania

Corresponding author email: claudianicola54@gmail.com

Abstract

*Consumer-valued blueberry fruits are increasingly sought after for consumption in fresh or processed form due to their beneficial effect on human health, as supported by extensive scientific evidence. In this study we looked at the effect of organic foliar fertilizers on production and on the quality parameters of fruit in seven blueberry varieties. The experiment was carried out at ICDP Piteşti-Mărăcineni, over the course of the years 2020-2022, on a plantation established in 2018, and was presented in a randomized block design with three repetitions and three fertilization variants: control group (untreated), Codamix (0.25%), and Ecoaminoalga (0.25%). The treatment was repeated three times at an interval of 14 days, beginning with the formation of the bud until the start of fruit ripening. At the harvest time, production data and the following quality indicators were measured and recorded: fruit mass, firmness, color, soluble dry matter content, total titratable acidity, and total sugar content. The results showed that organic fertilizers had a positive effect on both the quantity and quality of blueberry fruits produced during this study***.**

Key words*: blueberry, organic fertilizer, production, fruit quality.*

STUDY REGARDING THE BEHAVIOR OF THREE CHOKEBERRY CULTIVARS (*ARONIA MELANOCARPA*) CULTIVATED IN ORGANIC SYSTEM

Dragomir DAMIAN[1], Florin STĂNICĂ[2]

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

Corresponding author email: dragomir.damian@scdpbaneasa.ro

Abstract

The paper presents data related to the evolution of three chokeberry Aronia varieties, grown organically in the farm belonging to FRDS Băneasa, located in N-E of Bucharest in Afumați, Ilfov County, in the Vlasiei Plain, a subunit of the Roman Plain. Aronia melanocarpa, is a crop that is suitable for organic system, and the importance of fruits is given by the fact that it has special nutraceutical qualities, mainly due to the high contain of anthocyanins and flavonoids among other important substances that can reduce the risk of serious illness. The study was continued on a plantation established in 2020. The chokeberry varieties under observations were: Melrom, Nero and Galicjanka. Planting distances 1.5 m/3 m, in 2 variants, plants canopy conducted as bush. In 2022, number of shoots and inflorescences per plant, shoots length and the number of fruits per inflorescence were counted. Also, fruit weight, size, sugar content, pH and citric acid for each variety was determined and compared to the 2021 results. The study will continue in order to gather more data for the organic cropping system of Aronia.

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

THE EFFECT OF SOME FOLIAR FERTILIZERS ON THE BIOMETRIC CHARACTERISTICS OF THE FRUITS OF PEACH VARIETIES *(P. VULGARIS* L.) GROWN IN THE PEDOCLIMATIC CONDITIONS OF LUGOJ, TIMIȘ COUNTY

Ionuț DASCĂLU, Olimpia Alina IORDĂNESCU, Adina BERBECEA, Alexandra BECHERESCU, Isidora RADULOV

University of Life Sciences "King Mihai I" from Timişoara,
119 Calea Aradului Street, 300645, Timişoara, Romania

Corresponding author email: olimpia.iordanescu@yahoo.com

Abstract

Foliar fertilizers play a very important role in obtaining quality harvests and present more and more benefits that increase the resistance of plants to diseases and pests and implicitly to reduce the number of treatments with fungicides and insecticides that have a negative impact on the environment. In order to carry out the research, two lesser-known peach varieties, 'Piros Magdalena' and 'Gold Dust' were studied. The varieties were treated with four foliar fertilizers in three different growth phenophases: the phenophase of intense shoot growth, the phenophase of fruit growth and before fruit ripening. The foliar products used were the following: Albit (organic product), Cropmax (organic product), Foliq N Universal and Solfert. Regarding the fruit mass, among the biological fertilizers, in both varieties, the best results were obtained with the Cropmax fertilizer, and among the chemical fertilizers, the best results were obtained with the Solfert fertilizer in the 'Gold Dust' variety, and with Foliq N Universal fertilizer in the 'Piros Magdalena' variety.

Key words*: fertilizer, peach, fruit mass, 'Gold Dust', 'Piros Magdalena'.*

TEXTURAL CHARACTERIZATION OF SOME PEAR CULTIVARS CULTIVATED IN THE EXPERIMENTAL ORCHARD OF USAMV FROM BUCHAREST

Sorin Gabriel DINU, Roxana BRÂNDUŞ, Andreea CHIŢIMIA, Bianca MÂNDREANU, Alberto CIOBANU, Florin STĂNICĂ, Adrian ASĂNICĂ, Ana BUTCARU, Liliana TUDOREANU

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

Corresponding author email: liliana_tudoreanu223@yahoo.com

Abstract

Fruit tree propagation methods by grafting use specific rootstocks with different vigor scales which will influence fruit yield and quality, precocity, disease resistance and fruits' textural profiles. Magnus-Taylor probe (flat and semi-spheric tip) puncture tests, compression tests and sensory profile texture analysis were performed on fruits of two variants of Euras cultivar grafted on quince (CTS 212) (Euras/Q-20, Euras/Q-21), Euras on own roots (Euras/Or-21), Abate Fetel cultivar grafted on pear (`Farold®40`), and Arvena cultivar grafted on pear. Statistics software used: MedCalc and JMP. The bioyield puncture force (BPF) is highly significant ($p<0.001$) for all cultivars for the flat tip probe puncture test. The highest BPF was for Euras/Or-21 (86.23N ±7.71N) and the lowest for Arvena (11.65N±2.88N). The BPF values were influenced by probe's tip profile. Arvena pear's textural attributes was the mostly appreciated. Although there are many reports on pears textural parameters, the data cannot be compared or used for quantitative meta-analysis due to the experimental conditions' variability. Therefor there is a strong need for testing standards for fruits and vegetables texture.

Key words*: pears, grafting, puncture tests, bioyield force, sensory analysis.*

REPRODUCTIVE MANIFESTATIONS OF FLORINA APPLES BY CONVENTIONAL FARMING

Galya DOBREVSKA, Vera STEFANOVA, Manol DALLEV

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

Corresponding author email: vera.v.stefanova@abv.bg

Abstract

There are a number of innovative projects looking for techniques that can improve production while reducing resource input and impact on the environment. A study is made of growth and reproductive manifestations of apples (variety Florina) on the territory of the, Plovdiv region, Bulgaria country. Conventional production is applied in two variants of area - on cultivated area and on grassplot area. The following parameters regarding the growth parameters of Florina apples are monitored: cross-sectional area of the stem, average weight of fruit, number of fruits per tree, productivity coefficient. The different indicators give a different reflection in the two variants of area, but in the same conventional production. The average weight of fruit, number of fruits per tree and the coefficient of productivity give better results on growing apples in a grassplot area. The indicator `cross-sectional area of the stem` presents better values when growing apples on a cultivated area. The results are visualized by presentation in a digital technology, using Geographic Information Systems (GIS), with the aim of faster and rational use by modern farmers.

Key words*: apple reproductive manifestations, conventional production, cultivated area, grassplot area, GIS.*

THE CONTROLLED POLLINATION BEHAVIOR OF SOME INDIGENOUS VARIETIES OF CHERRY IN THE CONDITIONS SCDP BĂNEASA BUCHAREST

Florentina DOBRINESCU, Lenuța Constantina CHIRA, Daniel NAGY, Ligia ION

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

Corresponding author email: florentina_dobrinescu@yahoo.com

Abstract

With a total remaining area of approximately five thousand hectares, after the existence of approximately 6900 ha with cherries was shown in 2013, Romania continues to be a country with relatively good productivity in terms of obtaining cherries. The cherry tree germplasm fund is part of the plant biodiversity that has developed over time in nature in a spontaneous and controlled way and that is the basis for the permanent improvement of cultivated varieties. The activity of collecting and preserving biological material in organized collections has a long tradition. The importance of this biological material is substantial, especially when we talk about the interaction of these genotypes with quarantine viruses, especially Plum pox virus, considered the most devastating. The pollination scheme used under SCDP Baneasa Bucharest conditions included one pollinating variety, Boambe de Cotnari, and four controlled pollinated varieties, Daria, Izverna, Superb and Severin.

Key words*: pollen, hybridization, fruits, quality*

THE EFFECT OF FERTILIZERS ON THE QUALITY OF APPLE FRUITS

Ana Maria DODOCIOIU, Gilda-Diana BUZATU

University of Craiova, Faculty of Horticulture, A.I. Cuza Street, no. 13, Craiova, Romania

Corresponding author email: diana_buzatu@yahoo.com

Abstract

In the period 2019-2021, the effect of different doses of complex fertilizers of the 16:16:16 type applied alone and together with some foliar fertilizers of the Fertil Star and Aurora types on the production, quality and accumulation of some nutrients in the leaves of the Florina apple variety was monitored, cultivated on a cambic faeziom soil type from Mehedinți. The productions were obviously marked by the complex application of the 3 macroelements, being between 20.35 t/ha and 25.61 t/ha. A clear influence of fertilization on the total dry matter content was found, between 11-17%, the increase being directly proportional to the intake of nutrients from the applied fertilizers. High concentrations of K cause their acidity to increase, which has the consequence of changing the ratio of sugar/organic acids and finally changing the taste in the sense of increasing the flavor. Nutrient elements in the leaves changed favorably as a result of the application of doses and types of fertilizer.

Key words*: apple, fertilizers, quality.*

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

Mihaela DOGARU[1, 2], Damian DRAGOMIR[2], Maria Marinela DRAGNEA[2], Mihaela POSTOLICI URSACHI[2]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania
[2]Research and Development Station for Fruit Tree Growing Băneasa, 4 Ion Ionescu de la Brad Blvd, District 1, 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. The paper presents data related to the identification of the most adapted variety for the Vlăsia Plain area. Thus, in 2020, was established in the farm belonging to FRDS Băneasa, located in N-E of Bucharest in Afumați, Ilfov County an experimental plot with 6 blackberry varieties (Dar 8, Thorn Free, Chester, Triple Crown, Polar, Navaho) planted in the planting scheme 1.0 m/3 m. From each variety, during 2022, was harvested ripe fruits and was made biometric determinations in the laboratory, measuring fruit weight and diameter, firmness, citric acid and pH. The results obtained in 2021 of these indicators was compared with the results of 2022. The study will continue so that statistical analyzes can be performed.

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

DEPENDENCIES BETWEEN VEGETATIVE AND REPRODUCTIVE PERFORMANCES IN 'SHOPSKA ALENA' RASPBERRY CULTIVAR

Diyan GEORGIEV, Maria GEORGIEVA, Denitsa HRISTOVA

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

Corresponding author email: d.georgiev.slujeben@gmail.com

Abstract

The scientific experiment was conducted during the period of 2018-2020 in a collection plantation of the Research Institute of Mountain Stockbreeding and Agriculture in Troyan. The object of the study is the 'Shopska alena' raspberry cultivar. The plantation was created in the autumn of 2016. Correlation analyzes were made between the vegetative indicators: number, height and thickness of the shoots with the yield. The highest values for height (1.38 m) and thickness (8.41 mm) of the shoots were recorded in the second year of the experiment, and the highest yield was obtained in the third year - 1.69 kg/1 m^2. A high correlation dependence between the height and thickness of the shoots was recorded through all three years and between the height and thickness with the yield in the second and third year.

Key words*: cultivars, fruits, raspberries, reproductive indicators, vegetative indicators.*

CORRELATIONAL INTERCONNECTIONS BETWEEN VEGETATIVE AND REPRODUCTIVE PERFORMANCES IN RASPBERRY CULTIVAR 'TULAMEEN'

Maria GEORGIEVA, Diyan GEORGIEV, Denitsa HRISTOVA

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

Corresponding author email: mariageo@gmail.com

Abstract

The scientific experiment was conducted in the period 2018 - 2020 in a collection plantation of the Research Institute of Mountain Stockbreeding and Agriculture in Bulgaria. The plantation was created in the autumn of 2016. The planting scheme of the plants is 3.00/0.50 m. The objective of the study is 'Tulameen' cultivar. Vegetative parameters were monitored: average number of shoots, average thickness and average height of shoots and reproductive: average fruit weight and yield per linear meter. The number of shoots had the highest values in the first year of the experiment (29.33), and their height (1.51 m) and thickness (7.60 mm) in the second year. The highest yield was recorded in the third year (1.48 kg/1 m^2). A high to very high positive correlation between shoot height and thickness was reported in all three years. In the first year, a high correlation dependence was registered between shoot height and yield (0.76) and negative in the second (-0.85) and third (-0.51) years of the experiment.

Key words*: cultivar, fruit weight, raspberry, vegetative indicators, yield.*

DETERMINATION OF THE HEAT REQUIREMENTS DURING THE ECODORMANCY FOR THE CHERRY (*PRUNUS AVIUM*) IN BULGARIA

Veska GEORGIEVA, Petya MALASHEVA, Valentin KAZANDZHIEV

NIMH, Tsarigradsko shose 66, Sofia, Bulgaria

Corresponding author email: petia.sredkova@meteo.bg

Abstract

The sweet cherry (Prunus avium), like other fruit species in the temperate climate, need to accumulate a cultivar-specific quantity chilly units during the endodormancy, and heat units during ecodormancy for breaking of dormancy and flowering properly in spring. The knowledge of chilly and heat requirements is important in the selection of the appropriate cultivars for the production a particular area. This study aims to estimate growing degree hours (GDH) requirements up to flowering for 12 cherry cultivars grown in the basic regions of industrial cherry production in Bulgaria. Phenological and hourly temperature observations for nine years (2001-2010) were used to perform this study. The GDH were calculated as sum of temperatures above 5°C accumulated from the breaking of dormancy to the flowering. The heat requirements (HR) for flowering ranged between 1908-3868 GDH. The results indicate that flowering time of cherry in the studied regions is influenced by GDH. Identification of cultivars with higher HR and later flowering is important for cherry production, especially in regions with frequent late spring frosts occurrence.

Key words*: phenology, temperature conditions, cherry, ecodormancy, growing degree hours (GDH).*

EVALUATION OF SOME SWEET CHERRY CULTIVARS GRAFTED ON 'GISELA 6' ROOTSTOCK

Nicolae GHEORGHIU[1], Ana-Maria STOENESCU[2], Sina Niculina COSMULESCU[1]

[1]University of Craiova, Horticulture Faculty, Department of Horticulture & Food Science, 13 A.I.Cuza Street, Craiova, Romania
[2]University of Craiova, Horticulture Faculty, Department of Biology and Environmental Engineering, 13 A.I. Cuza Street, Craiova, Romania

Corresponding author emails: sinacosmulescu@hotmail.com; anamaria_stoenescu@yahoo.com

Abstract

The results regarding the evaluation of the trunk cross-sectional area of the scion, the rootstock and the grafting point and the calculation of the morphological index of thickening of the grafting zone in 5 sweet cherry cultivars ('Early Lory', 'Early Bigi', 'Grace Star', 'Regina' and 'Kordia'), grafted on 'Gisela 6' rootstock, are presented in this paper. The research was carried out in a commercial orchard located in Orodel commune, Dolj County, South-West part of Romania. The orchard was established in 2013, with a planting distance of 4 x 1.8 m. Based on the results obtained, the morphological index of thickening of the grafting area fluctuated significantly depending on the cultivar, reaching the highest value in 'Regina' cv. (0.012), the lowest being recorded in 'Kordia' and 'Early Lory' cv. (0.008). The largest differences between the rootstock and the grafting point were recorded in 'Grace Star' cv. (approx. 147 cm^2), and the largest differences between the grafting point and the scion were recorded in 'Early Lory' and 'Kordia' cv. (approx. 32 cm^2).

Key words*: compatibility, symbionts, trunk cross-sectional area.*

ASSESSMENT OF FRUIT QUALITY AND BIOCHEMICAL COMPOUNDS OF SOME BLUEBERRY HYBRIDS

Oana HERA[1, 2], Monica STURZEANU[2], Loredana VIJAN[3], Răzvan TEODORESCU[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, 402 Mărului Street, Pitești, Argeș, RO 1, Romania
[3]University of Pitești, Faculty of Sciences, Physical Education and Computer Science, 1 Târgu din Vale Street, Pitești, Romania

Corresponding author email: oana.hera@yahoo.com

Abstract

Vaccinium corymbosum fruits are used as raw material for the food industry. It is known that the highbush berries, compared to lowbush blueberries, are richer in dry matter and total sugar content. During 2021-2022, at the Researsch Institute for Fruit Growing Pitești -Mărăcineni, Romania was organized a field trial with two genotypes and their progenies. Data were collected for: average fruit weight, size index, firmness, ph, total soluble solid, total sugar content, vitamin C, total polyphenol, flavonoid, antocyanin, lycopene and β-carotene content. The aim of this study was to compare the analysis of the fruit quality in hybrids of 'Simultan' and 'Northblue' cutivars. The results showed significant differences between progenies. The fruit weight varied between 0.82 and 2.05 g, the firmness oscillated between 8.13 and 28.27 N, total soluble solids reached a maximum of 17.43° BRIX, size index varied between 8.13 to 28.27, vitamin C content varied from 3.48 to 13,49 mg/100 g. Total polyphenol, lycopene and β-carotene content averaged 1296.66 mg GAE/100 g, 0.10 mg and 0.42 mg. For the blueberry breeding programme, biochemical evaluation of hybrids characteristics is an important objective.

Key words*: hybrids, biochemical compounds, highbush blueberry.*

IN VITRO CULTURE OF FIG (*FICUS CARICA* L.) - A REVIEW

Theodora HRIBAN, Florin STĂNICĂ

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

Corresponding author email: theo_hriban@yahoo.com

Abstract

Ficus carica, commonly called "fig" is a fruit species very well known since the ancient times. Native to the Mediterranean and Western Asia, during the centuries, spread around the world and now it is cultivated in many countries. Figs have an important role in the healthy diet due to their high nutrition and medicinal properties. Fig tissue culture developed in the second half of XXth Century being used mainly for fast propagation of important genotypes, for pathogen/virus elimination and for breeding purposes. The current review was carried out to show different types of in vitro cultures for fig species.

Key words*: culture media, micropropagation, multiple shooting, hormones.*

IN VITRO CULTURE OF KIWIFRUIT SPECIES (*ACTINIDIA* SP.) - A REVIEW

Theodora HRIBAN, Florin STĂNICĂ

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

Corresponding author email: theo_hriban@yahoo.com

Abstract

Actinidia deliciosa, known as kiwifruit, has gained a great popularity and demand due to its nutritional and medicinal value. Actinidia genus has at least three cultivated species with an important economic role. In vitro culture of kiwifruit species was an important tool for plant micropropagation and for unconventional breeding (direct organogenesis, callogenesis, somatic embryogenesis, cells culture, etc). The actual paper presents a comprehensive image of the main results that were achieved in different in vitro cultures of kiwifruit species. New alternative developments are being proposed in order to obtain efficient protocols of the species for production of clonal planting materials.

Key words*: callus, culture media, micropropagation, organogenesis, somatic embryos.*

VEGETATIVE AND REPRODUCTIVE CHARACTERISTICS OF BLACKCURRANT CULTIVARS AFTER CONVENTIONAL AND ORGANIC FERTILIZATION

Denitsa HRISTOVA, Diyan GEORGIEV, Maria GEORGIEVA

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

Corresponding author email: den_1986@abv.bg

Abstract

During the period 2020-2021 at the Research Institute on Mountain Stockbreeding and Agriculture in Troyan, organic and conventional fertilization was applied to blackcurrant cultivars Bogatir, Byurlovskaya, Ben Lomond and Ben Sarek. It was established that, for the period of the test, for blackcurrant cultivars Bogatir, Ben Lomond and Ben Sarek, the conventional growing technology had a greater average height and width of the bushes, compared to the control option and organic fertilization. On average for the test period, conventional fertilization has the highest average fruit weight, varying in the interval from 0.60g (Bogatir and Byurlovskaya) to 0.91g (Ben Sarek). As a result of the test, it was reported that the average yield from a bush of the Byurlovskaya and Ben Lomond cultivars was not affected by the fertilization technology. In the case of the Bogatir cultivar, the highest average yield was found with conventional fertilization (0.398 kg). The variety is not affected by the applied biological fertilization. Fertilization technologies influence the average yield of Ben Sarek cultivar.

Key words*: blackcurrant, cultivar, vegetative indicators, fruit weight, yield.*

THE INFLUENCE OF DIFFERENT ROOTSTOCKS AND PLANTING SYSTEMS ON SEVERAL APRICOTS CULTIVARS' GROWTH IN THE BUCHAREST AREA

Imad Jabbar Wadi IMAD AL SUWAID, Florin STĂNICĂ, Ana Cornelia BUTCARU

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

Corresponding author email: emadjabbar74@yahoo.ro

Abstract

This research was conducted on 23 apricot cultivars (Prunus armeniaca L.) in the Experimental Field of the Faculty of Horticulture in Bucharest.Myrobalan 29C (M29C), Saint Julien A (SJA), and GF677 rootstocks were used, with two different planting systems, Parallel-U and Trident. This study presentsthe biometric parameters, trunk cross-sectional area (TCSA), axis cross-sectional area (ACSA), canopy volume, and the total number and length of annual shoots under their influence. Generally, the cultivars grafted on M29C rootstock grew morethan those grafted on GF677 and Saint Julien A, regardless of the system planting. Delice, Medflo, and Lido cultivars grafted on M29C had the highest TCSA growth. The growth rate of the ACSA in Lilly, Lido, and Milord cultivars grafted on M29C was significant. Comparing the cultivars grafted on SJA, the highest TCSA was observed in Farely, Farbali, and Farclo cultivars with the Trident system. The use of the Parallel-U system compared to Trident involved the development of the ACSA, with higher valuesin some studied cultivars.The Trident planting system increased plant canopy volume by about 25.43% compared to Parallel-U.

Key words*: Trident, Parallel-U, Saint Julien A, Myrobalan.*

THE STUDY OF DIFFERENT ROOTSTOCK AND VARIOUS CROWN SHAPES ON SEVERAL VARIETIES OF APRICOTS IN BUCHAREST

Imad Jabbar Wadi IMAD AL SUWAID, Florin STĂNICĂ, Ana Cornelia BUTCARU

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

Corresponding author email: emadjabbar74@yahoo.ro

Abstract

This research was conducted to study 23 apricot varieties (Prunus armeniaca L.) in the experimental field of the Faculty of Horticulture. Myrobalan 29C (M29C), Saint Julien A, and GF677 rootstocks were used for grafting. Two different growth systems of Bi-Baum and Trident were also used. The results showed that Delice, Medflo and Lido cultivars grafted on Myrobalan rootstock had the highest trunk growth. In addition, the growth rate of arm in Lilly, Lido and Milord cultivars grafted on Myrobalan was significant. The graft of Farbali variety on Myrobalan rootstock causes recording the highest trunk section area. In general, it was found that cultivars grafted on Myrobalan Rootstock had higher growth power compared to cultivars grafted on GF677 and Saint Julien A. The use of Bi-Baum system compared to Trident caused the development of the cross-sectional area of the arms (SSB). In the Bi-Baum growth system, the highest amount of SST was observed in Lido cultivar grafted on Myrobalan rootstock. In SJA rootstock, the highest SST was observed in Farely, Farbali and Farclo cultivars with Tribent system.

Key words*: Trident, Bi-Baum, Rootstock, Myrobalan.*

GENETIC VARIABILITY STUDY OF SEVERAL ROMANIAN BLUEBRERRY CULTIVARS USING ISSR MOLCULAR MARKERS

Cosmin Alexandru MIHAI[1], Maria Cristina IONESCU[2], Adrian ASĂNICĂ[1], Dan POPESCU[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, 59 Mărăști Blvd, District 1, Bucharest, Romania

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

Abstract

High-bush blueberry is an important economic and nutraceutical species, due to its high content of anthocyanins and superior antioxidant activities. Recently, climate changes are affecting plant growth and development, leading to changes in plants' adaptation to new environmental conditions. Consequently, the need to create new varieties and hybrids to cope with changes and meet the growing demands of consumers is imperative. One way to hasten plant breeding is to employ molecular methods, such as ISSR. In the present study, five ISSR molecular markers were used to study the genetic relationships between seven Romanian blueberry cultivars and a hybrid. The dendrogram obtained following ISSR analysis revealed the presence of two clusters, one cluster containing 'Lax', 'Prod', 'Vital', 'Azur', and the second 'Simultan', 'Delicia', 'Compact', and the hybrid obtained through free pollination of 'Compact'. The shortest genetic distance was noted between the hybrid genotype and the 'Compact' cultivar. The longest genetic distance was noted between the cultivars 'Compact' and 'Prod'. The study also revealed common markers for the hybrid studied and its maternal genitor, that could be used as markers in blueberry breeding.

Key words*: Vaccinium corymbosum L., microsatellites, blueberry breeding, genetic variation.*

RESEARCH ON RESISTANCE OF SOUR CHERRY CULTIVARS IN DROUGHT CONDITIONS IN THE NORTHEASTERN AREA OF ROMANIA

Elena IUREA, Sorina SÎRBU, Iulia MINEAŢĂ, Iuliana Elena GOLACHE, Mădălina GHERGHEL, Margareta CORNEANU

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

Corresponding author email: sorinas66@yahoo.com

Abstract

This paper presents aspects recorded in the area of influence of the Research Station for Fruit Growing Iasi during 2020-2022 on five Hungarian sour cherry cultivars, able to capitalize on the Romanian agroclimatic conditions. Analysing from a water stress point of view, the April-July time interval when the intensive growth of shoots took place, during the studied years there was a deficit of -54.2 mm in 2020, -11.2 mm in 2021 and -113.8 mm in 2022 compared to the multiannual amount for this period. Analysing the trunk section area in terms of the average of the three years of study, the values were between 10.5 cm^2 ('Erdi Ipari') and 24.9 cm^2 ('Erdi Bibor'). The highest values for the crown volume were recorded in the cultivars 'Erdi Kordi' (4.53 m^3/tree) and 'Dukat' (4.15 m^3/tree) and the lowest crown volume was recorded in the cultivars 'Erdi Bibor' (3.78 m^3/tree), 'Erdi Kedves' (3.27 m^3/tree) and 'Erdi Ipari' (2.20 m^3/tree). The density of the tree crown recorded values between 4.45 cm^2/m^3 ('Erdi Ipari') and 9.28 cm^2/m^3 ('Erdi Bibor').

Key words*: crown volume, deficiency, measurements, precipitation, shoots.*

EARLY VEGETATIVE AND GENERATIVE DEVELOPMENT CHARACTERISTICS OF WILTON`S RED JONAPRINCE® SELECT ECO AND GOLDEN DELICIOUS REINDERS® APPLE CULTIVARS ON B9 AND M9 DWARF ROOTSTOCKS IN IRRIGATED MOLIC EUTRICAMBOSOIL IN NORTHERN TRANSYLVANIA, ROMANIA

Zsolt JAKAB-ILYEFALVI, Larisa-Daniela VLASIN, Anca-Maria CHIOREAN, Smaranda ROŞU-MAREŞ

Fruit Research & Development Station Bistriţa, Drumul Dumitrei Nou, No. 3, Bistriţa, Romania

Corresponding author email: zsolt.jakab@yahoo.com

Abstract

The research revealed important vegetative and generative characteristics of Wilton`s Red Jonaprince Select Eco®/B9 (WRJSE) and Golden delicious Reinders/M9 (GR) combinations in a field trial located at FRDS Bistrita, Romania in early years of orchard development. Results showed stronger vegetative shoot growth in WRJSE / B9 (36.27 cm) in comparison with GR/M9 (26.36 cm), similar trunk cross sectional area growth (5.79 cm^2 in WRJSE and 5.61 cm^2 in GR) and tree height (1.46 m at WRJSE and 1.43 m at GR). Highest generative bud ratio was found at GR (31% from total) versus WRJSE (21%) and highest crop load on GR (3.53 fruit/cm^2) in comparison with WRJSE (1.67 fruit/cm^2). Regarding the number of fruits per tree, results indicated higher values in WRJSE (16 in WRJSE and 8 in GR) respectively the fruit diameter (69.75 mm on WRJSE versus GD 62.05 mm). The orchard being in the first years of development, the obtained yield/tree indicated close values (1.99 kg/tree at WRJSE and 1.95 kg/tree at GD), thus yielding a total production of 2.44-2.49 t/ha at WRJSE and GD.

Key words*: apple, rootstocks, irrigation, yield, vegetative parameters, generative parameters.*

RESEARCH REGARDING INTEGRATED PEST MANAGEMENT STRATEGIES IN SWEET CHERRY ORCHARDS IN SOUTH-EAST ROMANIA

Daniel JALOBA[1], Andrei CHIRILOAIE-PALADE[2], Cristina Maria LUMÎNARE[3], Valentin-Marius CIONTU[3]

[1]Research-Development Institute for Plant Protection,
8 Ion Ionescu de la Brad Blvd, 013813, Bucharest, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest,
59 Mărăști Blvd, District 1, 011464, Bucharest, Romania

Corresponding author email: daniel.jaloba@gmail.com

Abstract

Integrated Pest Management refers to a control system of harmful organisms designed to help farmers fight pests effectively by choosing the most appropriate technological, physical, chemical and biological practices to ensure a high yield, in terms of quantity and quality, and to be friendly to the environment and human health. Consequently, the European Union requires the application of several principles of Integrated Pest Management that fit within sustainable farm management. In sweet cherry orchards the combination of non-chemical methods that may be individually less efficient than pesticides can generate valuable synergies. In Dobroudja region, Constanta County, in sweet cherry orchards, it was successfully managed to integrate appropriate practices that discouraged the development of pests and limited the number of phytosanitary treatments to the minimum necessary level. A high level of yield was obtained to varieties Kordia, Van and Skeena, assessed in 2022.

Key words*: sweet cherry, integrated pest management, harmful organisms, control.*

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

Neli KERANOVA

Agricultural University - Plovdiv, 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.*

EVALUATION OF PEAR AUTOCHTONOUS GENETIC RESOURCES REGARDING BEHAVIOUR TO MAIN DISEASES AND PESTS UNDER FIELD CONDITIONS

Eugenia MARESI (GHERGHINA)[1, 2], Madalina MILITARU[2], Dorel HOZA[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania
[2]Research Institute for Fruit Growing Pitesti, Romania

Corresponding author email: genimaresi@gmail.com

Abstract

In this paper we proposed to evaluate 53 pear genotypes collected in the germplasm collection of the Research Institute for Fruit Growing Pitesti, Romania regarding the behaviour to the main diseases and pests, in order to identify potential genitors for future breeding work. The evaluation was carried out between 2020 and 2022 after a scale from 1 (no symptoms) to 9 (very sensitive). The results obtained showed that there are enough sources of genes for resistance, as follows: `Cu miezul roşu`, `Anţig`, `Harbuzeşti`, `Para lui Niţă`, `Pere gutui`, `Tudor`, `Haydeea`, `Argessis`, `Romcor`, `Cristal`, `Paradise`, `Euras`, `Aniversare` cvs. for resistance/tolerance to fire blight; `Ervina`, `Romcor`, `Para lui Niţă`, `Cristal`, `Tudor`, `Mustoase`, `Paradise`, `Daciana`, `Carpica`, `Republica` cvs. for resistance/tolerance to pear scab;`Paradox`, `Corina`, `Pepenii`, `Haydeea`, `Argessis`, `Untoasă de Târgu Mureş`, `Isadora` – for the resistance/tolerance to Psylla. Some of these cultivars (`Cu miezul roşu`, `Isadora`, `Monica`, `Haydeea`, `Ervina`, `Cristal`, `Euras`, `Paradise`) have already been introduced into artificial hybridization carried out in the last years.

Key words*: breeding, Erwinia amylovora, Psylla sp., Pyrus, resistance, Venturia pyrina.*

PERSPECTIVE GENOTYPES FROM *CHAENOMELES* SP. LINDL FOR FRUIT PRODUCTION

Teodora MIHOVA, Petko MINKOV, Georgi POPSKI, Boryana STEFANOVA, Silvena TODOROVA

Agricultural Academy, Research Institute of Mountain Stockbreeding and Agricultire Troyan, 281 Vasil Levski Str., 5600 Troyan, Bulgaria

Corresponding author email: teodora.mihova@gmail.com

Abstract

Japanese quince (Chaenomeles sp. Lindl) is fruit-medicine plant that is getting attention in the last year in Bulgaria. It has valuable nutritional, dietary and medicinal qualities and deserves to be introduced into culture in Bulgaria. The experiment was conducted in the three-year period (2018-2020) in the collection of RIMSA-Troyan, Bulgaria. The reproductive characteristics of the perspective for fruit production genotypes were studied with an average yield higher than 3.5 kg per plant. They were followed also by fruit weight and biochemical compounds. During the period of the study genotype SCH4 was with the highest average yield (6.88 kg), followed by SCH3 (5.09 kg). The thornless genotype SCH 6 is with the lowest yield (3.71 kg).

Key words*: Chaenomeles sp. Lindl, Japanese quince, phenology, fruits, yield, Bulgaria.*

STUDY OF THE WATER REGIME IN SOME SWEET CHERRY CULTIVARS UNDER NORTH-EAST ROMANIAN CONDITIONS

Iulia MINEAȚĂ[1], Iuliana Elena GOLACHE[1], Sorina SÎRBU[1], Cristina SLABU[2], Ionel PERJU[1], Ștefanica OSTACI[2], Carmenica-Doina JITĂREANU[2]

[1]Research Station for Fruit Growing Iaşi, 3 Ion Voda cel Viteaz Street, 707305, Iaşi, Romania
[2]University of Life Sciences "Ion Ionescu de la Brad" Iaşi, 3 Mihail Sadoveanu Aleey, 700490, Iaşi, Romania

Corresponding author email: iulianagolache@yahoo.com

Abstract

The soil and climate conditions in the North-East area of Romania are considered suitable for sweet cherry cultivation, but sometimes problems may arise due to the intensification of global climate changes, mainly in terms of the water component. This study was conducted during the year 2022 using three sweet cherry tree cultivars as biological material: 'Van', 'Andreiaș' and 'Margonia' from Research Station for Fruit Growing (RSFG) Iași. The aim of this research was to evaluate physiological aspects of the water regime of the sweet cherry tree by determining the rate of dehydration, water content as well as the stomatal conductance of the leaves from different levels of the trees. Physiological determinations were carried out in three different phenological stages according to Biologische Bundesanstalt, Bundessortenamt and CHemical Industry (BBCH) scale: full flowering (BBCH 65), fruit growth (BBCH 75), and fruit ripening (BBCH 89) and were correlated with the registered climate data.

Key words*: dehydration rate, Prunus avium* L.*, stomatal conductance, water content.*

HEIRLOOM VALUABLE LOCAL CULTIVARS THREATENED WITH EXTINCTION IN THE CENTRAL BALKAN MOUNTAIN REGION IN BULGARIA

Petko MINKOV, Teodora MIHOVA, Silvena TODOROVA, Georgi POPSKI, Boryana STEFANOVA

Agricultural Academy, Research Institute of Mountain Stockbreeding and Agriculture Troyan, 281 Vasil Levski Street, 5600 Troyan, Bulgaria

Corresponding author email: petco_m@abv.bg

Abstract

The study was conducted in the towns of Troyan and Apriltsi and the nearby villages and hamlets in the Central Balkan Mountain. During the expedition research, heirloom local apple cultivars and forms threatened with extinction were discovered, marked and described. Their reproductive characteristics were studied. A large genotypic diversity of the genus Malus, L. have been observed. The complex of agroecological conditions favours the growth, and longevity of the apple trees*. Most discovered and described trees are more than 100 years old, more than 15 m tall and more. The trees bear fruit abundantly, but there is a tendency to alternate their fruit bearing. The subject of the present study are 11 late-ripening valuable cultivars with large-size fruit threatened with extinction, such as 'Kandile' - 129.51 g, 'Sadova Perusha' - 108.07 g, etc., with the aim of studying their morphological, pomological and reproductive characteristics. It has been found that most of them are distinguished by an attractive appearance, intensely coloured fruit skin and valuable nutritional and dietary qualities. Their long-term storage under home conditions is also a valuable quality.*

Key words*: apple, gene pool, local cultivars and forms, biometric, physicochemia of fruit.*

THE EFFECT OF CLIMATIC ACCIDENTS ON PEACHES ÎN R.S.F.G. CONSTANȚA

Cristina MOALE, Leinar SEPTAR, Corina GAVĂT, Alexandru OPRIȚĂ, Ion CAPLAN, Gheorghe LĂMUREANU

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

Corresponding author email: moalecristina67@gmail.com

Abstract

In Dobrogea the culture of the peach tree has had great perspectives even from the beginning due to the extremely favorable climate. The peach species loves warm weather and has always found good growing and harvesting conditions in the south-eastern part of Romania. In this period, 7 Romanian and foreign peach tree cultivars were studied at Research Station for Fruit Growing (R.S.F.G.) Constanta: 'Mimi', 'Catherine sel.1', 'Springcrest', 'Raluca', 'Cardinal' 'Filip' and 'Cora'. This paper presents the manner in which certain peach tree cultivars reacted to frost in the springtime of 2020, 2021 and 2022, as well as the effect of the hail on Jun 14th, 2022 on the peach production. The greatest losses caused by the frost were registered in the spring-time of 2020 as far as the fructiferous buds are concerned: 90% at 'Springcrest', 80% at 'Cardinal', 60% at 'Raluca' and 'Filip', 40% at 'Mimi', 'Cora' and 'Catherine sel.1', 20%. The losses caused by the hail on July 14th, 2022 affected the production of the 'Springcrest' cultivar by 80% and of the 'Cardinal' and 'Cora' by 70%. The climatic changes that have been registered throughout the past 10 years have negatively influenced the culture of the peach tree and the effects have been classified according to the cultivar and its biology, as well as to the topographic placement of the allotments. The studies that have been carried out, together with the obtained results demonstrate the importance of choosing the cultivar assortment taking into account the favorability of the area, as well as the importance of installing anti-hail nets when setting up fruit-growing plantations

***Key words**: climate change, cultivar, hail, Prunus persica,*

EVALUATION IN THE ORCHARD OF SOME CULTIVAR-ROOTSTOCK ASSOCIATIONS IN THE CHERRY SPECIES IN THE SECOND YEAR AFTER PLANTING

Andreea MOGA

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

Corresponding author email: andreea.moga24@yahoo.com

Abstract

The cherry is a fruit tree with an economic importance, due to its nutritional proprieties, technological and commercial, in Romania finding good condition for growth and production (Cociu, 1990). The study was conducted at Research Station for Fruit Growing Constanta (RSFG Constanta), in a cherry plot planted in 2020. The objective of the study was to evaluate the orchard, in the climatic conditions of south-east of Romania of some cultivar/rootstock combinations. Ten varieties of cherry tree, created in Romania, or newly introduced in our country were studied and grafted onto two vegetative rootstocks: IPC5 and IPC7. In the two years of the study (2021-2022), observations were made on growth vigor, tree height and number of anticipated shoots for each combination studied cultivar/rootstock. In terms of growth vigor, the highest average trunk diameter was recorded for the Daria/IPC7 30.56 mm. The highest average increases of shoot were noted in the cherry varieties Cociuvas and Daria grafted on the rootstock IPC7, which are 129 cm and 118 cm, respectively.

Key words*: Prunus avium, variety, vigor, height, tree.*

INFLUENCE OF INTERCROPPING ON PHYSICO-CHEMICAL AND BIOLOGICAL SOIL PROPERTIES IN ORGANIC STRAWBERRY CROP

Andrei MOȚ, Mihai FRÎNCU, Ioan VLAD, Elena Ștefania IVAN, Oana-Crina BUJOR, Bogdan MIHALCEA, Maria-Mihaela ZUGRAVU, Liliana Aurelia BĂDULESCU, Roxana CICEOI

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

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

Abstract

The intercropping system promotes biological interactions, increasing plant resources efficiency such as nutrients, water and light use and natural weed, disease, and pest control. The study was carried out in polytunnels using the organic Amandine® strawberry variety in the Baragan plain, in the southeast of Romania. Along the polytunnel`s pole lines, Borago officinalis L. flower strip was seeded. In addition, two cover crops were planted in the spaces between the rows, including microclover and a mixed variety of Gramineae species. For soil sampling were chosen two moments (April and October 2022) and were analysed the following physicochemical and microbiological parameters: pH, electrical conductivity, total soluble salts, total carbon and nitrogen and total number of bacteria and fungi. The results pointed out that the number of bacteria in the soil covered with flower strips increased significantly during the vegetation period for borage strips. In addition, Borage proved to be a companion species that inhibit weeds growth successfully, including in high infestation of Johnsongrass. After the first year, no significant differences regarding the soil physicochemical properties between the sampling periods were noticed.

Key words*: cover crops, intercropping, soil health, strawberries.*

REGENERATIVE AGRICULTURE IN FRUIT STONES AS AN ALTERNATIVE SOLUTIONS FOR RESILIENT ORCHARDS

Valentin Ion PĂUN[1, 2], Dorin Ioan SUMEDREA[2], Florin STĂNICĂ[1], Adrian ASĂNICĂ[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Boulevard, District 1, Bucharest, Romania
[2]National Research & Development Institute for Biotechnology in Horticulture, Bucharest-Pitesti Street, no. 37, Stefanesti - Arges, Romania

Corresponding author email: valentinpaun24@gmail.com

Abstract

Climate change has a global impact on soil health and fertility through influencing the water, carbon and nitrogen cycles. Soils and stone fruit yield are vulnerable to environmental changes such as extreme temperatures draught, heavy rains etc. The present work is focused on identification the proper strategies to regenerate soil, its fertility along with improving fruit health and farm resilience and sustainability. Regenerative Agriculture plays a great role in removing carbon from the atmosphere and store it back in the soil. The aim is to adapt the technology to produce high quality fruits while regenerate the soil. This is related to specific inputs to be use, period, quantities and number of applications. To highlight the differences between classical and regenerative plum grow a lot of parameters has been enclosed for evaluation. Very important are soil parameters and fruit quality indicators. A sap analysis has to be introduced in the overall assessment.

Key words*: plum, soil fertility, biodiversity, sustainable yield.*

THE INFLUENCE OF GROWTH REGULATORS ON THE ACHIEVING OF HIGH PRODUCTIONS FROM THE KORDIA CHERRY VARIETY ON THE MAXMA 14 ROOTSTOCK

Ananie PEŞTEANU, Andrei CUMPĂNICI, Eugeniu GUDUMAC, Andrei LOZAN

Technical University of Moldova, 168, Stefan cel Mare Blvd, Chisinau, MD-2004, Chisinau, Republic of Moldova

Corresponding author email: ananie.pesteanu@h.utm.md

Abstract

The object of the researches were cherry trees of the Kordia variety grafted on the MaxMa 14 rootstock. The research was carried out during 2021. To study the effect of the growth regulators Auxiger (1-naphthylacetamide (1-NAD - 1.5 g/l) and 1-naphthylacetic acid (1-NAA - 0.6 g/l)) and Gibbera, SL (gibberellins, 10 g/l mixture of GA4+7) on the degree of fruit setting, development processes, fruit production and economic production efficiency, the following treatment variants were experimented: 1. Control - no treatment; 2. Auxiger, 0.7 l/ha; 3. Gibbera, SL, 0.25 l/ha; 4. Gibbera, SL, 0.5 l/ha. The growth regulator Auxiger was administered only once, during the period of intensive fruit growth, when their diameter reached 12-13 mm (14.05.2021), and Gibbera, SL in three rounds. The first treatment at the end of the flowering phase (26.04.2021), and subsequent two at an interval of 7-10 days, (05.05.2021) and (14.05.2021), respectively. In the reference period it was established that the degree of fruit binding, development processes, higher fruit productions was recorded when treated with the growth regulator Gibbera, SL in a dose of 0.5 l/ha.

Key words*: cherry, growth regulator, degree of binding, ripening period, production.*

ANTIMICROBIAL ACTIVITY OF *LACTOBACILLUS BREVIS* STRAINS AGAINST FRUIT ROT DISEASES CAUSED BY *RHIZOPUS STOLONIFER* ON STRAWBERRY

Mariana PETKOVA

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

Corresponding author email: marandonova@gmail.com

Abstract

The possibilities of using microorganisms that have a potential antimicrobial effect on controlling phytopathogenic fungi in strawberry production were investigated. Lactic acid bacteria (LAB) of the genus Lactobacillus can be a natural antagonist of pathogenic fungi by releasing lactic acid, acetic acid, ethanol, CO_2, and bacteriocins in the medium. The new eight strains isolated from spontaneously fermented doughs were identified by species-specific PCR as Lactobacillus brevis (L. brevis). Genomic DNA isolated from LAB was used as a template in the PCR reaction to prove the presence of genes encoding bacteriocins. The antimicrobial activity of different strains on the development of phytopathogenic fungi Rhizopus stolonifer was studied in vitro and in vivo experiments. When cell-free supernatant of L. brevis G2 was applied, suppression of the development of Rhizopus stolonifer in vitro has been observed. The activity of L. brevis strain G2 for inhibition of phytopathogen in vivo was investigated using artificially damaged fruit. L. brevis G2 showed the best suppression of Rhizopus stolonifer, suggesting its potential use as a biocontrol agent in strawberry production.

Key words*: Lactobacillus brevis, strawberry, antifungal activity, Rhizopus stolonifer.*

QUALITY ASSESMENT OF ORGANIC `PLAPINK` RASPBERRY FRUITS UNDER DIFFERENT STORAGE CONDITIONS

Andrei PETRE[1], Mihai FRÎNCU[1], Andreea BARBU (STAN)[1], Andrei LESNIC[1], Liliana BĂDULESCU[1, 2], Adrian Constantin ASĂNICĂ[2]

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

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

Abstract

Raspberry (Rubus idaeus L.) is one of the most appreciated fruits in the world. According to FAO, the annual production in 2021 was about 886.000 t, with Europe having the largest input (approximately 68%). Due to the perishable nature of the fruits, there is a continuous need for improving the storage condition. The aim of the paper is to present the influence of storage conditions on organic raspberry fruits. Raspberries from `Plapink` cultivar, were harvested in 2021 and stored in three different conditions: 1) normal atmosphere (NA) with 1˚C and 85% relative humidity (RH); 2) controlled atmosphere (CA) conditions with 1˚C, 85% RH, 15% O_2 and 5% CO_2, and 3) CA conditions with 1˚C, 85% RH, 5% O_2, and 15% CO_2 for 3 days followed by NA for 6 days. Several quality indicators and physiological parameters were assed in order to verify the variations during the storage period. The total phenolic content values in NA decreased with about 6.28% compared to the initial moment, but no decreases were recorded during 3 days of storage in CA.

Key words*: raspberry, quality indicators, controlled atmosphere, bioactive compounds.*

EVALUATION OF BIOACTIVE COMPOUNDS WITH ANTIOXIDANT ACTIVITY OF *HELICHRYSUM ARENARIUM* (L.) MOENCH INFLORESCENCES EXTRACTS

Gabriela POPA, Silvana DĂNĂILĂ-GUIDEA, Ecaterina DAMIAN, Gabriela MĂRGĂRIT, Diana GROPOȘILĂ-CONSTANTINESCU

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

Corresponding author email: popagabiro@yahoo.com

Abstract

The aim of this study was to evaluate the bioactive compounds with antioxidant activity in aqueous, 70% ethanolic and 80% methanolic extracts of Helichrysum arenarium inflorescences. Phytochemical screening was performed on the three extracts to detect the presence of secondary metabolites such as alkaloids, flavonoids, phenolic compounds, glycosides, phytosterols and tannins. The total flavonoid content was determined by aluminium chloride colorimetric assay at 420 nm. Total phenol content was determined with Folin-Ciocalteu reagent at 765 nm. Antioxidant activity was determined using the 2,2-diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging method and the total antioxidant capacity (TAC) assay. The results showed that among the three samples studied, the 70% ethanol extracts had the highest polyphenol and flavonoid values. Also, the antioxidant activity of the 70% ethanol extract was higher than that of the aqueous and 80% methanol extracts. The high content of phenols and flavonoids indicated that these compounds contribute to the antioxidant activity of Helichrysum arenarium. Phytochemical examination revealed the presence of alkaloids, flavonoids, phenols, glycosides, phytosterols and tannins in all extracts.

Key words*: Helichrysum arenarium, phenols, flavonoid, phytochemical screening, antioxidant activity.*

CONTENT OF BIOACTIVE COMPOUNDS AND ANTIOXIDANT ACTIVITY IN CHOKEBERRIES JUICE (*ARONIA MELANOCARPA*)

Gabriela POPA[1], Damian DRAGOMIR[2], Mihaela DOGARU[2], Aurora DOBRIN[3]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, 011464 Bucharest, Romania
[2]Research-Development Station for Fruit Growing Baneasa, 4 Ion Ionescu de la Brad Blvd, District 1, 013813, Bucharest, Romania
[3]University of Agronomic Sciences and Veterinary Medicine of Bucharest, Research Center for Studies of Food Quality and Agricultural Products, 59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: popagabiro@yahoo.com

Abstract

Aronia fruits (Aronia melanocarpa) are very rarely used in the Romanian diet, although they have the highest antioxidant properties of all fruits. Therefore, the objectives of this study were to evaluate the bioactive compounds and antioxidant activity of fresh aronia juice and dried fruit residues. The antioxidant activity of the samples was determined by DPPH assay. Total antioxidant capacity was evaluated by the phosphomolybdate method. The content of polyphenols, flavonoids and anthocyanins in the aronia samples was also investigated. The results showed that fresh aronia juice contains the highest levels of phenols, flavonoids and antioxidant activity. A high level of anthocyanins was found especially in the dried fruit residues. These results demonstrate the potential of Aronia melanocarpa as a healthy and nutritionally rich dietary food with many functionalities and benefits.

Key words*: Aronia melanocarpa, phenols, flavonoids, anthocyanins, antioxidant activity.*

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

PHENOLOGICAL CALENDAR OF PLUM CULTIVARS, DEPENDING ON THE CHANGES OF CLIMATIC CONDITIONS FOR THE TROYAN REGION, BULGARIA

Georgi POPSKI, Boryana STEFANOVA, Petko MINKOV, Teodora MIHOVA, Silvena TODOROVA

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

Corresponding author email: g.popski@abv.bg

Abstract

The purpose of this paper was to analyze the influence of climatic factors and their impact on the phenology of some plum varieties grown in RIMSA Troyan during the period 2019-2021. The phenophases of the beginning of flowering, the end of flowering and the period of fruit ripening were observed and analyzed. Regarding the flowering phenophase, it was found that earliest blossoming of plum cultivars occurred at the beginning of April in 2019. The blossoming period for 'Kyustendilska' both began and ended at the latest time. Every year, within 10-11 days, there was a complete overlap of the blossoming of all the studied cultivars.
Regarding the fruit ripening, higher temperatures combined with low amounts of precipitation, cause an earlier onset of the ripening phase.

Key words*: plum, cultivars, phenology, climate change.*

INCREASING THE EFFICIENCY OF PLUM BREEDING IN FAMILY ORCHARDS BY INTRODUCING INTO THE VARIETAL ASSORTMENT OF SOME UNIVERSAL VARIETIES WITH VALUABLE PHYSICOCHEMICAL PROPERTIES

Daniela Nicoleta SCEDEI, Olimpia Alina IORDĂNESCU, Alina Georgeta DOBREI, Anişoara Claudia DUMA-COPCEA, Casiana MIHUŢ, Simion ALDA, Eleonora NISTOR, Alin DOBREI

University of Life Sciences "King Mihai I" from Timişoara,
119 Aradului Street, 300645, Timișoara, Romania

Corresponding authors emails: alin1969tmro@yahoo.com;
nisnora@yahoo.com

Abstract

The research was carried out in an orchard from Cenad village, Timis County, throughout 2021, and compared five recently introduced varieties (Topend Plus®, Topfive®, TopHit , Toptaste®, Amers) with a control variety (President). Some physical and chemical characteristics of the fruits (major diameter, minor diameter, length, weight, total soluble solids, carbohydrate content, pH, and vitamin C) as well as plum production were monitored and measured. The plum components and economic indicators differ significantly between the varieties evaluated. In the majority of the examined indicators, all five newly introduced varieties outperformed the control, indicating the necessity to change the plum varietal assortment not only to satisfy market demands, but also to meet the suitability for industrialization and obtaining jams, juices or compotes, an important criterion given the net downward trend in demand for alcoholic products derived from plums. Economic indicators must be considered for fruit breeding success, particularly in light of current market trends caused by increases in labor costs, fertilizers or pesticides.

Key words*: plum trees, varieties, weight, firmness, yield, assortment, orchards.*

APRICOT RESPONSE TO RADICULAR AND FOLIAR APPLICATION OF FERTILIZERS UNDER DOBROGEA CONDITIONS

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

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

Corresponding author email: septarleinar71@gmail.com

Abstract

Drought and heat stress are significant factors limiting fruit crop yield in arid conditions. Foliar fertilization is a common practice of supplying fruit crop production with mineral nutrients, especially under limited soil nutrient availability conditions. Nutrient management is a determining element of the technology in fruit quality. In this study we aimed to evaluate the impact of a the radicular (NPK+S) and foliar (Cropmax) fertilizer on fruit quality parameters in an apricot orchard during 2019 -2021 period. According to our results, the weight of the fruits increased by 30% in the b1 treatment (radicular fertilizer with NPK+S) and 34% in the b2 treatment (radicular and foliar fertilizer with Cropmax) at Olimp cultivar and by 40% in the b1 treatment and 53% in the b2 treatment at Goldrich cultivar in the three years of study compared to the control treatment. In conclusion, the fruit quality can be improved in apricot orchard using of the radicular and foliar fertilizer.

Key words*: climate conditions, fertilization, fruit size, Prunus armeniaca, weight.*

PAWPAW FRUIT (*ASIMINA TRILOBA* (L.) DUNAL). PROCESSING AND NUTRACEUTICAL VALUE

Elena Gabriela STAN[1], Lavinia Mihaela ILIESCU[2], Florin STĂNICĂ[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: iliescu_lavinia@yahoo.com

Abstract

Asimina triloba (L.) Dunal, or pawpaw, is the only temperate plant species that belongs to the Annonaceae family. Is a native North American fruit species from Florida to South Canada. In Romania, the first pawpaw plants were brought in Transylvania from North America at the beginning of the 20th Century, in 1926 by Suciu family from Alba. They were locally cultivated and remained unknown in the rest of country. Only after 2000, have begun to be studied at the Faculty of Horticulture, in Bucharest. Regarding nutritional value, asimina is comparable to apple, banana, orange, peach and grape since it are high nutritionally rich fruit with high levels of minerals, vitamins and antioxidant compounds. The color of the fruit changes from white-cream at bright yellow to shades of orange. The flavor of ripe pawpaw fruit resembles a combination of banana, mango and pineapple. Pawpaw fruit are best eaten fresh when fully ripe but the intense tropical flavor may be useful for preparation of food products such as: ice cream, smoothie, candy, juices, cakes and others.

Key words*: ice cream, minerals, northen banana, products, vitamins.*

INFLUENCE OF CLIMATIC FACTORS ON THE PHENOLOGICAL AND REPRODUCTIVE MANIFESTATIONS OF INTRODUCED APPLE CULTIVARS IN THE REGION OF TROYAN, BULGARIA

Boryana STEFANOVA, Georgi POPSKI, Petko MINKOV, Teodora MIHOVA

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

Corresponding author email: stefanova_b@abv.bg

Abstract

The main phenological and biological features of the introduced apple cultivars were studied, for the period 2019-2021 in the region of Troyan.
In order to establish their influence on the phenological manifestations of apple cultivars in order to be able to recommend them for cultivation from a practical point of view. It was found that in 2021 flowering was abundant and occurred 5-8 days later than the previous year. The latest date for the end of flowering was registered for the 'Reanda' cultivar on May 12. The period from the beginning of flowering to its end is about 15-17 days. The fruits of the observed apple cultivars ripened in the period from mid-September to the first 10 days of October. The fruits of 'Remo' and 'Revena' reached the earliest stage of ripening, and 'Granny Smith' was the latest.

Key words*: Troyan region, climatic conditions, apple, cultivar, phenology.*

PRELIMINARY RESEARCH ON *IN VITRO* PROPAGATION OF *ZIZIPHUS JUJUBA* MILL.

Ana-Maria STOENESCU[1, 2], Sina Niculina COSMULESCU[3], Nicolae GHEORGHIU[3]

[1]University of Craiova, Horticulture Faculty, Department of Biology and Environmental Engineering, 13 A.I. Cuza Street, Craiova, Romania
[2]University of Craiova, Doctoral School of Plant and Animal Resources Engineering (Postdoctoral Researcher), 13 A.I. Cuza Street, Craiova, Romania
[3]University of Craiova, Horticulture Faculty, Department of Horticulture & Food Science, 13 A.I. Cuza Street, Craiova, Romania

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

Abstract

In the present study, shoots of Ziziphus jujuba Mill. cv. 'Huping Zao' were used to identify an in vitro propagation protocol. Murashige and Skoog medium was used for this purpose. In the initiation and establishment stage, the best variant in terms of explant growth proved to be the one to which 2 mg L^{-1} IBA + 0.1 mg L^{-1} GA_3 + 1.5 mg L^{-1} NAA were added. Regarding the explant multiplication stage, the best results were obtained using 2 mg L^{-1} IBA, respectively 2 mg L^{-1} IBA + 0.5 mg L^{-1} NAA. The obtained results confirm the role and importance of different concentrations of hormones on the growth and development of explants.

Key words*: in vitro, jujube, tissue culture, shoots.*

PRELIMINARY RESULTS REGARDING YIELD AND FRUIT QUALITY OF SOME APPLE CULTIVARS IN ECOLOGICAL SYSTEM

Viorel STOICA, Dorel HOZA

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

Abstract

The aim of this study was to assess the yield and fruits quality of apple produced in ecological system. In 2022 the influence of different fertilizers on yield and fruits quality at three apple cultivars was carried out. The trees were planted in a spacing of 3 x 2 m, according to the following experimental scheme: Factor A - cultivar, with three graduation (a1 - 'Romus 3', a2 - 'Idared' and a3 - 'Golden delicious'); Factor B - fertilization variant, with four graduations (b1 - Biohumus - 0.5 L/tree, soil application + Macys BC 28 - 2 L/ha, foliar application + Cifamin BK - 1 L/ha, foliar application; b2 - Biohumus - 0.7 L/tree, soil application + Macys BC 28 - 2 L/ha, foliar application + Cifamin BK - 1 L/ha, foliar application; b3 - Biohumus - 0.9 L/tree, soil application + Macys BC 28 - 2 L/ha, foliar application + Cifamin BK - 1 L/ha, foliar application; b4 - 'Unfertilized'). As results of the investigations we found that the highest fruit yield and fruits quality was obtained at 'Idared' (28.66 kg/tree, respectively 215.66 g) cultivar in fertilization variant 3.

Key words*: apple, cultivar, fertilizers, yield, fruits quality.*

ECOLOGICAL APPLE CULTURE IN ROMANIA - CULTIVATION AND CULTIVARS

Viorel STOICA, Dorel HOZA

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

Abstract

In the last decade, European consumer demand for organic or ecological products has increased. Ecological agriculture has the potential to reduce negative impacts on humans and ecosystems, but its productivity compared to conventional agriculture remains a controversial issue. Consumers began to look for safer and better controlled fruits, produced in a more ecological environment. Organically produced fruits are considered to satisfy consumer demands while having a favorable impact on the environment and human health. European Union guidelines on organic production prohibit the use of synthetic products (fertilizers and plant protection methods). The principles for organic farming are similar in different European countries and the permitted inputs are regulated by law. In this paper, we proposed to present principles and rules in ecological fruit growing sector, as well as fertilizers and varieties recommended for apple culture in an ecolog-cal system in Romania.

Key words*: apple, ecological system, rules, cultivars, fertilizers.*

INFLUENCE OF PHOTOSELECTIVE PROTECTIVE NETS ON THE SENSORY CHARACTERISTICS OF FRUITS OF THE PINOVA APPLE CULTIVAR

Sava TABAKOV[1], Petya IVANOVA[2], Galya DOBREVSKA[1], Manol DALLEV[1], Anton YORDANOV[1]

[1]Agriculture University - Plovdiv, 12 Mendeleev Blvd, Plovdiv, Bulgaria
[2]Institute of Food Preservation and Quality - Plovdiv,
154 V. Aprilov Blvd, Plovdiv, Bulgaria

Corresponding author email: manol_dallev@abv.bg

Abstract

Changing the light regime during the growing season by using photoselective nets in devices protecting against hail can have an impact on the yield and its quality. The white and black nets used do not change the spectral composition of the light passing through the grids, but act as shades, reducing the amount of light that passes through the grids. The influence of this effect on the sensory characteristics of Pinova apple fruits was investigated in an orchard with a support structure with an anti-hail net located in Northern Bulgaria. The sensory evaluation of the Pinova cultivar shows that the fruits under the most commonly used black net in orchards do not differ significantly in taste, aroma, and consistency from those grown under white, yellow, and red coverings. Only the influence of different types of nets on the appearance of the fruits of the Pinova apple cultivar has been statistically proven.

Key words*: Pinova, photoselective net, sensory analysis, appearance, color, taste and aroma.*

INFLUENCE OF PHOTOSELECTIVE PROTECTIVE NETS ON THE SENSORY CHARACTERISTICS OF FRUITS OF THE FLORINA APPLE CULTIVAR

Sava TABAKOV[1], Petya IVANOVA[2], Galya DOBREVSKA[1], Anton YORDANOV[1], Manol DALLEV[1]

[1]Agriculture University - Plovdiv, 12 Mendeleev Blvd, Plovdiv, Bulgaria
[2]Institute of Food Preservation and Quality - Plovdiv,
154 V. Aprilov Blvd, Plovdiv, Bulgaria

Corresponding author email: manol_dallev@abv.bg

Abstract

Changing the light regime during the growing season by using photoselective nets in devices protecting against hail can have an impact on the yield and its quality. The white and black used nets do not change the spectral composition of the light passing through the grids, but act as shades, reducing the amount of light that passes through the grids. The influence of this effect on the sensory characteristics of Florina apple fruits was studied in an orchard with a support structure located in Northern Bulgaria.
The sensory evaluation of the Florina cultivar shows that the fruits under the most commonly used black net in orchards in terms of taste, aroma and consistency do not differ significantly from those grown under yellow and red coverings. Only the influence of different types of nets on the appearance and skin colour of the fruits of the Florina apple variety has been statistically proven.

Key words*: Florina, photoselective nets, sensory analysis, appearance, colour, taste, aroma.*

CONTRIBUTION TO THE KNOWLEDGE OF THE *AUCHENORRHYNCHA* FAUNA ASSOCIATED WITH APPLE AND PLUM ORCHARDS IN THE SOUTHERN PART OF ROMANIA IN 2022

Andrei TEODORU[1, 2], Constantina CHIRECEANU[2], Ion MITREA[1]

[1]Doctoral School of Plant and Animal Resources Engineering, Faculty of Horticulture, University of Craiova, 13 A.I. Cuza Street, Craiova, Romania
[2]Research and Development Institute for Plant Protection Bucharest, 8 Ion Ionescu de la Brad Blvd, Bucharest, Romania

Corresponding author email: andrei_theodor44@yahoo.com

Abstract

The suborder Auchenorrhyncha is a diverse group of sap-feeding insect species, many of them of economic importance. The paper presents comparative results on the ecological characteristics of species communities of Auchenorrhyncha sampled in one apple orchard and one plum orchard that belong to the experimental field Moara Domnească Didactic Station in the year 2022. The insects were collected using dual-sided yellow sticky traps. A number of 9 traps/orchard was used from early April till mid-November (234 traps in total), replaced every two weeks. Altogether, 34 species have been identified, 30 in apple orchard and 32 in plum orchard, totaling 7403 specimens, 6058 (81.8%) in the apple orchard and 1345 (18.2%) in the plum orchard. The most abundant species found in the apple orchard was Empoasca decipiens with 3614 specimens (59.66%), with a constancy of 64.1%. In the plum orchard, two species were the most numerous, Fieberiella florii with 411 specimens (30.6%) and Zygina flammigera with 304 specimens (22.6%), having a constancy in the samples of 24.8 and 29.9% respectively. Adult populations dynamics were performed for relevant species in both orchards.

Key words*: apple and plum orchards, invasive insects, leafhoppers, planthoppers.*

BREEDING OF KIWIFRUIT SPECIES (*ACTINIDIA* SP.) - A REVIEW

Larisa Theodora TILINCĂ, Florin STĂNICĂ

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

Corresponding author email: tilinca_larisa@yahoo.com

Abstract

The origin of kiwi plant is located mainly in Yangtze valley, northeastern China. At the beginning of XXth century, seeds brought from China have been used by a nursery man from New Zealand, to obtain the first hybrids plants and respectively, selected varieties. Later on, together with the extension of kiwifruit crop on several continents, breeding works started in the other countries. New Zealand remained at the forefront of breeding activity and, at the 90's released the first yellow flesh kiwi Hort 16A - Zespri Gold. Other cultivars were obtained in Italy, USA, China, etc. In countries with a colder climate, kiwiberry (A. arguta) has become popular and breeding programs were carried out in New Zealand, Italy, China, Poland, Belgium, and Romania. In addition to public breeding programs, many private ones are active. The review presents the main kiwi breeding achievements.

Key words*: cultivars, yellow flesh, crossings, kiwiberry.*

THE PERFORMANCE OF THE PERSIMMON GROWN IN THE SOUTHERN OF ROMANIA

Irina TITIRICĂ[1], Florentina NETCU[1], Cristina BÎRSOGHE[1], Ioana A. ROMAN[2]

[1]Dăbuleni Research-Development Station for Plant Cultivation on Sandy Soil, Romania, 217 Petre Baniță, Dăbuleni, Romania
[2]University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Department of Transversal Competences, 3-5 Manastur Street, 400372, Cluj-Napoca, Romania

Corresponding author email: titiricairina@gmail.com

Abstract

In Romania until now, are no commercial persimmon (Diospyros kaki Thunb) orchards. But, the interest for the fruits of this species is increse. Solitary trees of Diospyros virginiana being found in parks and private gardens it have fruits are very astringent, without interest for consuummers, but they offer a very atractive wiew in lands to the starting of the winter season. In the South of Romania, during the winter, are occasional registered temperatures of -20-25°C which cane affects the varieties from Diospyros kaki. For this reason, in 2019 year, we established an experimental plot with two cultivars Rosseyanka and Jiro, to study the persimmon culture suitability in Romania. The study carried out so far, shows that the Rosseyanka cultivar, reached a high fruits yield of 11 kg/tree, in the fourth year after planting. From the point of view of fruit quality, the Jiro variety recorded a value of fruit weight of 162.2g/fruit and 85.36 mg% vitamin C fruits contents.

Key words*: yield, fruit quality, biometrics indices.*

REPRODUCTIVE CHARACTERISTICS OF PLUM CULTIVARS - A SELECTION OF THE EXPERIMENTAL FRUIT GROWING STATION OF DRYANOVO

Silvena TODOROVA, Petko MINKOV, Teodora MIHOVA, Nikolina MARINOVA, Galina NAYDENOVA

Research Institute of Mountain Stockbreeding and Agriculture,
281 Vasil Levski Str., 5600, Troyan, Dryanovo, Bulgaria

Corresponding author email: silvena_koleva@mail.bg

Abstract

During the period 2019-2021, a study was conducted on the reproductive characteristics of four plum cultivars, a selection of the Experimental Station of Dryanovo: Balvanska Slava, Gabrovska, Nevena and Strinava. The Stanley cultivar was the control. The observations were conducted in the experimental plantations of RIMSA, in the area of Dryanovo. The plum trees were in a period of full fruit bearing, during which the yield (kg/tree) was reported. The following measurements were taken on fresh fruit: fruit weight (g) and stone weight (g); fruit size – height, width and thickness (mm); biochemical analysis of fresh fruits. Balvanska Slava distinguished with the largest fruits - 39.71 g (2021). The fruit weight, for the rest of the cultivars, was in the interval from 21 to 35 g. For Gabrovska, Nevena and Strinava, the average yields were 23 kg/tree. In 2021, higher dry matter values were measured in all cultivars compared to previous years. There was a good ration between sugars and acids in Gabrovska, Nevena and Stanley, which makes them suitable for drying and processing.

Key words*: cultivars, yield, biometrics, chemical analysis.*

STUDY OF THE NEW CLONAL CHERRY ROOTSTOCK HYBRIDS 20-192 AND 20-181 IN NURSERY

Dimitar VASILEV[1], Svetoslav MALCHEV[2], Lilyana NACHEVA[2]

[1]Konstantin Preslavsky University of Shumen, 115 Universitetska Street, Shumen 9700, Bulgaria
[2]Fruit Growing Institute - Plovdiv, Agricultural Academy, 12 Ostromila Street, 4004 Plovdiv, Bulgaria

Corresponding author email: d.v.dimitrov@shu.bg

Abstract

Studies have been conducted in the fruit tree nursery of Agricultural Experiment Station - Khan Krum between 2013 and 2016. Research subjects were the selected cherry rootstock hybrids 20-181 and 20-192 as clonal rootstocks grafted with cultivars Kossara, Trakiiska hrushtyalka and Van. Prunus mahaleb seedlings were used as a reference. The aim of the study was to investigate the growth characteristics, quality of planting material, and compatibility of the rootstocks with commercial cultivars. The average success rate of grafting reported in the autumn of the analyzed cultivar-rootstock combinations varied as follows: P. mahaleb (89 - 92%), hybrid 20-192 (85-89%), and hybrid 20-181 (81-86%). The clonal rootstock 20-192 induces relatively weaker growth than the Mahaleb. The weakest growth characterizes hybrid 20-181. Both tested rootstock hybrids, obtained by the crossing of 'Polevka'×'Compact Van', produce planting material with standard trunk diameter and tree height.

***Key words**: sweet cherry, Prunus mahaleb, rootstocks, cultivars, hybrids*.

IDENTIFICATION OF GENETIC DIVERSITY AMONG SOME PEARS CULTIVARS WITH ISSR MARKERS

GIANCARLA VELICEVICI[1], Emilian MADOŞĂ[1], Sorin CIULCĂ[1], Adriana CIULCĂ[1], Dorin CAMEN[1], Carmen BEINŞAN[1], Mihaela MĂLĂESCU[1], Ilinca IMBREA[1], Iuliana CRETESCU[2]

[1]University of Life Science "King Mihai I" from Timisoara,
119 Calea Aradului Street, Timisoara, Romania
[2]University of Medicine and Pharmacy "Victor Babes",
2 Eftimie Murgu Sq., Timisoara, Romania

Corresponding author email: giancarlavely2000@yahoo.com

Abstract

This study identified genetic diversity in pear cultivars using ISSR techniques. In breeding programs, molecular markers play an important role. Molecular markers are the most efficient tools for the study of taxonomy, genetic variability, phylogenetic analysis, gene tags, gene localization and development of new cultivars. ISSR techniques were used in the identification of the genetic diversity of 10 pear cultivars. Five out of the used primers in this study amplified clear and reproductible bands. The ISSR primers produced 51 bands, and 45 of them were polymorphic, with an average of 10.2 amplicons/primer. The size of the fragments varied from 200 to 1250 bp. The polymorphic bands, registered per primer ranged from 6 (844) to 11 (primer UBC 830). The percentage polymorphism was between 83.33 for UBC808 and 100% for primer 844. Degree of DNA polymorphism was estimated at 89.54% (ISSR). PIC registered values between 0.34 to 844 and 0.75 for UBC814. The primer 844 presented values of discrimination index (PI)2.06. The obtained results will be useful to serve plant breeding programs.

Key words*: genetic analysis, ISSR markers, pear.*

EFFECTS OF DIFFERENT SUPPLEMENTAL LIGHTING DIRECTIONS AND INTENSITIES ON LEAF PHOTOSYNTHETIC CHARACTERISTICS AND FRUIT YIELD OF STRAWBERRY (FRAGARIA×ANANASSA)

Fang WANG, Qiuhong LIAO, Qingming LI, Qichang YANG

Institute of Urban Agriculture, Chinese Academy of Agricultural Sciences, B1-2, D block of Tianfujingrong, 99 Hupan West Road, Tianfu New Area, Chengdu, People's Republic of China

Corresponding author email: yangqichang@caas.cn

Abstract

Strawberry fruit is loved by consumers for providing a wide range of sensory stimulation and health benefits. Seasonal low light intensity and short photoperiod in winter lead to decreased fruit yield and quality. Here, we demonstrated changes in leaf photosynthetic characteristics and fruit yield of strawberry under different supplemental lighting orientations and intensities. The plant morphology, fruit yield and quality are closely related to the adaptation of plant to light orientations and intensity. Compared with the un-treatment control, supplementary lighting significantly improved leaf photosynthetic characteristics, single fruit weight and total yield, as well as soluble sugar, protein and solids contents. Besides, there was no significant difference between the treatments with medium-intensity supplemental upward lighting and high-intensity supplemental downward lighting. However, photoinhibition caused by the high intensity of supplemental upward lighting significantly reduced the fruit yield. Hence, supplemental upward lighting can generate greater economic benefits in a way that consumes less energy. This study provides a theoretical basis for utilizing the photosynthesis potential of the abaxial leaf and improving unit leaf productivity to promote fruit yield and quality of strawberry.

Key words*: strawberry, supplemental downward/upward lighting, leaf photosynthetic characteristics, fruit yield, fruit quality.*

EVALUATION OF OLD APPLE VARIETIES GROWN IN NORTH-EASTERN PART OF ROMANIA

Cristina ZLATI, Mihai ISTRATE, Marius DASCĂLU, Roxana PAȘCU, Roberto BERNARDIS, Eduard STRUGARIU-EISENHAUER

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

Corresponding author email: zlaticris76@yahoo.com

Abstract

Old apple cultivars, either originating from Romania or of foreign origin but grown widely in this region, were examined to provide a characterisation of the varieties. The aim of the thesis was to observe and evaluate the phenological, and morphological traits of the old apple cultivars using the following methods as: observation of flowering phenology traits and the classification of the cultivars into flowering time groups; characterisation of the gene bank collection and the determination of diversity using morphological markers; preparation of a number-coded characterisation based on the morphological and biological traits laid down in the UPOV guidelines. Identified and colected material provides the initial genetic sourse for variety improvment. Using the observations and determinations made, we identified the potential genitors for different useful characteristics that we used in controlled intra and interspecific hybridizing. Researcers constant concern refers to preserving, copleting, periodicaly reorganizing and assesing the biological and agrochemical characteristics of each genotype, the exchange of biological material into the restricted manner and the assesment of the potential genitors for some useful characteristics used in genetic breeding programs.

Key words*: Malus, varieties, evaluation, diversity.*

VITICULTURE AND OENOLOGY

THE INFLUENCE OF MACERATION TECHNIQUES ON THE POLYPHENOLIC CONTENT OF THE WINES FROM NEGRU AROMAT GRAPE VARIETY

Irina-Georgiana BĂLĂNESCU[1], Arina Oana ANTOCE[2], Liliana PÎRCĂLABU[1], Georgeta TUDOR[1], Steliana-Paula BARBU[1]

[1]Research and Development Institute for Viticulture and Enology Valea Călugărească, Valea Mantei Street, no.1, Valea Călugărească, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, 010464 Bucharest, Romania

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

Abstract

The aim of the present study was to establish the influence of maceration techniques on the polyphenol and aroma compounds of wines obtained from 'Negru aromat' grapes, a variety created at the Research and Development Institute for Viticulture and Enology Valea Calugareasca, Romania. Three maceration techniques were applied as follows: submerged cap, pump-over (must recirculation) and delestage (several rack and return processes). Wines were evaluated and compared by chemical and sensory analyses, in order to determine which one is most suitable for this grape variety and can lead to well-balanced wines. With higher amounts of anthocyanins (377 mg/L), total polyphenols (3478 mg/L) and a more intense aroma of fresh fruits (cherries, bitter cherries, black currants, grapefruit), the wines obtained through pump-over technique applied during the phase of maceration-fermentation were identified as being of optimal quality. Thus, must pump-over is recommended for the production of 'Negru aromat' wines, but more studies are warranted to optimize the winemaking process.

Key words*: 'Negru aromat', wine, polyphenols, anthocyanins, maceration-fermentation techniques*

FERMENTATION TEMPERATURE AND DURATION EFFECT ON THE QUALITY AND ANTHOCYANIN CONTENT OF KADARKA WINE PRODUCED IN THE MINIŞ (MÉNES) WINE REGION

Géza BALLA, Tekla Amália LUNKA, József JOÓ, Csaba MOLDOVÁN, Zsolt SZEKELY-VARGA, Barna PUTNOKY-CSICSÓ, Endre KENTELKY

Sapientia Hungarian University of Transylvania, 2 Calea Sighişoarei, Târgu-Mureş, Romania

Corresponding author emails: tekla.lunka@gmail.com
kentelky@ms.sapientia.ro

Abstract

Grape growing and winemaking has a very long history around the world, where the geographical conditions and the climate is favourable. Romania could be listed between these regions, where can be found numerous red and white wine regions. Miniş region is famous for one of its red wines made from a traditional variety named Kadarka. Aim of the present experiment was to examine the quantitative and qualitative parameters of the wine made from Kadarka during the application of skin fermentation red wine, and to knowledge how these parameters change with the different fermentation temperature and duration and also measuring the anthocyanin content of the wine. Examining the quantitative and qualitative parameters the length and the temperature of the fermentation did not change significantly. On the other hand, the anthocyanin level accomplished better results with a lower fermentation period, a higher temperature with 380 mg/L after 12 days of fermentation at 28°C. Observing the results of the sensory evaluation of Kadarka, the wine fermented for a shorter period of time and at a lower temperature reached the greatest results.

Key words*: fermentation, Kadarka, Miniş, wine.*

EFFECT OF THE FERMENTATION TEMPERATURE AND DURATION ON THE ANTHOCYANIN AND QUALITY CONTENT OF CABERNET SAUVIGNON WINE PRODUCED IN THE MINIŞ (MÉNES) WINE REGION

Géza BALLA, Tekla Amália LUNKA, József JOÓ, Csaba MOLDOVÁN, Zsolt SZEKELY-VARGA, Artúr-Botond CSORBA, Endre KENTELKY

Sapientia Hungarian University of Transylvania, 2 Calea Sighişoarei, Târgu-Mureş, Romania

Corresponding author emails: tekla.lunka@gmail.com
kentelky@ms.sapientia.ro

Abstract

Romania has a good geographical location and favourable climate and soil properties for grape growing. The main reason for this is the high anthocyanin content in red wine which acts as an antioxidant. The goal of our experiment was to examine the effect of changes in fermentation temperature and duration of fermentation on the anthocyanin content and quality of the resulting varietal wines. Also, to improve the quality of one of the main red wine varieties of the Miniş wine region, Cabernet Sauvignon during the fermentation process. The laboratory tests showed that none of the parameters were affected by the fermentation temperature or the duration of the fermentation. In terms of anthocyanin content better results were obtained with longer fermentation period and higher fermentation temperature. Cabernet Sauvignon had an anthocyanin content of 485 mg/L after 15 days of fermentation at 30°C. During the sensory evaluation it can be stated that the wine fermented for a longer period of time and at a higher temperature proved to get higher score.

Key words*: Cabernet Sauvignon, fermentation, Miniş, wine.*

MECHANISMS AND FACTORS INFLUENCING MCFA FORMATION BY YEASTS DURING GROWTH AND ALCOHOLIC FERMENTATION AND THEIR IMPORTANCE IN WINEMAKING

Cornel Daniel BANIȚĂ[1], Arina Oana ANTOCE[2], George Adrian COJOCARU[2]

[1]Pietroasa - Istrita Research and Development Center for Viticulture and Pomiculture, Staţiunii Str., 127470, Pietroasele - Buzău, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author emails: aantoce@yahoo.com; cojocaru.george@ymail.com

Abstract

The medium chain saturated fatty acids (MCFA) are synthesized by the yeasts and released in fermentation media, where they contribute to fermentation aroma, but are also well known for their inhibitory effect on yeast growth. At low pH and in the presence of ethanol, only few mg/l of MCFA could arrest the AF. One of the mechanisms employed by the yeasts to protect themselves from the MCFA effects implies the conversion of the MCFA in ethyl esters, which are less toxic. In this way, fermentation aroma is even more enhanced, as ethyl esters of MCFA have more appealing sensorial qualities and are perceived at lower thresholds. Understanding MCFA's occurrence in grape must and wine and their inhibitory mechanisms can be useful for a better predictability and control during winemaking process. Certain technological factors were found to dramatically affect the concentrations of MCFA during winemaking, among which are the grapes ripening process, several technological interventions during winemaking and the yeast strains, all influencing style and perceived quality of wines. Furthermore, due to their inhibitory effects on yeasts, the MCFA have drawn the attention of researchers and producers as agents able to reduce the doses of SO_2 necessary for the cessation of alcoholic fermentation (AF) in order to obtain sweet wines. In this review inhibitory mechanisms are discussed, along with possible ways to control the MCFA concentrations during winemaking, also in the view of sweet wine production.

Key words*: MCFA, octanoic acid; decanoic acid; ethyl octanoate, ethyl decanoate, sweet.*

MODERN AND CURRENT CHEMICAL ANALYZES OF WINES FROM LOCAL AND AUTOCHTHONOUS QUALITY GRAPECULTIVARS IN THE AMPELOGRAPHIC COLLECTION OF SCDVV DRĂGĂŞANI

Ion BOŞTINARU[1], Sergiu-Ştefan GORJAN[2], Anca BECZE[3], Iulia TOROK[3]

[1]University of Craiova, A.I. Cuza Street, no. 13, Craiova, Dolj, Romania
[2]Research and Development Station for Viticulture and Vinification Drăgășani, Regele Ferdinand Blvd, no. 64, Zip Code: 245700, Drăgășani, Vâlcea, Romania
[3]INCDO-INOE 2000 Subsidiary ICIA, Research Institute for Analytical Instrumentation, ICIA, Donath Street, no. 67, CP 717, OP 5, 400293 Cluj-Napoca, Romania

Corresponding author email: ionutbostinaru@yahoo.com

Abstract

The research and analyzes were carried out in 2020-2022 at SCDVV Drăgăşani in the ampelographic collection, and at the Cluj Napoca wine analysis laboratory. The wine grape cultivars analyzed and studied were 'Crâmpoşie', 'Romanie,' 'Slaviţă', 'Teişor', 'Bătuta neagră', 'Negru mare', 'Negru vârtos', 'Negru Românesc', grape cultivars that are part of the national collection of germplasm of the Drăgăşani unit. The polyphenols, ascorbic acid, tartaric acid and heavy metals present in the wine were determined, both in the treated and untreated wines of these studied cultivars. Statistical calculations were performed for these wines using statistical indices such as: mean, variance (s2), standard deviation (s) and coefficient of variation (CV%). Statistical significance was determined using the "Multiple comparison test-Tukey Multiple Range Test Procedure ($p<0.05$)" method. The analyzes performed have shown that these wines are of high quality, the heavy metals in the wine do not exceed the normal limits, so these wines can be successfully classified as DOC and IG wines.

***Key words**: ampelographic collection, local grape cultivars, polyphenols, wine analysis laboratory, DOC and IG wines.*

STUDY ON THE IMPACT OF CLIMATE CHANGES ON THE PHENOLOGY AND ADAPTABILITY OF SOME VARIETIES INTENDED TO PRODUCTION QUALITY RED WINES

Georgeta Mihaela BUCUR, Marinela Vicuța STROE

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

Corresponding author email: marinelastroe@yahoo.com

Abstract

If until two or three decades ago, the limit of cultivation of varieties for red wines was located mainly in the regions of the southern half of our country, and only insularly in a few northern areas, as a result of the increase in thermal resources and solar radiation, this has expanded considerably, at the level of the entire country at the level of the entire country. In the medium term, the choice of varieties for red wines, when establishing new plantations in the north of the country, and not only, can be made from the existing international assortment, already tested, from the local viticultural germplasm, but in the long term the main solution is to cultivate the varieties new, created to better cope with climate change. The present paper aimed to follow the behavior of Cabernet cubin, Cabernet dorio and Cabernet dorsa varieties, not cultivated on a large scale so far in our country. The results showed that they have high biological resistance to frost and cryptogamic diseases, a good choice in the current climate context.

Key words*: adaptation, climate change, grapevine, genetic variability.*

OPPORTUNITIES FOR ENSURING THE PROFITABILITY OF A SMALL WINEMAKING HOLDING IN ROMANIA

Georgeta Mihaela BUCUR[1], Gabriela MATEI[2]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania
[2]Ministry of Agriculture and Rural Development, 24 Carol I Avenue, District 3, 020291, Bucharest, Romania

Corresponding author email: gabriela.matei.office@gmail.com

Abstract

The paper aimed to identify the opportunities to ensure the profitability of a small wine holding of 5.15 ha in Romania. It is based on the analysis of good practice models from Romania and Europe, as well as an economic and financial analysis of the current situation of the holding, together with a market study to identify the preferences of Romanian consumers in the field of wine tourism, culminating in exploring funding opportunities through the Common Agricultural Policy (CAP) in Romania for the period 2023-2027. Research shows that the profitability of wine production on a small wine-growing depends to a large extent on the visibility of the product, and wine tourism is the most effective way. Wine tourism is already known among romanians, with 44% of respondents having already experienced wine tourism home and abroad. As a conclusion, supporting a small-scale wine-growing holding implies, firstly, financial resources and, secondly, the development of complementary income-generating activities that increase the visibility of the agri-food products. Therefore, limited-edition quality wine can generate profits comparable to large wineries with adequate funding and the right image policy.

Key words: *winemaking, small vineyard, CAP in Romania, wine tourism, business profitability.*

ANALYSIS OF SOME BIOCHEMICAL COMPOUNDS INVOLVED IN ADAPTATION MECHANISMS OF VINE TO THE MINIMUM TEMPERATURES DURING THE DORMANT SEASON

Ramona CĂPRUCIU, **Daniela Doloris CICHI**,
Liviu Cristian MĂRĂCINEANU, Felicia STOICA

University of Craiova, A.I. Cuza Street, no. 13, Craiova, Dolj, Romania

Corresponding author email: ramona_capruciu@yahoo.com

Abstract

The state of endodormancy in the vine as an adaptation reaction to unfavorable temperature conditions, has a complex character and is the result of multiple biochemical and physiological processes that take place at the level of the tissues of the vine shoots. In this study, the adaptation and response reactions of Merlot, Cabernet Sauvignon and Fetească neagră grapevine varieties to the temperatures during the dormant season in the Banu Mărăcine wine-growing center are monitored, by following the evolution of some biochemical compounds involved in these mechanisms: evolution of free water (%), bound water (%), total water (%) and total dry matter (SUT %), as well as the evolution of carbohydrates (soluble sugar and starch) in annual and multiannual vine wood. A grouping of the analyzed varieties is made according to the storage potential of carbohydrates under the different conditions of minimum temperatures.

Key words*: dormeat season, grapevine varieties, biochemical compounds.*

THE IMPACT OF *SACCHAROMYCES* AND NON-*SACCHAROMYCES* YEASTS ON THE PHYSICO-CHEMICAL COMPOSITION OF WHITE WINES OBTAINED IN IASI - COPOU VINEYARD

Maria Iulia CERBU, Răzvan George NIŢĂ

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

Corresponding author email: cerbu.mariaiulia@yahoo.com

Abstract

Amino acids are the principal source of nitrogen for yeasts and as precursors for some aromas. For the human body, wine is a good source of undenatured amino acids, eight of them are essential and these are leucine, isoleucine, tryptophan, valine, lysine, phenylalanine, methionine and threonine. The aim of the paper is to evaluate the impact of non-Saccharomyces yeasts on the physico-chemical composition of white wines. In the present study, the effect of non-Saccharomyces yeasts on the content of amino acids in white wines was analysed. For this purpose, white wines obtained from Sauvignon blanc, Aligoté and Fetească albă grape varities in Iasi vineyard, vintage 2020. Different Saccharomyces and non-Saccharomyces yeasts were used on aliquots of Sauvignon blanc and blend of Aligoté and Feteasca alba, obtaining in the end 42 experimental samples. Results show an increase in amino acids content in the samples obtained by used oenological products with non-Saccharomyces yeasts. Amino acids in the largest amounts compared to control samples (A1, S1, DA1, DS1) were proline (DA3, DA2), leucine (A14, A9), lysine, alanine, phenylalanine and glutamic acid.

Key words*: wine, yeasts, non-Saccharomyces, microorganisms, amino acids, proline, alanine.*

TRENDS IN FETEASCĂ REGALĂ GRAPES YIELD AND SUGAR CONTENT IN SITE SPECIFIC CLIMATE

Octavian CIȘMAȘU, Antonia ODAGIU, Ioan OROIAN, Petru BURDUHOS

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

Corresponding author email: aodagiu@gmail.com

Abstract

In this article we analyze the evolution of the grapes yield and their sugar content belonging Fetească Regală vineyard variety cultivated in climatic conditions of Transylvanian region, Romania, covering the time period 2020-2022. In each experimental year, daily temperatures and precipitations were recorded during the grapevine vegetation period. Grapevine yield and sugar content was recorded at the end of each vegetation period. Averages were calculated yearly and by entire experimental period. Descriptive statistics and multiregression approach were implemented to calculate de averages, dispersion parameters, significance of differences, and relationships between the climatic factors and production traits. Overall datasets concerning grapes yields and their sugar content expressed a normal distribution. Our study emphasizes that precipitations have low influence on grapes yields and their sugar content, while temperature is positively associated with both above mentioned quantitative traits. When expressed by experimental years, even though increased temperatures led to higher yields and sugar content, no significant differences are reported among yearly values.

Key words*: production, precipitations, quantitative traits, temperature, vineyard.*

THE INFLUENCE OF PELICULAR MACERATION ON SOME CONSTITUENTS OF NEUTRAL WHITE WINES FROM THE DRĂGĂŞANI VINEYARD

Bogdan COSTEA, Giugea NICOLAE, Liviu-Cristian MĂRĂCINEANU, Felicia STOICA

University of Craiova, A.I. Cuza Street, no. 13, Craiova, Dolj, Romania

Corresponding author email: feliciastoica@yahoo.com

Abstract

In order to improve the composition and quality of `neutral` white wines from the Drăgăşani vineyard, pelicular maceration, in the primary biotechnology of elaboration, can be a real possibility. Through the appropriate choice of the main biotechnological factors specific to this modern technique, several technological and compositional parameters can be improved: yield in must, contents in alcohol, extract, ash. Alcoholic fermentation in pelicular maceration musts is enhanced, due to the higher proportions of nutritional constituents for yeasts, extracted from the solid phase. The main favorable effects of pelicular maceration refer, first of all, to: better extraction of the aromatic compounds of the varieties of the Vitis vinifera species; increasing the free aromatic potential in wines; increasing the extractivity of the processed products; favoring alcoholic fermentation.

Key words*: pelicular maceration, wine constituents, HPLC.*

RESEARCH CONCERNING THE REACTION OF VINES TO VARIABLE CLIMATIC CONDITIONS

Dorin Constantin COSTEA, Ramona CĂPRUCIU, Daniela Doloris CICHI, Constantin BĂDUCĂ CÎMPEANU

University of Craiova, A.I. Cuza Street, no. 13, Craiova, Dolj, Romania

Corresponding author email: dorin.costea@edu.ucv.ro

Abstract

Among the effects of climate change are the increase in the average annual temperature, the increase in the frequency of extreme meteorological phenomena, the reduction of the amount or the uneven distribution of precipitation during the period of vegetation, periods of drought betwixt the climatic factors, the water regime associated with the ambient temperature are determining environmental factors that affect all aspects of plant growth and development and have the most significant impact on the quality and the quantity of the production obtained. The grapevine has developed response mechanisms to cope with water stress and high temperature. These mechanisms include adaptations of a morphological, anatomical, physiological, biochemical nature that allow the vine to overcome periods of environmental stress but affect the quantity and quality of production. This paper presents the results of the studies on the response of the vines to the variable climatic conditions in the wine-growing area for the production of D.O.C. wines Banu Mărăcine.

Key words*: climatic conditions, vines, response mechanisms.*

THE INFLUENCE OF THE CLIMATE ON THE EVOLUTION OF DISEASES IN THE SAUVIGNON BLANC VARIETY IN THE CONDITIONS OF THE YEARS 2021-2022 IN MURFATLAR

Ionica DINA[1], Sergiu-Ayar ENE[1], Victoria ARTEM[1], Aurora RANCA[1], Mihaela HNATIUC[2]

[1]Research Station for Viticulture and Enology Murfatlar, 2 Calea Bucharest Street, Murfatlar, Romania
[2]Maritime University of Constanţa, 104 Mircea cel Bătrân Street, Constanţa, Romania

Corresponding author email: ayar_ene@yahoo.com

Abstract

The years 2021 and 2022 evolved differently from a climatic point of view, one being particularly rainy and the other being relatively dry. During this period, through the ERA-Net MERIAVINO project, studies were carried out on the Sauvignon blanc variety treated and untreated variants with phytosanitary protection substances regarding the degree of attack on the main diseases - Downy Mildew, Powdery Mildew and Gray Rot, along with determinations regarding stomatal conductance and sensor recordings for leaf humidity. The determinations that were made showed that the climatic factors, especially the precipitation and the relative humidity of the air have an uneven distribution during the vegetation period; determine the occurrence of cryptogamic diseases and have a great influence over the rate of extension of grapevine diseases (GA). In 2021, the degree of pathogen attack was higher compared to 2022, being directly correlated with the value of leaf humidity and also, the stomatal conductance determined for 4 days immediately after the appearance of the first symptoms of Plasmopara viticola and Botrytis cinerea infections recorded decreasing values.

Key words*: diseases, grapevine, leaf humidity, stomatal conductance, untreated.*

INTEGRATED MANAGEMENT OF VINEYARD PLANTATION - COMPARATIVE STUDY OF OLIVIA VARIETY AND FETEASCA NEAGRA 4VI CLONE

Oana-Silvia DINA VLĂDUCA[1], Roxana HOROIAŞ[2], Marian ION[3], Cezarina NECULA[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Boulevard, District 1, Bucharest, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, Faculty of Management and Rural Development, Slatina Branch, 150 Strehareti Street, 230088, Slatina, Olt, Romania
[3]Research and Development Institute for Viticulture and Enology Valea Călugărească, Valea Mantei Street, no. 1, Valea Călugărească, Romania

Corresponding author email: oana.dina.vladucu@gmail.com

Abstract

Knowledge of the biological, ecological, technological and managerial peculiarities applied in vineyard, as well as their integration in the context of sustainable development and the economic and resource crisis, is a permanent concern of the specialists working in this field of activity. This paper presents some of the results obtained from the research carried out within the ICDVV Valea Calugareasca during three agricultural years (2017-2019) regarding the management of the vineyard. The behaviour and adaptation to climate change of the Olivia variety and the Feteasca neagra 4VI clone were observed. These were chosen due to the fact that both were obtained at ICDVV Valea Calugareasca, they are intended for winemaking, they have the same ripening period (IV-V, depending on the characteristics of the agricultural year), and their production potential is similar (9.3 t/ha in the variety and 10.0 t/ha in the clone). The results indicate that, under identical eco-pedological and technological conditions, the Feteasca neagra 4VI clone adapted better to the climatic conditions of the research years, managing to obtain 9-16% higher yields compared to the Olivia variety.

Key words*: vineyard management, wine grapes, variety, clone, yields.*

IMPROVING SOME STEPS OF GRAPEVINE GROWING TECHNOLOGIES TO REDUCE PRODUCTION COSTS

Alina Georgeta DOBREI, Eleonora NISTOR, Daniela SCEDEI, Florin BORCA, Dragoș George CONSTANTINESCU, Alin Ionel DOBREI

University of Life Sciences "King Mihai I" from Timişoara,
119 Calea Aradului Street, Timișoara, Romania

Corresponding author email: alin1969tmro@yahoo.com

Abstract

Grapevine growing technologies require continuous adjustments to both climate instabilities and, in particular, current viticulture issues such as a sharp increase in prices for the vast majority of inputs and an increasing difficulty in finding labour at reasonable prices. The research focuses on a varietal assortment of five cultivars, as well as the main technological sequences of grapevine growing that require a significant amount of manual labour or inputs, such as soil management and summer pruning and activities. The influence of the experimental variants both on grape production and especially on the economic indicators was monitored. For each technological sequence, several experimental variants with different complexity were tried, adaptable to each vineyard with various technological and financial possibilities. In these circumstances, Romanian vineyards must align their organisation, management, and growing technologies in order to compete with products from other countries for quality and price. To achieve this goal, in addition to ongoing organisation and documentation, it is necessary to select technological options that allow for high-tech mechanisation which is critical for lowering costs while still maintaining grape quality and lowering carbon emissions.

Key words*: grapevine, grapes, wines, quality, profit.*

AGROBIOLOGICAL AND TECHNOLOGICAL CHARACTERISTICS OF TABLE GRAPES VARIETIES, GROWN IN THE TEMPERATE-CONTINENTAL CLIMATE FROM SOUTHWESTERN ROMANIA

Daniela Doloris CICHI, Ramona CĂPRUCIU, Nicolae GHEORGHIU, Felicia STOICA

University of Craiova, A.I. Cuza Street, no. 13, Craiova, Dolj, Romania

Corresponding author emails: ramona_capruciu@gmail.com, danielacichi@yahoo.com

Abstract

Ensuring a diverse range of grape varieties for fresh consumption, for as long as possible during a year, represents an equally important goal not only for producers but for traders as well. Our paper presents results regarding the evaluation of seven table grape varieties, six seeded varieties: 'Cardinal', 'Victoria', 'Muscat Hamburg', 'Alphonse Lavallée', 'Matilde', 'Black Magic' and one seedless variety, 'Attica', in specific pedo-climatic conditions from South-Western Romania. Observations, measurements and analyses were focused on: agrobiological, quantitative and qualitative characteristics (weight, length and width of bunch; berry weight, their length and width; grape yield, sugar content, titrable acidity, °Brix/ acidity ratio). The assessment of vulnerability of table grape varieties at winter temperature conditions were also analysed. In the conditions of a low supply and high demand for table grapes at the end of July -middle of August in our country, the good productions and early harvesting of the 'Victoria', 'Black Magic' seeded varieties and 'Attica' seedless variety, represents a high market opportunity for Romanian table grape producers.

Key words*: ampelographic features, grape market, grapevine, seedless.*

THE INFLUENCE OF TEMPERATURE ON THE YIELD OF CABERNET FRANC WINE VARIETY

Ferihan EMURLOVA

Agriculture Faculty, Trakya University, Campus,
Stara Zagora, Bulgaria

Corresponding author email: ferihan.emurlova@trakia-uni.bg

Abstract

The subject of the study are Cabernet Franc vines grown on a leached loam soil type. The yield of grapes from vineyards depends on the climatic conditions of the region, as well as on the amount of precipitation during the growing season. The trend of increasing temperatures and the lack of precipitation causes changes in the physiology of the vine and affects the quality and quantity of grapes obtained from one vine. The study was carried out during the period 2021-2022 and includes different options for vine rationing and defoliation. The installed weather station recorded critically high temperatures and drought which affected the delay of the vines to reach technological maturity.

Key words*: grapes, yield, temperature, vine.*

CLIMATIC CONDITIONS - IMPORTANT FACTOR OF THE GRAPES AND WINE TERROIR

Mariana GODOROJA, Gheorghe NICOLAESCU, Cornelia VOINESCO, Valeria PROCOPENCO, Olga MOGÎLDEA, Ion DOSCA, Dumitru VARTIC, Ina GRIZA

Technical University of Moldova, 48 Mirceşti Str., Chişinău, Republic of Moldova

Corresponding author email: m.godoroja@gmail.com

Abstract

The influence of terroir on the growth, development and productivity of the vineyard has been known since ancient times, but due to the increasingly changing climate, it is becoming an increasingly indispensable subject to study. The European continent remains to be affected by climate change, and the countries in the south-eastern part the most, or this was mentioned in the report `Climate change, impacts and vulnerability in Europe 2020`. The frequency and intensity of climate changes will impose the need to adapt technologies, the diversification of vine varieties or the adaptation of existing ones. The average air temperature on the territory of the Republic of Moldova registers an average increase of approximately 0.01ºC/year during the period 1887-2010. Recent years have also seen an increase in temperatures of over 1ºC compared to 10-15 years ago. The amount of water coming from the precipitation is less and less, and reaches the lower limit of non-irrigated vine cultivation.

Key words*: climate change, grapes, terroir, viticulture, wine.*

EFFECT OF MIXED CULTURE WITH *TORULASPORA DELBRUECKII* AND *SACCHAROMYCES CEREVISIAE* ON PHYSICO-CHEMICAL AND SENSORY CHARACTERISTICS OF YOUNG WINES

Marian ION[1], Florentina MATEI[2, 3], Steliana-Paula BARBU[1], Elena BRÎNDUŞE[1]

[1]Research and Development Institute for Viticulture and Enology Valea Călugărească, Valea Mantei Street, no. 1, Valea Călugărească, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania
[3]University Transilvania of Braşov, Alimentation and Tourism Faculty, Braşov, Romania

Corresponding author email: elabrinduse@gmail.com

Abstract

The present study aimed to evaluate the effect of pure and mixed culture fermentations with autochtonous yeast strains Torulaspora delbrueckii and Saccharomyces cerevisiae on physico-chemical and sensory qualities of Fetească albă and Fetească neagră young wines, at pilot scale. Yeast strains were isolated during different stages of spontaneous alcoholic fermentation and selected for their potential role in winemaking: 26 strains, 17 Saccharomyces cerevisiae strains and 9 non-Saccharomyces strains, from genera Candida, Torulaspora and Debaryomyces, were evaluated in terms of extracellular enzymatic activity, fermentative and technological characteristics. From these, two Saccharomyces cerevisiae strains were selected for esterase activity, and two non-Saccharomyces strains, Torulaspora delbrueckii species were selected for ß-glucosidase and esterase activity. Different yeast strains influenced the physico-chemical characteristics of the wines. The sensory qualities of the young wines produced with mixed cultures were positively influenced.

Key words*: mixed fermentation, wine yeasts, Torulaspora delbrueckii, Saccharomyces.*

PHYSICOCHEMICAL EVALUATION OF THE GRAPE AND WINE OF THE BLATINA, TRNJAK AND VRANAC IN DIFFERENT VINTAGES

Tatjana JOVANOVIĆ-CVETKOVIĆ[1], Rada GRBIĆ[1], Silva GROBELNIK MLAKAR[2], Borut BOSANČIĆ[1], Miljan CVETKOVIĆ[1]

[1]University of Banja Luka, Faculty of Agriculture, Bulevar vojvode Petra Bojovića 1a, Banja Luka, Republic of Srpska, B & H
[2]University of Maribor, Faculty of Agriculture and Life Sciences, Pivola 10, 2311 Hoče, Slovenia

Corresponding author email: tatjana.jovanovic-cvetkovic@agro.unibl.org

Abstract

Typicality and style of wine are closely related to the varietal character of grapes, ecological properties of the locality, and the specificities of the winemaking process. For this reason, autochthonous and indigenous grape varieties are increasingly the subject of many studies. To protect their uniqueness, in the region of Hercegovina (Bosnia and Herzegovina), indigenous grape varieties are part of the current grape and wine production. Therefore, the subject of a two-year study (2018-2019) were indigenous wine varieties: Blatina, Trnjak, and Vranac. Variations in the values of the analyzed parameters were a consequence of the significant and/or highly significant influence of the variety and year. Blatina stood out from other varieties with the highest average cluster weight (364.90 g) and the highest wine color intensity (10.71). Trnjak had the highest total anthocyanin content in the grape skin and total polyphenol content in the grape seeds (1090.198 mg/kg grapes; 1755.195 mg/kg grapes), while Vranac had the highest polyphenol content in the grape skin (1823.961mg/kg grapes), the highest TSS level (21.55% Brix), and consequently, the highest alcohol content in the wine (12.07% v/v).

Key words*: grape, indigenous varieties, quality, wine.*

ANTHOCYANINS LEVELS MODIFICATION ON WINES WITHOUT SULFUR DIOXIDE. NEW PERSPECTIVE.

Sorin MACOVICIUC

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

Corresponding author email: bogdan.cioroiu@gmail.com

Abstract

Anthocyanins are considered important compounds in wine production. Their role is important in wine color after first steps of vinification mainly in case of red and rose wins. Anthocyanins are involved in other supplementary steps as wine treatment and stabilization. Wine evolution produce modification of pH media, color or other physico-chemical parameters. Principal characteristics as aromas are determined by several reactions as acido-basic and redox which are related to modifications of wine composition. A HPLC method was involved in evaluation of several compounds as kuromanin, delphidin, petunidin, pelargonidin, malvidin, malvidin 3-glycoside and peonidin 3-glucoside which were separated and analysed in case of several wine samples from Cabernet Sauvignon and Cabernet Sauvignon Rose. Comparative profiles showed significant differences in levels of these compounds in case of the wines treated with sulfur dioxide and without sulfur dioxide. Conclusion is that use of natural compounds as pichia kluyveri yeasts not only prevented oxidation with implications in anthocyanins decrease but showed potency on the bacterial growth.

Key words*: HPLC, wines, sulfur dioxide, anthocyanins.*

THE TABLE GRAPES AND WINE SECTOR OF THE REPUBLIC OF MOLDOVA - ACHIEVEMENTS AND PERSPECTIVES

Olga MOGÎLDEA, Gheorghe NICOLAESCU, Svetlana COCIORVA, Mariana GODOROJA, Valeria PROCOPENCO, Cornelia VOINESCO

Technical University of Moldova, 48 Mirceşti Str., Chişinău, Republic of Moldova

Corresponding authors emails: olga.mogildea@h.utm.md, o.manolachi@gmail.com

Abstract

The wine sector in Moldova is strategic for the national economy. The activity of the sector is coordinated by ministry, also by the district agricultural directorates at the regional level. The wine-growing sector is divided into 4 regions with PGI: `Codru`, `Ştefan Vodă`, `Valul lui Traian` `Divin`. According to the data of the NBS, the area of vineyards is continuously decreasing, in 2021 it reached 117500 ha. By category of enterprises, it is distributed – 21.62% agricultural enterprises, 38.21% farmer farms and 40.17% family farms. The total area of vineyards with wine varieties is 99600 ha or 88.77%, but with table grapes varieties constitute 17900 ha. The average harvest was 4.54 t/ha for all types of farms. The total production of grapes in farms of all categories in 2021 was - 490700 tons, the largest total harvest in the last 5 years being recorded in 2018 with 730200 tons. Analyzing the OIV data for the period 2017-2021, we mention that in the 2018 we produced the highest volume of wine - 1900000 hl, and the lowest volume was in 2020 - 920000 hl.

Key words*: Republic of Moldova, table grapes, viticulture, varieties, wine.*

HARVEST AND QUALITY OF GRAPES OF DIFFERENT CLONES OF THE CABERNET SAUVIGNON VARIETY IN THE CODRU WINE-GROWING REGION OF THE REPUBLIC OF MOLDOVA

Gheorghe NICOLAESCU, Olga MOGÎLDEA, Cornelia VOINESCO, Mariana GODOROJA, Gheorghe MATCU, Dumitru VARTIC, Andrei KIMAKOVSKI

Technical University of Moldova, 48 Mirceşti Str., Chişinău, Republic of Moldova

Corresponding author emails: gheorghe.nicolaescu@fh.utm.md, gh.nicolaescu@gmail.com

Abstract

The improvement of grape varieties is inevitable in increasing the yield of grapes and the quality of wine. A wide range of clones within each grape variety are currently highlighted. The purpose of our research is to study the behavior of different clones of the Cabernet Sauvignon variety in the Mereni wine-growing area, the Codru wine-growing region of the Republic of Moldova. The Mereni wine-growing area includes the localities of the Anenii Noi district (approx. 30 km SE from the Chisinau city), it is characterized by uneven, warm winters and dry summers with low precipitation. The studied clones demonstrate the adaptability to the conditions of the Codru wine region and the obtaining of high quality wines.

Key words*: clones, Republic of Moldova, viticulture, wine varieties.*

THE INFLUENCE OF VITICULTURAL PRACTICES ON THE BERRY COMPOSITION OF MERLOT VARIETY GROWN IN THE WEST OF ROMANIA CLIMATE

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

[1]University of Life Sciences "King Mihai I[st]", Department of Horticulture, 119 Calea Aradului Street, 300645 Timişoara, Romania
[2]Universita degli Studi Firenze, Dipartimento Di Scienze Produzioni Agroalimentari E Dell'ambiente, Viale Delle Idee, 30, 50019 Sesto Fiorentino, Italy

Correspondent author emails: ghitaalina@yahoo.com, alin1969tmro@yahoo.com

Abstract

Recent climatic conditions have favoured the expansion of red varieties in previously unsuitable areas for high-quality winemaking. The high degree of temperature variability during the growing season makes it challenging for berries to fully ripen in time for harvest. The objective of this research was to improve the berry quality and sensory characteristics of the Merlot variety in the Recaş vineyards area by implementing various viticultural practices. The timing and intensity of leaf removal and cluster thinning were examined in experiments carried out in 2020 and 2021. The cluster thinning had a minimal effect on basic berry chemistry at harvest in 2020 but increased pruning weight and cluster weight. Vine vigour and essential berry chemistry were not strongly influenced by clusters thinning in 2021. The level of titratable acidity was lower after leaf removal, but other essential quality indicators remained unchanged. Viticultural practises not only increased the berry quality but also the anthocyanin content of berries.

Key words*: berry quality, cluster thinning, leaf removal, sugars, titratable acidity.*

THE ACIDITY IN THE MUST OF THE FETEASCA ALBA VARIETY, IN RELATION TO FERTILIZATION AND THE CONTENT OF MACROELEMENTS IN THE PLANT

Nicoleta Luminiţa PARASCHIV, Lucian RĂUS, Diana Elena BOLOHAN, Elena-Liliana CHELARIU, Bogdan-Vlad AVARVAREI, Mariana VOLF

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

Corresponding author email: mariana.volf@uaiasi.ro

Abstract

The research focused on the analysis of the impact of these macroelements, used in different doses and ratios, on the accumulations in the plant and on the production quality, respectively on the varied acidity of Feteasca Alba must. Values of the content in the plant of 2.12% N, of 0.183%, of 0.883 K as well as acidity values of 5.27 g/l H2SO4, by applying fertilizers in minimum necessary doses, certified by comparison with application in optimal doses, that they can be placed at the level of statistical insurance, except Kt from leaves, not statistically insured. It can be stated that the use of doses of fertilizers according to the criterion of sufficiency, in the analysed agro-eco-pedological context, ensures that the optimal experimental doses, optimal contents in the plant of macronutrients and implicitly, the nutrition environment is protected from pollution.

Key words*: foliar diagnosis, level of sufficiency, correlations.*

ASSESSMENT OF SOMACLONAL VARIATION IN MICROPROPAGATED GRAPEWINE CULTIVARS USING MOLECULAR MARKERS

Rodica POP, Doru PAMFIL, Monica HÂRŢA, Doina CLAPA, Mirela Irina CORDEA

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

Corresponding author email: mcordea@usamvcluj.ro

Abstract

Micropropagation of five grapevine cultivars (Fetească albă, Cabernet sauvignon, Merlot, Riesling Italian and Traminer roz) was performed using as explant source axillary shoots from field-grown plants. Shoot initiation and proliferation were performed on Murashige and Skoog (MS) medium with 0.5 mg/L NAA and BAP (0.5, 1.0 and 2.5 BAP mg/L). The proliferated shoots on V3 were used for the induction of the grapevine callus. Calli were then subcultured on fresh MS medium supplemented with 1.0 mg/L BAP +5.0 and 10 mg/l NAA (V4 –V5). The callus grown on V5 was transferred and sub-cultured on MS medium supplemented with 0.5 mg/L NAA and three different concentrations of TDZ (0.5; 1.0; 2.0 mg/L) for shoot regeneration. RAPD analysis was performed after the 12th subculture using the in vitro-raised plants from V6 culture medium and field-grown mature plants as control. The results of this study reveals that the highest number of somaclones were regenerated from Merlot cultivar and from Feteasca alba and Traminer roz cultivars only one somaclones. The induction of somaclonal variability is a valuable tool in the future grapevine breeding programs.

Key words*: Vitis vinifera, in vitro, somaclones, primers, callus.*

GLOBAL RADIATION AND ITS IMPORTANCE FOR WHITE (YOUNG) WINE QUALITY IN THE JIDVEI WINE-GROWING CENTER

Liana-Maria ROPAN[1], Raluca-Iuliana TRUŞCĂ (POPESCU)[1], Alina-Mariana ŞIMON[2], Nicolae GIUGEA[1], Claudia-Adriana HORŞIA[3]

[1]University of Craiova, 13 Alexandru Ioan Cuza Street, Craiova, Romania
[2]Research and Agricultural Development Station Turda, 27 Agriculturii Street, Turda, Romania
[3]Jidvei S.R.L, Research Department, 45 Gării Street, Jidvei, Romania

Corresponding author email: raluk_trusk@yahoo.com

Abstract

Through photosynthesis, the vine accumulates energy in the form of organic matter, absorbs radiant energy, and transforms it into chemical energy. The compounds in the juice of the grape berry have in their molecule a small amount of energy, estimated with the help of the heat of the reaction. The estimation of solar radiation was made by reading the annual average of global radiation, from the Jidvei viticultural center. Also, the calculation of the coefficient of conversion into chemical energy in the vine was followed. In the second part of the paper, the study showed that in the Riesling Italian and Feteasca regala grape varieties an association was established between global radiation and the analytical characteristics of young white wine, through the correlation method. It was appreciated that there is a very significant degree of correlation between the two studied variables in 90%, of cases given by a very important positive correlation coefficient. It remains the same percentage of 90%, given by a highly significant negative correlation coefficient for the characteristic acidity.

Key words*: vine, ecosystem, global radiation, energy, variety, analytical characteristics.*

TESTING RESULTS OF THE BM 86 "ARYSTA LIFE SCIENCE SAS" AS A FOLIAR FERTILIZER FOR VINES IN THE CONDITIONS OF THE REPUBLIC OF MOLDOVA

Andrei SIURIS [1], Andrei BOTNARENCO[2], Boris GĂINA[3], Maria GAMURAR[1]

[1]Institute of Pedology, Agrochemistry and Soil Protection "Nicolae Dimo", 100 Ialoveni Str., Chișinău, Republic of Moldova
[2]Scientific and Practical Institute of Horticulture and Food Technologies, 63 M. Kogalniceanu Street, Chișinău, Republic of Moldova
[3]Academy of Sciences of Moldova, 1 Stefan cel Mare și Sfânt Blvd, Chişinău, Republic of Moldova

Corresponding author email: siurisandrei@mail.ru

Abstract

The investigation purpose is to determine the influence of the foliar fertilizer BM 86 of the French company "Arysta Life Science SAS" on the quantity and quality of vine grapes. The foliar fertilizer BM 86 tested in the conditions of the Republic of Moldova demonstrated its effectiveness in the growth and development of vines manifested by increasing the yield and quality of grains compared to the standard (Cosir, 2.0 l/ha). Based on the test results, it was recommended to include fertilizer BM 86 at a dose of 3.0 l/ha in three foliar treatments of the vine in the State Register of Phytosanitary Products and Fertilizers in the Republic of Moldova..

Key words*: vines, foliar fertilizer, testing, productivity, quality.*

IDENTIFICATION OF SOME WINE GERMOPLASMA SINKS FROM ALBA COUNTY FOR THE PRODUCTION OF AUTHENTIC WINE PRODUCTS THROUGH THE APPLICATION OF SOME MINIMALLY INVASIVE TECHNOLOGIES

Mirela STĂNUŞ (RUJOIU)[1], Alina Georgeta DOBREI[2], Eleonora NISTOR[3], Alin DOBREI[4]

Banat University of Life Sciences "King Mihai I", 119 Calea Aradului Street, Timișoara, Romania

Corresponding author email: alin1969tmro@yahoo.com

Abstract

The research was carried out between 2020 and 2022, and includes the identification of some grapevine varieties and local biotypes grown in the yards, gardens, or vineyards of amateur winegrowers in order to produce some quality traditional products using a simplified, low-cost technology. Twelve local varieties and biotypes were grouped according to grape yield and compared to the control (widely used and well-known varieties in the area). Ampelographic indicators, production quality, disease and pest resistance, and last but not least, the level of technology used and specific economic indicators were all monitored. Some varieties and locally analyzed biotypes, such as 'Butuc alb', 'Vechi de Ighiu', 'Ruginiu de Alba', and 'Busuioaca de Ighiu', are viable options for biological viticulture because of their resistance to diseases and pests. These cultivars and biotypes are thought to be viable choices for biological viticulture, which is thought to be on the rise in Romania as well due to the need to reduce pollution, use of inputs, and last but not least, the acquisition of healthy viticultural products.

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

DETERMINATION OF THE AROMATIC PROFILE IN VARIETAL WINES FROM GRAPE VARIETIES (*VITIS VINÍFERA*) GROWN IN THE DRĂGĂȘANI VINEYARD

Felicia STOICA, Camelia MUNTEAN, Daniela CICHI, Constantin BĂDUCĂ, Ramona CĂPRUCIU, Alin BOȘTINARU

University of Craiova, 13 A. I. Cuza Street, Craiova, Dolj, România

Corresponding author email: feliciastoica@yahoo.com

Abstract

The aromatic profiles of eight white wines from Romanian and international grape varieties were analysed to characterize and also differentiate them. All wines come from the Drăgășani vineyard. Monoterpenes, higher alcohols, fatty acids ethyl esters, acetates were determined by gas chromatography-mass spectrometry (GC-MS). Alcohols were the most abundant class for Sauvignon, Muscat Ottonel varieties, esters for Italian Riesling, Fetească regală varieties. Terpenes (linalool, terpineol, nerol) were identified only in aromatic and semi-aromatic wines - Tâmâioasă românească, Muscat Ottonel and Sauvignon, Fetească regală. According to odor activity values (OAVs), not all of the determined compounds had concentrations higher than their odor thresholds.

Key words*: wine; aroma profile; volatile compound; Vitis vinifera, GC/MS.*

ESTIMATING THE TOLERANCE OF THREE TABLE GRAPE VARIETIES TO WATER STRESS BY CHLOROPHYLL FLUORESCENCE ANALYSIS

Andrei TĂNASE[1, 2], Dorin SUMEDREA[1], Alina FLOREA[1], Anca ONACHE[1], Magdalena NEGRU[3], Mihaela OPREA[3], Adrian ASĂNICĂ[2]

[1]National Research & Development Institute for Biotechnology in Horticulture, Bucharest-Piteşti Street, no. 37, Ştefăneşti - Argeş, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania
[3]University of Piteşti, Faculty of Sciences, Physical Education and Informatics, Department of Environmental Engineering and Applied Engineering Sciences, Piteşti, Romania

Corresponding author email: andrei.tanase1990@yahoo.com;

Abstract

Chlorophyll fluorescence analysis is one of the modern techniques used to study the effect of stress on the photosynthetic process. In our research, we monitored through periodic determinations the index of chlorophyll, the content of the main parameters of chlorophyll fluorescence and photosynthetic potential, in order to determine the thermal resistance threshold at three varieties of table grapes grown in the Stefanesti Arges county area. All plants analyzed were subjected to three temperature thresholds: 3.3-7.1ºC, 19.4-21.6ºC and 36.5-43.5ºC (increased heat stress). The 'Argessis' variety proved to be the most resistant, followed by 'Victoria', and the 'Augusta' variety was the most affected by high temperatures, with highly significant positive correlations. Very significant positive correlations were found between OJIP indicators and Phi_Do indicator, Pearson correlation values ranging from 0.749 to 0.701. These methods are supportive valuable indicators for establishing the tolerance of table grape varieties to water stress, for tailored irrigation management and for an appropriate choose of resilient varieties in the climate change context.

Key words*: Chlorophyll fluorescence water deficit, Vitis vinifera L, environmental drought stress, photosystem II efficiency.*

EVOLUTION OF THE OF CIS AND TRANS-RESVERATROL IN WINES OBTAINED THROUGH INOCULATION WITH ACTIVE DRY YEAST AT PIETROASA VINEYARD

Raluca URMUZACHE[1], Cornel Daniel BANIȚĂ[1], Florentina ISRAEL ROMING[1], Iuliana-Diana BĂRBULESCU[1], Mihaela BEGEA[3], Mihai FRÎNCU[1], Corina DUMITRACHE[2], Petruta Mihaela MATEI[3], Dumitru DRĂGĂTOIU[1], Răzvan Ionuţ TEODORESCU[1]

[1]University os Agronomic Sciences and Veterinary Medicine of Bucharest, 59, Marasti Blvd, Bucharest, Romania
[2]University Politehnica of Bucharest, 202, Splaiul Independentei, Bucharest, Romania
[3]Universidad de Valladolid, Agriculture and Forestry Engineering Department, Avenida de Madrid 44, 34004 Palencia, Spain

Corresponding author emails: barbulescudia@yahoo.com; petruta_99@yahoo.com

Abstract

This paper presents the results of the testing during the winemaking process using commercial active dry yeasts (CADY) in parallel with yeast biomass produced based on yeasts isolated from Pietroasa area (Romania) (PAY). PAYs were obtained based on autochthonous yeasts isolated from Busuioaca de Bohotin (BB) and Tamaioasa Romaneasca (TR) grape varieties. Two variants of must for each grape variety were taken in study, i.e. obtained from early harvested grapes (TRD and BBD) and from late harvested grapes (TRS and BBS). Winemaking experiments were carried out with 7 types of commercial yeasts and two types of commercial nutrients. The alcoholic concentration of the experimental wines varied from 11.8 % for WTRD to 18.4 % for WBBD. The WBBD&S samples showed a higher average trans-resveratrol content (1.716 and 1.555 mg/L, respectively) compared to the WTRD&S wine samples (0.590 and 1.365 mg/L, respectively). The variation in the cis-resveratrol content between the experimental variants produced with PAY was not significant.

Key words*: autochnonous yeast, biomass, cis-resveratrol, trans-resveratrol.*

VEGETABLE GROWING

EFFECT OF SPRAYING HORNWORT AND BORON ON CHEMICAL PARAMETERS OF POTATA PLANT

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

University of Kufa, Faculity of Agriculture, KUFA, Iraq

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

Abstract

Field experiment was conducted in a farm of Najaf governorate during 2020-2021season, to study the effect of spraying with different concentrations of hornwort and boron fertilize as Boric acid on chemical parameters of potato. The experiment included 9 treatments concerning in three different concentrations of hornwort (0, 10 and 20 ml L^{-1}) and three different concentrations of Boric acid (0, 15 and 30 mg L^{-1}). Factorial experiment within Randomized Complete Block Design (R. C. B. D.) was used with three replications. Results can be summarized as follows: the use of different concentrations of hornwort with conc. 20 ml $L^{-1}$and boric acid (H3BO3) with conc. 30 mg L^{-1} had significant effects on most of the chemical parameters such as: N, P, K, total soluble carbohydrate and total Chlorophyll in Leaves and N, P, K, T.S.S and amount of vitamin C in tubers compared with control treatment which gave the least values for the above-mentioned parameters.

Key words*: potato, Hornwort, boric acid.*

PRELIMINARY STUDY ON THE FRUIT MORPHOLOGY, AGRONOMIC, AND PHYSIO-CHEMICAL CHARACTERISTICS OF TOMATO VARIETIES IN GREENHOUSE CONDITIONS

Andreea ANTAL-TREMURICI, Silvica AMBĂRUŞ, Alexandru BUTE, Petre Marian BREZEANU, Gabriel-Alin IOSOB, Creola BREZEANU

Vegetable Research and Development Station Bacău,
220 Bârlad Street, Bacău, Romania

Corresponding author email: antal_andreea97@yahoo.com

Abstract

Greenhouses are now one of the most effective industries in agricultural structure, used to preserve a monitored environment suitable for crop management throughout the year. The demand for tomato products is increasing year after year, providing ample opportunities for the tomato market to grow. The variety of tomato genotypes provides a gene pool for future breeding, because they may contain traits useful for the development of new varieties and hybrids with improved quantitative and qualitative characteristics. The study aimed to evaluate the performance of five indeterminate genotypes of tomato to determine their performance under greenhouse conditions. The research was conducted utilizing biological material from the Vegetable Research and Development Station in Bacau. The data collected were: number of days till appearance of the first flowers, number of days till first fruit development, date of first harvest, as well as the outer color of the immature and ripe fruit. The results of investigations on phenotype characteristics such as fruit weight, height, diameter, dry matter content, TSS, water, minerals, and titratable acidity are discussed in the paper.

Key words*: greenhouse tomato quality, growing conditions, genotypes, local cultivar, solanaceous.*

STUDY REGARDING THE INFLUENCE OF SOME CLIMATIC PARAMETERS FROM THE GREENHOUSE ON THE TOMATO PRODUCTION AND FRUITS QUALITY

Arshad ADNAN, Ovidiu Ionuţ JERCA, Liliana BĂDULESCU

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

Corresponding author email: draghiciem@yahoo.com

Abstract

The study was conducted under controlled conditions in a greenhouse during an autumn-spring tomato harvest cycle. The culture was carried out in an unconventional system, on coconut substrate. All environmental factors were recorded and correlations were made with all vegetation parameters. The cultivar Cheramy F1 was used. At planting, the seedling was 40 days old, a height between 38-43 cm and a number of 6.33 true leaves. The planting was carried out directly on the culture substrate after its prior moistening. Differences in growth rate were noted depending on the temperature in the culture space. The aim of the study was to analyze the influence of some growth and fruiting parameters on the total production and its quality.

Key words*: greenhouse, soilless, tomatoes, cherries, Cheramy F1.*

REVIEW ON THE SUSTAINABILITY OF SOME REGENERATIVE AGRICULTURE PRACTICES FOR ORGANIC VEGETABLE GROWING

Dan Ioan AVASILOAIEI, Mariana CALARA, Marian Petre BREZEANU, Tina Oana CRISTEA

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

Corresponding author email: calaramariana@gmail.com

Abstract

Both the dynamics of world geopolitics and the environmental challenges rises a series of concerns for agriculture, in general, and vegetable growing, in particular, especially regarding the price and the carbon footprint of the inputs that are used.
In this regard, the trend of applying technologies that promotes the existence of cohesion and harmony between the various technological links at farm level becomes obvious. Among these, especially in the last decade, a particular amplitude is manifested in terms of regenerative agriculture practices. The present paper aims to evaluate the degree of regenerative agriculture practices sustainability with direct applicability to the ecological vegetable cultivation, highlighting the analogy of the two agricultural systems. In this respect, a relevant number of studies that addressed the topics involved were assessed, trying to synthesize the conclusive results and also to draw some potential directions to be followed in the very near future.

Key words*: regenerative agriculture; carbon footprint; vegetable cultivation; technological links; soil organic matter.*

STUDY OF THE DISTBUTION OF TOMATO BROWN RUGOSE FRUIT VIRUS (ToBRFV) IN SOUTHERN BULGARIA

Zhelyu AVRAMOV

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

Corresponding author email: zhavramov@ltu.bg

Abstract

The aim of the study is to analyze and investigate viral pathogens on tomatoes and peppers to detect Tomato Brown Rugose Fruit Virus (ToBRFV) in seeds and plant samples. The only hosts of Tomato brown rugose fruit virus are tomato (Solanum lycopersicum L.) and pepper (Capsicum annuum L.). The spread of ToBRFV carries major risks in tomato and pepper cultivation which are important crops grown in Europe. The symptoms resemble those of other viral infections, such as Tomato Mosaic virus, Pepino Mosaic virus and others found in Bulgaria. To achieve the aim of the study and establish ToBRFV over the two-year period, laboratory analyses were performed on more than 28 seed samples of tomates and peppers, imported or in movement within the EC. About 47 plant samples from greenhouses, with the origin of the plants from other countries, were also analyzed. Samples were tested using the ELISA method for five viruses. As a result of this mass screening, the ToBRFV virus was detected on tomato seeds in Bulgaria for the first time. On the recommendation by the phytosanitary authorities, the infected seeds and the tomato plants produced from them were destroyed in order to prevent and limit the future spread of Tomato Brown Rugose Fruit Virus on the territory of Bulgaria.

Key words*: ToBRFV, ELISA method, spread, destruction, Bulgaria.*

THE VARIATION OF CUCUMBER QUALITY DEPENDING ON THE HYBRID AND THE FRUIT HARVESTING INTERVAL

Alexandra BECHERESCU[1], Gheorghița HOZA[2], Florin SALA[1, 3]

[1]University of Life Sciences "King Mihai I" from Timişoara, Timișoara, 300645, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania
[3]Agricultural Research and Development Station Lovrin, Lovrin, 307250, Romania

Corresponding author emails: hozagh@yahoo.com, florin_sala@usab-tm.ro

Abstract

The study evaluated the quality of cucumber production in relation to the hybrids and harvest interval. Five gynoecious cucumber hybrids were cultivated: Madrilène F1 (Seminis), Cantara F1, Kibria F1, Majestosa RZ F1 and Trilogy RZ F1 (Rjik Zwaan). An adequate watering and fertilization regime was ensured. Cucumbers were harvested daily, over a period of 67 days. The highest production of cucumbers was registered with the hybrid Madrilene F1 (Mad), 1034 kg/100 m^2, and the lowest production with the hybrid Trilogy RZ F1 (Tri), 778 kg/100 m^2 in Q1 quality classes (8-12 cm long). The Trilogy RZ F1 (Tri) hybrid had the best share of production in quality class Q1 (97.30%) among all the hybrids under the study conditions (97.10% for Cantara F1 hybrid in Q1; 96.95% for Kibria hybrid in Q1; 96.07% for Majestosa RZ F1 hybrid in Q1, and respectively 91.39% for Madrilene F1 hybrid in Q1). PC1 explained 83.538% of variance, and PC2 explained 7.4489% of variance for the quality class Q1. PC1 explained 59.126% of variance and PC2 explained 19.194% of variance for the quality class Q2.

Key words*: cluster analysis; cucumbers; harvest interval; PCA; quality classes.*

PRELIMINARY RESULTS ON THE ACCLIMATIZATION OF A NEW SPECIES OF THE *SOLANACEAE* FAMILY IN ROMANIA

Camelia BRATU[1], Florin STĂNICĂ[2], Costel VÎNĂTORU[1], Bianca MUȘAT[1], Geanina NEGOȘANU[1], Matilda POPESCU[1]

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

Corresponding author email: cameliaboteabratu@gmail.com

Abstract

The Solanaceae family has been of interest since ancient times, due to the numerous directions of use. Most are decorative species, others are cultivated for their medicinal, insecticidal, and culinary properties. The Solanum melongena species is much appreciated for its high production capacity, but also for the varied shapes, tastes, and textures of the fruits. After the 2000s, in Romania, research on the acclimatization of new species has reached new horizons, with many species being studied. PGRB Buzau has also focused its research on acclimatization and breeding of new species, including Solanum viride, known as poroporo. Although it is native to the Pacific, in particular to the Fiji Islands, the species has shown high adaptability to the climatic conditions of Romania. Plants with a high production capacity, abundant fructification, and increased resistance to the main pathogens specific to the species have been recorded. Research will continue, following phenotypic and biometric determinations, production indices, as well as the chemical composition of the fruits.

Key words*: Solanum viride, poroporo, germplasm collection, genebank, morphotype.*

AGRONOMIC PERFORMANCE OF CLIMBING BEAN CULTIVARS IN INTERCROPPING WITH SWEET MAIZE

Petre Marian BREZEANU, Silvica AMBARUS, Andreea TREMURICI, Alexandru BUTE, Mariana CALARA, Dan Ioan AVASILOAIEI, Gabriel Alin IOSOB, Creola BREZEANU

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

Corresponding author email: creola.brezeanu@yahoo.com

Abstract

Bean maize intercropping is an old cultivation scheme practiced at small scale by traditional farmers in Romania. Literature highlights the benefits of intercropping and the constrains related extension of this practice on largest areas. Studies on interspecific interactions have paramount importance in view of development of feasible approaches of environmentally friendly cultivation practices and for genetic improvement specific for performance in intercropping. Five climbing bean varieties were evaluated in sole cropping and in intercropping with one type of sweet maize cultivar. Sowing was successively caried out in an interval of 30 days, bean following maize. The performance of bean genotypes in each cropping system was assessed by phenotyping, of different traits. The results show a significant bean genotype × cropping system interaction for flowering and for seed yield. The most competitive bean varieties were taller, more vigorous, and late to maturity. Diversification of cultural systems by implementing bean maize intercropping seems to be an effective strategy in pest management, and further research will provide a basis for incorporating practical pest control schemes into intercropping systems.

Key words*: Phaseolus vulgaris, cropping, phenotyping, yield.*

INFLUENCES OF PLANT DENSITY AND SEEDLING PLANTING DATES ON CABBAGE (*BRASSICA OLERACEA VAR. CAPITATA*) SEED PRODUCTION EFFICIENCY

Alexandru BUTE, Andreea ANTAL-TREMURICI, Creola BREZEANU, Silvica AMBĂRUŞ, Petre Marian BREZEANU, Gabriel-Alin IOSOB, Mariana CALARA

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

Corresponding author email: alexandru.bute@outlook.com

Abstract

Cabbage (Brassica oleracea var. capitata) is a prevalent vegetable crop cultivated for its nutritious leaves, which have a variety of culinary and medicinal use. As a consequence, vegetables such as cabbage are extremely popular among consumer demands. Constraints in the seed production chain highlight the significance of seed germination and crop`s growth at the farm level. The production of high-quality seeds is a crucial step in this crop`s cultivation since it impacts the success of germination and plant growth. In this study, we aimed to investigate the influence of plant density and seedling planting dates on cabbage seed process performance. This research is a component of a larger project aimed to devise a comprehensive and new modernized strategy for cabbage seed production. The experiment was carried out on `Silviana` autumn cabbage variety during two growing seasons, a field trial was undertaken to assess three plant densities (low, medium and high) and three seedling planting dates (early, mid-season and late). Cabbage seeds were also subjected to a range of seed viability and vigor tests.

Key words*: seed yield, germination, Brassicaceae, cole crops, plant spacing.*

ALLELOPATHIC POTENTIAL ASSESSMENT OF DIFFERENT VEGETAL EXTRACTS ON LETTUCE SEED GERMINATION

Mariana CALARA[1], Neculai MUNTEANU[2], Creola BREZEANU[1], Petre Marian BREZEANU[1], Dan Ioan AVASILOAIEI[1]

[1]Vegetable Research and Development Station Bacău (VRDS), Calea Bârladului, no. 220, Bacău, Romania
[2]University of Life Sciences "Ion Ionescu de la Brad" of Iaşi, Mihail Sadoveanu Aleey, no. 3, 700490, Iaşi, Romania

Corresponding author email: avasiloaiei_dan_ioan@yahoo.com

Abstract

The aim of the present work was to evaluate the allelopathic influence of different vegetal extracts on the seed germination of lettuce (Lactuca sativa) as test plant. Eight experimental variants have been studied (including Control). The species used for aqueous extracts were: Amaranthus retroflexus, Aquilegia vulgaris, Atriplex hortensis, Chenopodium ficifolium, Cirsium avense, Echinochloa crus-galli, Elytrigia intermedia, Juglans regia, Lactuca serriola, Leucanthemum vulgare, Parthenocissus inserta, Phragmites australis, Poa pratensis, Polygonum aviculare, Portulaca oleracea, Sambuscus ebulus, Solidago gigantea, Xanthium strumarium, Convolvulus arvensis, Vicia sativa, Pinus sylvestris, Helianthus tuberosus. Aqueous extracts from fresh biomass were examined under laboratory bioassay in Petri dishes. The obtained results suggest that the extract from common vetch, canada thistle, red-root amaranth, common purslane and cockspur display more serious allelopathic effects on the seed germination of lettuce. Thus, the study of vegetal extracts with potentials allelopathic effect can lead to development of some new herbicides with low environmental impact.

Key words*: aqueous extracts, allelopathic effects, new herbicides, environmental impact.*

STUDY ON THE ESTABLISHMENT OF THE SSR AND RADP METHOD FOR THE IDENTIFICATION OF THE GENE THAT CONTROLS THE ANTISEPTIC ACTION IN SOME BASIL GENOTYPES

Mădălin CHIOUARU, Adrian CHIRA, Constantin PĂUN, Maria ADOCHIȚEI , Ioana KLEE, Ligia ION, Daniel NAGY

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

Corresponding author email: ionnagyligia@yahoo.fr

Abstract

In conventional breeding, the results and speed of response obtained by applying phenotypic selection depended on the possibility of distinguishing and capitalizing on genetic variations, taking into account the fact that the most important characters are polygenic and therefore strongly influenced by the environment. The PCR method allowed rapid screening in populations of 100 individuals. DNA isolation methods have as basic criteria the purity, integrity and quantity of DNA obtained. DNA purity has been demonstrated to be one of the most important factors in the reproducibility of the RAPD method. The use of DNA template with a high purity ensures reproducibility by the RAPD method. These methods aim at the elimination of polyphenols and polysaccharides that determine the isolation of some DNA extracts with a brown color, inaccessible to restriction enzymes. The genomic DNA isolated from the basil genotypes, "Aromat de Buzau", "BZ 1", "Hofigal 2", "Geea", "LBRS 2", "LBVS 1", was used to implement two types of molecular marker SSR and RADP to highlight the gene that controls antiseptic action. The most effective remains the SSR method.

***Key words**: PCR, DNA genomic, molecular markers, genes.*

EVALUATION OF BIOMASS PRODUCTION OF *STEVIA REBAUDIANA* BERTONI USING CLASSICAL *IN VITRO* CULTURE AND TEMPORARY IMMERSION BIOREACTOR SYSTEM

Doina CLAPA, Monica HÂRȚA

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

Corresponding author email: monica.harta@usamvcluj.ro

Abstract

In vitro cultures can provide a sufficient quantity of high-quality uniform biomass under controlled conditions. The aim of this study was to develop an efficient micropropagation system for biomass production from S. rebaudiana. In vitro shoot proliferation of S. rebaudiana was compared in classical agar-gelled solid culture medium (SM) and the Plantform temporary ımmersion bioreactor system (TIS). Murashige and Skoog 1962 (MS) medium was used in both culture systems and was supplemented with 0, 0.1, 0.2, and 0.3 mg/L 6-Benzyladenine (BA). The maximum biomass production (1396.72 ± 54.03 mg) was recorded using the TIS in the variant with a concentration of 0.2 mg/L BA. The lowest biomass production (229.96 ± 29.33 mg) was obtained on MS solid culture media without BA. It is noteworthy that the water content tended to decrease in TIS compared to SM. In vitro-grown plantlets were screened for possible genetic differences using Start Codon Targeted (SCoT). The PCR amplification products were monomorphic in micropropagated plants and their mother plant, thus proving the genetic fidelity and uniformity of the plants grown in vitro for biomass production.

Key words*: fresh weight, genetic fidelity, solid media, plantform, Start Codon Targeted Polymorphism.*

RESEARCH ON THE BEHAVIOR OF SOME SWEET POTATO GENOTYPES CULTIVATED ON THE SANDY SOILS OF SOUTHERN ROMANIA

Gheorghe COTEȚ[1], Aurelia DIACONU [1], Ștefan NANU[1], Nicoleta-Alina PARASCHIV[1], Milica DIMA[1], Rodi MITREA[2]

[1]Research-Development Station for Plant Culture on Sands Dăbuleni, 217 Petre Baniţă Street, Călăraşi, Romania
[2]University of Craiova, 13 Alexandru Ioan Cuza Street, 200585, Craiova, Dolj, Romania

Corresponding author email: georgecotet1968@gmail.com

Abstract

In order to increase the degree of food security in the areas affected by thermohydric stress in Romania, the aim is to identify new species of plants that can optimally exploit the microclimate of the area, through their biological potential. The pedoclimatic conditions recorded in the southern part of Romania offer an optimal microclimate for the growth and development of the sweet potato plant (Ipomoea batatas), which is a thermophilic plant, specific to tropical and subtropical areas. Research carried out between 2020-2022 on the sandy soils of southern Oltenia, showed that the sweet potato genotypes studied behaved differently in terms of tuber quality, accumulating a total amount of dry matter between 27% for the variety JUHWANGMI and 46.98 % in the variety HAYANMI, with a variety average of 35.35 %. Obtaining competitive productions is influenced by the choice of the most suitable sweet potato genotypes for the area of sandy soils in S-W Oltenia. The average production for the three years of the study showed values between 17804 kg/ha for the DCh 19/3 genotype and 53368 kg/ha for the DK 19/1 genotype.

Key words*: sweet potato, genotypes, sandy soil, production, diseases.*

DETERMINATION OF THE MINERAL PROFILE OF POTATOES PEEL, BY-PRODUCT FROM POTATO PROCESSING - A PRELIMINARY STUDY

Antoanela COZMA[1], Casiana MIHUT[1], Ariana VELCIOV[1], Codruta CHIS[1], Sofia POPESCU[1], Bogdan COZMA[1], Vlad MARAZAN[1], Maria RADA[2], Ersilia ALEXA[1]

[1]University of Life Sciences "King Mihai I " from Timisoara, 119 Calea Aradului Street, 300645, Timisoara, Romania
[2]University of Medicine and Pharmacy "Victor Babes " from Timisoara, 2 Eftimie Murgu Square, Timisoara, Romania

Corresponding author email: radamariam@gmail.com

Abstract

Potatoes play an important role in ensuring global food security. The potato peel, resulting as a by-product from the processing of potatoes, still contains available quantities of nutrient compounds, among which the mineral elements are counted. The purpose of this study is to determine the mineral profile of the potato peel obtained by peeling some local potatoes, in order to use them to enrich the mineral intake of some food products. The total concentrations of Na, K, Ca, Mg, Fe, Mn, Zn and Cu potato peel from potatoes sold in agro-food markets from Timisoara city (Romania) were determined. Preliminary results revealed that 100g of dried potato peel contain appreciable amounts of essential elements: 38.60 – 82.30 mg/100 g Na, 1856-2531 mg/100 g K, 155-201 mg/100 g Ca, 122-193 mg/100 g Mg, 4.62-10.88 mg/100 g Fe, 0.64-1.22 mg/100 g Mn, 1.61-2.53 mg/100 g Zn, 0.78-1.60 mg/100 g Cu. These values suggest that these by-products, after proper processing, could be introduced into the diet as a source of essential minerals.

Key words*: potato, potatoes peel, essential minerals.*

CHANGES OF MORPHOGENETIC PATTERNS OF PLANTS CULTIVATED *IN VITRO* UNDER THE INFLUENCE OF SALICYLIC ACID EMPLOYED AS A TRIGGER OF ANTIOXIDANT DEFENCE MECANISMS IN CABBAGE PLANTS

Tina Oana CRISTEA, Gabriel-Alin IOSOB, Alexandru BUTE

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

Corresponding author email: iosob.gabriel@gmail.com

Abstract

Salicylic acid is a stress-signal molecule that is involved in the modulation of growth and development of plants. There is evidence that this stress-signal molecule has a positive impact on the antioxidant defence system, but few studies have been done on determining the most effective concentration and its impact on the growth and development of cabbage plants cultivated "in vitro". In the present experiment we assessed the impact of three different concentration of salicylic acid (1 mM/l, 0.5 mM/l and 0.1 mM/l) on seed germination indexes, shoot initiation and proliferation, root development as well as physiologic traits (phenolic and chlorophyll content). It has been found that a concentration of 1mM SA inhibited both seed germination and shoot development, which is probably related with suppression of GA-mediated pathway. Instead, the addition of 0.1 mM SA stimulated shoot proliferation rate, shortened the time for shoot initiation and increased shoot and root elongation. Our results provide the foundation of further studies related to the plant`s agronomic performances when cultivated in the field.

Key words*: shoot, roots, regeneration, defence-related process, germination.*

A REVIEW OF PLANT-BASED, HIGH PROTEIN SNACK BARS: COMPOSITION, NUTRITIONAL VALUE AND HEALTH BENEFITS

Mihaela Cristina DRĂGHICI, Mihaela GEICU-CRISTEA, Elisabeta Elena POPA, Paul-Alexandru POPESCU, Amalia Carmen MITELUȚ, Mona Elena POPA

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

Corresponding author email: paul.alex.popescu@gmail.com

Abstract

In present days, consumers tend to spend more effort and time in order to find a well-balanced diet for maintaining a healthy life-style despite the daily-life problems that occur because of the current life and work style. Alternative food products such as functional foods or nutraceuticals are gaining more sympathy from the general consumers because they can prevent diseases and uphold a healthier life. Food products that are convenient for consumption, storage, and handling are being sought after by consumers. Snack-bars are ready-to-eat nutritious products, that can contain different vitamins, proteins and other components that are of value for the human nutrition, and are also easy to eat. Snack-bars can be used as a meal replacement, as desserts or as salty snacks throughout the day, and their consumption is influenced by different factors such as protein content, sugar content, protein and fibre content or vitamin content. This review aims to highlight the current researches in the development of plant-based, high protein snack bars, and their composition, nutritional value and health benefits.

Key words*: plant-based snack bar, health benefits, functional food, protein content.*

PRELIMINARY DATA REGARDING THE APPLICATION OF *BACILLUS* SPP. IN THE CULTURE TECHNOLOGY OF PROTECTED TOMATOES IN ORDER TO INCREASE PRODUCTIVITY IN THE BUCHAREST AREA

Claudia-Loredana DRAGOMIR[1], Gheorghița HOZA[1], Alexandra BECHERESCU[3], Liliana BĂDULESCU[1, 2], Ioana CĂTUNEANU[1, 2], Aurora DOBRIN[2], Carmen CONSTANTIN[2], Dorel HOZA[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, Faculty of Horticulture, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, Research Center for Studies of Food Quality and Agricultural Products, 59 Mărăști Blvd, District 1, Bucharest, Romania
[3]University of Life Sciences "King Mihai I", 119 Calea Aradului Street, 300645, Timișoara, Romania

Corresponding author email: alexandra_becherescu@yahoo.com

Abstract

Now the current trend in agriculture around the world deals with promoting growth and controlling crop diseases and pests organically by reducing or even eliminating the application of chemicals. In the present study, soil and foliar biostimulating products containing Bacillus spp. (Bactilis, Leaf Power, NitroStim and Rizobac) were tested in the greenhouse on three tomato hybrids in order to increase production through a more environmentally friendly technology. The following parameters were monitored: stem diameter in the lower part, the plants height, the sequence of the inflorescences, the number of flowers and fruits on the plant and on the inflorescences, the percentage of fruits on the plant and in inflorescences, the production of fruits on the plant, fruits firmness, total dry matter, total soluble solids, titratable acidity.The results showed that, the application of Rizobac on Kingset and Bucanero hybrids, led to an increase of the number of inflorescences and fruits.. The size of the fruit was most positively influenced by the application of Bactilis fertilizers, the increase being between 6-15% depending on the hybrid. The hybrid-fertilizer combination is important and influences the production obtained.

Key words*: biological, fertilizers, microorganisms, production, PGPR, vegetables.*

OPTIMICATION OF SCHEMES FOR REPRODUCTION OF STEVIA VARIETY 'STELA'

Stanimir ENCHEV, Tzvetan KIKINDONOV

Agricultural Academy, Agricultural Institute - Shumen,
3 Simeon Veliki Blvd, 9700, Bulgaria

Corresponding author email: stanimir_en@abv.bg

Abstract

In Agricultural Institute - Shumen it has been carried out maintenance and multiplication of the first Bulgarian stevia variety 'Stela', certified in 2017. In vitro technics for maintenance and micropropagation are used, as well as in vivo development of seedlings from cuttings by preservation and reproduction of rhizomes. During the last years are often the conditions of warm and continuous autumn with a regime of the short day from the end of September, which favors the reproductive development of seeds. The results for the measured indices of height, number of stems, fresh and dry mass and the calculated randeman and dry leaves yield of seed off-springs are indicative for the stabilization of comparatively high levels of productivity of elite clones of the variety 'Stela'. The assessment shows that the most effective scheme for practical realization of seedlings is by sowing seeds in controlled conditions in January-February, diving off the germinated and stabilized plants in April-May, transplanting in June-July and receipt of formed rhizomes in September-October, which, after preservation to be realized during the next period.

Key words*: stevia, variety maintenance, reproduction.*

STUDYING THE INFLUENCE OF BIOLOGICAL FERTILIZATION ON RADISHES IN UNHEATED POLYETHYLENE GREENHOUSES

Stoyan FILIPOV[1], Kostadin KOSTADINOV[1], Radoslav CHIPINSKI[2], Nadejda SHOPOVA[3]

[1]Agricultural University - Plovdiv, AU, 12 Mendeleev Blvd, 4000 Plovdiv, Bulgaria
[2]Institute of Plant Genetic Resources "K. Malkov", 2 Drujba Str., 4122, Sadovo, Bulgaria
[3]Climate, Atmosphere and Water Research Institute at Bulgarian Academy of Sciences (CAWRI-BAS), 66, Tzarigradsko chaussee Blvd, 1784 Sofia, Bulgaria

Corresponding author email: stoyanf@aqbv.bg

Abstract

In an experiment with greenhouse radishes grown according to biological production technology during the period 2018-2020, the influence of the variety, the cultivation scheme, the method of sowing and the applied biological fertilizers on the morphological characteristics and productivity of the crop was evaluated.In scattered sowing, the mass of the whole plant, the mass and the diameter of the root crop were positively affected by the applied biological fertilizers. The yield of ties per unit area has increased to a greater extent in the Edri red variety compared to the Saxa variety. On the other hand, the " Large Reds" variety has from 12.9% to 23.7% higher average yield in all fertilizing options compared to the control, and in the Saxa variety from 7.3% to 13.2%. In scattered sowing, the highest yield was reported when fertilizing with Italpolina of 8718 connections/dec in the " Large Reds" variety and 6918 connections/dec in the Saxa variety.The influence of biological fertilization in row sowing is more pronounced and has been proven statistically in both varieties and in all fertilization options. Row sowing gave a higher yield with 11.3% in both varieties. As with scattered sowing, the Edri red variety has a 15.9% to 24.9% higher yield with all fertilization options. The highest productivity was obtained for variant fertilizing with Italpolina in the " Large Reds" variety 9950 bunch/ha-1 and in the Saxa variety 8906 bunch/ha-1.Organic fertilizers did not lead to the accumulation of excessive amounts of nitrates in both varieties, but varietal differentiation was confirmed. In scattered sowing, they were from 1118.4 mg/kg to 1407.3 mg/kg in the Saxa variety and in " Large Reds" from 1023.7 mg/kg to 1131.4 mg/kg. Nitrates in row sowing are lower and vary from 969.7 mg/kg to 1051.8 mg/kg for "Large Reds" variety and for Saxa from 1118.4 mg/kg to 1407.3 mg/kg.

Key words*: radishes, greenhouses, organic fertilization, nitrate.*

PHYSICO-CHEMICAL CHARACTERISTICS OF PUMPKIN FRUITS (*CUCURBITA MAXIMA* DUCH.) CULTIVATED ON SANDY SOILS AT DĂBULENI RDSPCS

Felicia FRĂTUȚU, Ștefan NANU, Loredana SFÎRLOAGĂ[1], Diana ILINA[1]

Dăbuleni Research-Development Station for Plant Culture on Sands, Călărași, Dolj County, Romania

Corresponding author email: nanu.st@scdcpndabuleni

Abstract

The edible pumpkin is grown for its fruits, which can be consumed riped, boiled, or candied. In Romania, the pumpkin culture has recently started attracting the growers attention. In this context, at the Dăbuleni research station, six pumpkins (three cultivars `Marele alb`, `Coroana Prințului`, `Tudor`, and three genotypes D19, P1, P2) were studied to analyze their nutritional potential. Observations regarding the physical characteristics of the fruits (height, diameter, and weight of the fruit, diameter of the fruit cavity, shape index, and pulp thickness) were analyzed, as well as observations regarding the food quality (soluble dry matter, total dry matter, malic acid, carbohydrates, vitamin C). The thickness of the fruit pulp varied between 3.30 cm for `Tudor` and 4.50 cm for the `Coroana Prințului` cultivars, and the fruit weight varied between 3.16 kg (P2) and 8.20 kg for the `Marele Alb`. A content in soluble dry matter of more than 11% was presented at the `Marele alb`, P2, and D19.

Key words*: pumpkin, morphometric characteristics, biochemical characteristics, sandy soils.*

DROUGHT STRESS AND THE ROLE OF SALICYLIC ACID IN RELIEVING THE OXIDATIVE DAMAGE AT TOMATO PLANTS

Gabriel-Alin IOSOB, Tina Oana CRISTEA, Dan Ioan AVASILOAIEI, Alexandru BUTE, Sebastian Petru MUSCALU

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

Corresponding author email: tinaoana@yahoo.com

Abstract

Our study was accomplished in lab conditions at Vegetables Research and Development Station Bacău, aiming to determine the impact of foliar treatment with salicylic acid (SA) over the ability of plants to overcame the water stress. The pot experiment used a randomized block design with four replications and ten plants per variant. Leaves from well-developed plants (30 days old seedlings) were sprayed with 1mM SA solution until both sides were completely moistened. After treatment application, water regime followed as one set was used as a well-water treatment (WW) and the other set as a drought stress treatment (DS) where the plants were restricted watering for the next 10 days. Results showed that tomato plants treated with salicylic acid and exposed to water stress become more tolerant to drought stress induced oxidative damage than those not treated, the values were comparable to those recorded in WW plants. The extent of water stress injury was higher at non-treated DS plants. The results obtained showed that foliar application of SA stimulated the adaptation of plants, improving water-plant relation, allowing to alleviate the oxidative damage.

Key words*: plant growth, stimulating growth, stress factors, VRDS Bacău.*

STUDY REGARDING THE INFLUENCE OF SOME CLIMATIC PARAMETERS IN THE GREENHOUSE ON TOMATO PRODUCTION

Ionuţ Ovidiu JERCA

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

Corresponding author email: draghiciem@yahoo.com

Abstract

The study was conducted under controlled conditions in a greenhouse during an autumn-spring tomato harvest cycle. The culture was carried out in an unconventional system, on coconut substrate. All environmental factors were recorded and correlations were made with all vegetation parameters. The cultivar Cheramy F1 was used. At planting, the seedling was 40 days old, a height between 38-43 cm and a number of 6.33 true leaves. The planting was carried out directly on the culture substrate after its prior moistening. Differences in growth rate were noted depending on the temperature in the culture space. The aim of the study was to analyze the influence of some growth and fruiting parameters on the total production and its quality.

Key words*: soilless, tomatoes, cherries, Cheramy F1.*

VEGETABLES CROPS NUTRITION MANAGEMENT USING DRIP FERTIGATION AND SHADING MESH

Mykola KHARYTONOV[1], Mykhailo BABENKO[2], SvitlanaLEMISHKO[1], Larisa SHUPRANOVA[2], Yelizaveta CHERNYSH[3, 4], Hynek ROUBIK[4]

[1]Dnipro State Agrarian and Economic University, 25 Serhii Yefremov Street, 49005, Dnipro, Ukraine
[2]Dnipro National University, 72 Gagarin Avenue, 49010, Dnipro, Ukraine
[3]Sumy State University, 2 Mykola Sumtsova, Sumy, Ukraine
[4]Czech University of Life Sciences, 129 Kamycka Street, 16500 Prague, Czech Republic

Corresponding author email: kharytonov.m.m@dsau.dp.ua

Abstract

The main objective of our case study was related to a comparative assessment of chemical and organic fertilizers on yield and quality of vegetables in arid conditions. The highest yield of two pepper hybrids was fixed in the trial fertigated with liquid digestate fraction and equipped with sunlight protective mesh.
The fresh red tomato yield was highest after foliar spraying treatment with vermicompost tea (6.95kg/m^2) and carbamide (7.23 kg/m^2) in the second field experiment. The relative additional yield of aubergine fruits (11.6-12.1%) and pepper (12.0-12.7%) was higher in case of drip fertigation. The aubergine fruits have a high peroxidase activity. The high activity of peroxidase was especially observed in fruits when using vermicompost tea. The use of drip fertigation proved to be a more efficient operation of the peroxidase system in pepper fruits compared to foliar spraying. The study of molecular forms of peroxidase in tomato seeds showed their small number (six components) and variability of expression under different growing conditions. Significant inhibition of isoperoxidase activity was observed in carbamide treatment after foliar spraying of tomato plants.

Key words*: digestate, drip fertigation, shading mesh, vegetables crops, vermicomposting tea.*

DESCRIPTION OF THE MORPHOLOGICAL CHARACTERISTICS OF SOME TOMATO GENOTYPES

Gülbanu KıYMACı[1], Önder TüRKMEN[2], Ayşe özgür UNCU[3]

[1]Selçuk University, Konya/Türkiye, Selcuklu, Turkey
[2]Horticulture Department of Agriculture Faculty, Konya/Turkey, Selcuklu, Turkey
[3]Faculty of Science, Department of Biotechnology, Konya/Turkey, Meram, Turkey

Corresponding author email: gulbanu.kiymaci96@gmail.com

Abstract

This study was carried out in order to determine some morphological characteristics of 240 tomato genotypes at S2 level and to demonstrate the usability of these materials in breeding programs. Accordingly, the average fruit weight was between 553.11 g and 74.83 g. The mean pericarp thickness, carpel number, and soluble dry matter content of the genotypes were 7.38 mm, 3.6 pieces and 4.04% brix, respectively. Based on these measurements and observations, tomato genotypes were also investigated using the Cluster and Principal Component Analysis (PCA) methods. According to the PCA results, the first component explained 24.1% of the total variance, and the number of fruit carpels, average fruit weight, and fruit width were the most highly explained parameters. The second and third main components constituted 13.06% and 11.16% of the total. Based on the results of fruit characterization studies, genotypes 233, 447, 126, 22, 391, 118, 71, 100, 340, 102 were determined as superior. Overall, A high degree of morphological variation was detected among the characterized tomato genotypes.

Key words*: Key words: tomato, morphology, PCA.*

ONION STEMPHILIOSIS IN SOUTHERN UKRAINE

Yurii KLECHKOVSKYI[1], Sergi KORLIUK[2], Nicolay MOHYLIUK[3], Elena SHMATKOVSKAIA[4], H. KHOROKHORYNA[5]

[1]Quarantine Station of Grape and Fruit Cultures of Plant Protection Institute NAAS of Ukraine, 49 Fontanskaya road, Odesa, Ukraine
[2]State Institution "Odessa Regional Phytosanitary Laboratory" 76/1 A.Williams Str., Odessa, Ukraine 65104, office@lab.gov.ua

Corresponding author email: oskvpk@te.net.ua

Abstract

Stemphiliosis of onion is a relatively new disease in Ukraine. The disease appears in the form of oblong spots on the leaves and causes premature leaf death. The aim of the work is to propose means of protection for control of onion stemphyliosis based on the study of the pathocenosis species composition, biophenology of the disease agent of onion stemphyliosis and determination of the fungicides efficiency. Field studies were carried out on plantings of onion variety Banco in the farm AF "Petrodolynske" Odessa district, Odessa region of Ukraine in 2019-2021. We identified the causative agents of onion stemphyliosis - Stemphylium vesicarium (Wallr.) Simm, Stemphylium botryosum Wallr, Stemphylium herbarum Simm. which had different frequency of occurrence in the samples. The preparations with the following active substances were found to control the disease most effectively under field conditions: fluopyram (200 g/l) + tebuconazole (200 g/l) and fluoxastrobin (100 g/l) + prothioconazole (100 g/l).

Key words*: onion, phytosanitary monitoring, Stemphylium vesicarium, fungicides.*

IDENTIFICATION OF ALTERNATIVE MEASURES FOR THE MANAGEMENT OF ROOT-KNOT NEMATODES ON SOLANACEOUS VEGETABLE CROPS IN SOUTHWEST BULGARIA

Lilyana KOLEVA, Georgi DIMITROV, Zhelyu AVRAMOV

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

Corresponding author email: lmarkova@ltu.bg

Abstract

Vegetables from the Solanaceae family (eggplant, tomato, and potato) are among the crops in Europe which in terms of production rank first, and in Bulgaria their production is concentrated in the south-western part. The aim of the study was to identify alternative root-knot nematode control measures applicable in integrated pest management to improve plant health and reduce dependence on chemical pesticides in Solanaceae vegetable production. Based on the data of new research, a summary list of specific combinations of vegetable crops/species of root-knot nematodes in Bulgaria has been compiled. After analysing the problems and according to the innovative practices, methods to control a given root-knot nematode species in a certain crop were indicated. The studies enabled an inventory of potential alternative measures for integrated management and the creation of a dataset that will allow for the improvement of plant health and the reduction of dependence on chemical pesticides in the production of Solanaceae vegetables.

Key words*: alternative measures, root-knot nematodes, Solanaceae vegetable.*

PRODUCTIVITY AND NITRATE CONTENT OF GREENHOUSE SPINACH GROWN WITH ORGANIC FERTILIZATION

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

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

Corresponding author email: kostadinov8888@gmail.com

Abstract

In an experiment with spinach grown in unheated polyethylene greenhouses, three organic fertilizers (Italpolina, Biosol and Vita Organic) were tested at three different doses. Regular and scattered sowing was applied. Productivity expressed as yield per hectare for all three tested organic fertilizers increases with increasing fertilization dose. The highest yield of 2936 kg/da for row sowing and 2401 kg/da for scattered sowing was reported after fertilization with Italpolina at the maximum application rate of 105 kg/da. Row sowing produces a higher yield than scattered sowing. The lowest content of nitrates is when fertilizing with Biosol at a dose of 210 kg/day - respectively 988.6 mg/kg for regular sowing and 1,370.2 mg/kg for scattered sowing.

Kay words: *spinach, plastic greenhouses, organic fertilization, productivity, nitrate content.*

ASSESSMENT OF CHEMICAL HAZARDS PRESENT IN TOMATOES FROM CONVENTIONAL AND ORGANIC CROPS IN CÔTE D`IVOIRE

Kohi Alfred KOUAME

Nangui Abrogoua University, 2250709994291,
Abidjan, Ivory Coast (Cote D`Ivoire)

Corresponding author email: kohialfred2@yahoo.fr

Abstract

The use of fertilizers in agriculture can be a source of contamination of fruits and vegetables. This study aims to evaluate the metallic contamination of tomatoes from organic and conventional market gardens produced in Côte d`Ivoire. Specifically, the evaluation concerned the contamination by heavy metals used intensively by the producers for the fertilization of market gardening crops. Four heavy metals (mercury, lead, cadmium and arsenic) were investigated in tomato samples from these two types of agriculture. The average levels of mercury in the organic tomato (0.08290 ± 0.03 mg/kg), and in the conventional tomato (0.1564 ± 0.1 mg/kg), respectively exceed the maximum limits (EC N 1881/2006). However, in the organic tomato, only the mercury levels exceeded the required standards, the other heavy metals were in trace amounts. While the content of these other metals in the organic tomatoes exceeded the standard. The consumption of these tomatoes could present a health risk for the consumer.

Key words*: organic agriculture, conventional agriculture, heavy metals, dietary exposure.*

ASSESSMENT OF TECHNOLOGICAL APPROACHES FOR TOMATO PRODUCTION BASED ON MATHEMATICAL-STATISTICAL ANALYSIS

Velika KUNEVA, Nikolina SHOPOVA, Manol DALLEV, Georgi KOMITOV, Dimitar RAZPOPOV, Galya HRISTOVA

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

Corresponding author email: manol_dallev@abv.bg

Abstract

The production areas with vegetables in our country are increasingly beginning to decrease. This reduction is due to the permanent increase in the price of fertilizers and preparations and the reduction of the workforce. The article presents real data from the production process of tomatoes grown according to the direction - late Polish production, using several different technological approaches. The aim of the present development is to evaluate the technologies by using a mathematical apparatus - dispersion and regression analysis. The obtained results are adequate and easy to interpret, they reflect the entire process, but they are valid only under the specific conditions. However, it can be clearly delineated that the use of herbicides, during the growing season, significantly reduces the cost of tomato production.

Key words*: tomato, technology for production, herbicides, dispersion and regresion analysis.*

INFLUENCE OF ESSENTIAL OIL SPEARMINT (*MENTHA SPICATA* L.) CULTURE ON SOIL BIOGENICITY AND DETERMINATION OF ITS ANTIMICROBIAL ACTIVITY AGAINST *ESCHERICHIA COLI*

Boyka MALCHEVA[1], Pavlina NASKOVA[2], Dragomir PLAMENOV[2], Dimitar NIKOLOV[3]

[1]University of Forestry, 10 Kliment Ohridski Blvd, Sofia, Bulgaria
[2]Technical University - Varna, 1 Studentska Str., Sofia, Bulgaria
[3]General Toshevo Municipality - chief architect, 5 V. April Str., General Toshevo, Bulgaria

Corresponding author email: boika.malcheva@gmail.com

Abstract

Soil microbiological and agrochemical indicators were analyzed during biological cultivation of spearmint, in greenhouse conditions, as main indicators of good plant development, studied for antimicrobial activity against Escherichia coli, by testing different variants of plant extracts (decoction, tincture, medicinal wine, medicinal vinegar, medicinal oil). The results of the agrochemical analysis show that spearmint does not have a major impact on the dynamics of macronutrients in the soil. While the biogenicity and activity of enzymes cellulase and catalase increased in the soils with spearmint culture compared to the no-vegetation control. Positive antimicrobial activity against the pathogenic microorganism Escherichia coli was reported for all variants of extracts of spearmint, differing for individual parts of the plant and individual variants of extracts. Root and whole plant extracts showed higher antimicrobial activity compared to leaf and stem extracts. The strongest antimicrobial activity of the plant extracts was found in the medicated oil and medicated vinegar variants and the weakest in the `decoction` variants. The choice of solvent and exposure time likely influence the diameter of the sterile zone.

Key words*: spearmint, soil microorganisms, cellulase, catalase, antimicrobial activity.*

STUDY ON THE INFLUENCE OF NUTRIENT CONDITIONS ON THE PRODUCTION AND QUALITY OF LETTUCE GROWN ON PERLIT SUBSTRATE

Daniela MICU (BALINT), Elena Maria DRĂGHICI

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

Corresponding author email: draghiciem@yahoo.com

Abstract

The study was carried out in the research greenhouse, within the Horticultural Products Quality Research Center in 2022. On the mattresses filled with perlite, 2 varieties of lettuce were grown, oak leaf type, Kineta type, and Lollo Bionda type, variety Lugano. The nutrient solution was administered in 3 EC concentrations, respectively 1.5 mS, 2.5 mS and 3.5 mS. Three pH levels were used for each EC type. Differences were found between the experimental variants regarding the reaction of the varieties to these treatments. The aim of the study was to see the influence of nutrient solution concentration on some production and quality parameters of lettuce grown on perlite substrate.

Key words*: lettuce, soilless, perlite, substrate.*

THE ROLE OF THE PARENTAL FACTOR IN THE MANIFESTATION OF GROWTH AND DEVELOPMENT TRAITS AT THE F_1 TOMATO HYBRIDS

Nadejda MIHNEA, Galina LUPAŞCU, Diana BRAŞOVEANU

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

Corresponding author email: mihneanadea@yahoo.com

Abstract

The paper presents the results of assessing the resistance of some parent varieties and reciprocal F_1 combinations of tomatoes to stressful (40º, 42ºC) and optimal (25ºC) temperatures. The analysis of the variability of the resistance character was carried out based on the length of the embryonic radicle, stem and whole seedling. In most of the cases stressful temperatures produced significant inhibition of growth organs. The differences in the manifestation of the analyzed characters in the reciprocal F_1 hybrids both in the control variant and in the variants with stressful temperatures demonstrate the involvement of the parental factor in their phenotype on the background of different temperatures. The maternal effect was more pronounced at the temperature of 42ºC than under optimal conditions. Manifesting of the parental entity effect on the degree and orientation of dominance reveals its influence on the allelic interactions of the F_1 heterozygous genotype. The overdominance in relation to the best parent indicates that the parental entity intensifies the influence of the recessive alleles on those dominant, involved in the control of growth characters of tomato plants.

Key words: *tomato, temperature, variability, parental effect, dominance.*

EFFECT OF INTERCROPPING ON THE GROWTH AND YIELD OF CABBAGE

Gergana MLADENOVA, Milena YORDANOVA

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

Corresponding author email: yordanova_m@yahoo.com

Abstract

The aim of the research was to test how different plant species affect the growth and yield of cabbage when they are intercropped. The experiment was carried out in the experimental field of the University of Forestry - Sofia, in 2022. Five combinations were selected: cabbage+leek, cabbage+green beans, cabbage+dill, cabbage+tagetes, cabbage+Weleda seed mix, which were compared cabbage as sole crop. The seedlings of cabbage were planted in the period 25-29.07.2022 on the block method with four replications. The other crops were sown or planted at the same period. Compared to intercropping, sole crop cabbage has a smaller height and diameter of the product part. With the highest weight per cabbage is the combination of cabbage + green bean, while the lowest is the cabbage + Weleda seed mix, followed by cabbage + dill.

Key words*: biometry, cabbage, green bean, intercropping, yield.*

PRELIMINARY RESULTS OF FERTILIZERS DERIVED FROM AQUACULTURE EFFECT ON LETTUCE

Ailin MOLOŞAG[1], Violeta Alexandra ION[1], Oana Cristina PÂRVULESCU[2], Aurora DOBRIN[1], Oana Crina BUJOR[1], Mihai FRÎNCU[1], Andrei PETRE[1], Liliana BĂDULESCU[1], Viorica LAGUNOVSCHI-LUCHIAN[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania
[2]University POLITEHNICA of Bucharest, 1-7 Gheorghe Polizu Str., Bucharest, Romania

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

Abstract

In an attempt to respond to the latest environmental and pollution challenges, combined with the need for food for a progressively growing population, this study proposes an alternative way to increase food production, by testing aquaculture-based bioeconomy products for farming and agricultural potential use. For this purpose, the experimental framework consisted in establishing by seedling a greenhouse potted lettuce crop with 'Simona' curly variety. Four experimental variants were considered, two of which consisted of organic fertilization treatments with fish residues, i.e., cod bone powder (F1) and common ling powder (F2), one of chemical fertilizer (F3), and a control group (C). The experimental monitoring period was set from 14/11/2022 to 04/01/2023 and the lettuce crop was evaluated in terms of leaf number, leaf nutrient content, and yield. The variants F1 and F2 performed similar to variant F3, but better than variant C. Consequently, fish-derived organic fertilizers could be an effective alternative to chemical fertilizers for greenhouse-grown lettuce.

Key words*: greenhouse, lettuce, fertilizers, blue bioeconomy.*

ESTIMATION OF CHLOROPHYLL CONTENT AND DETERMINATION OF CHLOROPHYLL FLUORESCENCE IN BITTER CUCUMBER (*MOMORDICA CHARANTIA* L.) LEAVES UNDER SALINE STRESS CONDITIONS

Ștefănica OSTACI, Mihaela COVAȘĂ, Cristina SLABU, Alina Elena MARTA, Carmen Doina JITĂREANU

"Ion Ionescu de la Brad" Iaşi University of Life Sciences,
Mihail Sadoveanu Alley, no. 3, 700490, Iaşi, Romania

Corresponding author email: stefanaostaci@gmail.com

Abstract

It has been scientifically proven that one of the physiological processes most affected by salt stress is photosynthesis. In this context, it is important to identify the main mechanisms involved in increasing plant tolerance to salt stress. The photosynthetic intensity is directly related to the productive capacity of plant species, thus increasing the tolerance of plants to saline stress is a priority. The chlorophyll content and chlorophyll fluorescence were studied in two varieties (Rodeo and Brâncuși) and three lines (Line 1, Line 3 and Line 4) of bitter cucumber (Momordica charantia), subjected to salt stress. Following the determinations, a higher concentration of chlorophyll was estimated in the control plants of the Brâncuşi variety and Line 4, in contrast to the Rodeo variety, Line 3 and Line 1. In the case of this variety and the two lines, the plants treated with the highest concentration of saline solution prepared by using sodium chloride (NaCl) (200 mM) shows a higher concentration of total chlorophyll content. During the treatments, the fluorescence was higher in the treated plants compared to the control plants.

Key words*: bitter cucumber, salt stress, chlorophyll, fluorescence.*

EVALUATION OF THE VIABILITY OF CAPE GOOSEBERRY (*PHYSALIS PERUVIANA* L.) SEEDS AFTER LONG-TERM STORAGE

Nikolay PANAYOTOV

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

Corresponding author email: nikpan@au-plovdiv.bg

Abstract

The main objective of the present study was to determine the vitality status and the possibility of preserving the quality of cape gooseberry (Physalis peruviana L.) seeds after long-term storage. The experiments were carried out in the Department of Horticulture at the Agricultural University-Plovdiv, Bulgaria, with seeds from Plovdiv variety and from genotype Obrazec 1, harvested in 2013 and stored for ten years, under ambient conditions. In the stage of full botanical maturity the seed were extracted and qualified. Germination energy, germination, mean germination time, uniformity of germination, germination rate, 50% seed germination, seedling morphology and vigor etc. were determined. These signs were examined every year to the ten years of storage. Good preservation have observed up to 6 years of storage, with germination remaining above 70%. A strong positive correlation was determined between the length of the embryo root and hypocotyls with the fresh weight of the seedlings, r = 0.72 and r = 0.80, respectively. A linear regression was found between storage duration and germination energy and germination, with high coefficients of determination R2 = 0.86 and R2 = 0.81, respectively.

Key words*: storability, sowing quality, germination, vigour, seeds.*

RESEARCH ON THE DYNAMICS OF METEOROLOGICAL PHENOMENA IN THE SOUTH OF OLTENIA AND THE ESTABLISHMENT OF THE SUITABILITY OF THE SWEET PEPPER CULTURE FOR THE CURRENT CLIMATIC CONDITIONS

Alina-Nicoleta PARASCHIV[1], Aurelia DIACONU[1], Ștefan NANU[1], Daniela Valentina POPA[2]

[1]Dăbuleni Research-Development Station for Plant Culture on Sands, Călărași, Dolj County, Romania
[2]University of Craiova, Faculty of Horticulture, 13 A.I. Cuza Street, Craiova, Romania

Corresponding author email: alina22paraschiv@yahoo.com

Abstract

In order to highlight the amplitude of climate changes in the southwest of Romania, at Dăbuleni Research - Development Station for Plant Culture on Sands (SCDCPN Dăbuleni), the climatic data from the archives of the own meteorological station were analyzed and processed over a period of 65 years. The dynamics of meteorological phenomena in the period 1956-2020 was analyzed, a sufficiently long period for a meaningful analysis and correct conclusions. Data processing from the 780 months and more than 23,400 data records was the source of our conclusions. Helman`s criterion was used to determine the types of thermal and pluviometric time, and as normal climatic averages the averages of the measurements of the climatic parameters of the 65 years were used, the period being significantly extended. The thermal norm in the Dăbuleni area is much higher than in most of Oltenia with monthly summer averages between 21.6°C in June, 23.6°C in July and 23.0°C in August, and the seasonal average summer of 22.8°C. Summer heat produces staged forcing of the sweet pepper crop and early and massive ripening.

Key words*: climate change, temperature, precipitation, sweet pepper.*

EVALUATION THE SWISS CHARD RESPONSE TO BIOCHAR APPLICATION

Vera PETROVA[1], Ivanka MITOVA[2]

[1]University of Forestry, Faculty of Agronomy, 10 Kliment Ohridski Blvd, Sofia, Bulgaria
[2]ISSAPP "Nikola Poushkarov" - Sofia 1000, Bulgaria

Corresponding author email: vera_zamfirova@abv.bg

Abstract

A study was made to determine the influence of incorporate carbonized plant residues, as a soil improver, on the growth and development of Swiss chard (Beta vulgaris subsp. vulgaris). A pot experiment was conduct on two soil types: Vertisols and Luvisol soils. Five variants were develop in three replicates, as follow: 1. Control – pure soil without fertilization; 2. Soil + biochar (BC); 3.BC+$N_{200}P_{200}K_{250}$; 4.BC+$N_{400}P_{200}K_{250}$; 5.BC+$N_{600}P_{200}K_{250}$ and the same variants (6,7,8,9,10)on Luvisol. Irrespective of the different starting supply of nutrients in two soil types, the highest yield of plant mass was recorded in the variant with BC+$N_{200}P_{200}K_{250}$, followed by the variant with BC+$N_{400}P_{200}K_{250}$. The fresh mass recorded on Vertisol significantly exceeds that on Luvisol.

Key words: *Swiss chard, fertilizer, biochar, pot experiment.*

IMPACT OF DIFFERENT IRRIGATION REGIMES ON CABBAGE GROWTH

Vera PETROVA, Viktor BICHEV

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

Corresponding author email: vera_zamfirova@abv.bg

Abstract

Water is essential for agricultural production and food security. At present and in the future, irrigation will be carry out in condition of water shortage. The field experiments were carry out in 2022 on the Experimental Field of the University of Forestry, located in the Sofia Field, near Vrajdebna village. The soil type is alluvial - meadow with light mechanical composition. The growing crop is a late season cabbage variety Balkan which is the standard variety for Bulgaria. Six variants of irrigation regime was tested, as follow 130%, 100%, 70%, 40% of irrigation rate, without first irrigation during the development stage and without second irrigation during the head formation. Climate, soil moisture, biometric data and yield was measure. The data show the greatest yield in variants without second irrigation. Furthermore, the results show that early drought stress effects can be compensate by an appropriate water supply in later growing stages.

Key words: *irrigation regime, drought stress, drip irrigation.*

APPLICATIONS OF SALICYLIC ACID ON SEEDS AND SEEDLINGS OF PEPPERS UNDER SALINITY CONDITIONS

Vedat PİRİNÇ, Erhan AKALP

Dicle University Faculty of Agriculture, Sur, Diyarbakir, Türkiye

Corresponding author email: vedatpir@gmail.com

Abstract

As a result of the global drought, improper irrigation and excessive fertilizer applications; salt accumulation in agricultural lands can cause production to stop. It is not possible to wash the soil in large lands and it is a difficult practice to rehabilitate the salty soils formed. In order to regain these soils for production, researchers have different applications; rotation and fallow practices, different irrigation methods, using of fertilizers and plant growth regulators etc. can be performed. In addition, with the changing and developing technologies, studies on production models that are not dependent on soil (soilless farming, rapid plant cultivation with LED lights in different aggregate cultures in artificially controlled environments) are being made on new models every day. This study was carried out to determine the effect of salicylic acid applications on pepper seeds and seedlings in saline conditions. Çermik pepper genotype, which is a local variety belonging to Diyarbakir, was used as plant material. Commercial rock salt was used as NaCl. While the pepper seeds were treated by keeping in 0.1mM and 0.5mM salicylic acid solution dosages, the seedlings were treated in pots containing the same doses of water culture + Hoagland nutritional solution. In order to identify the physiological and morphological changes in control and subjected to treatment plants, Chlorophyll-a, Chlorophyll-b, Total Chlorophyll content, Caretonoid content, 0-5 damage index of plants, plant fresh and dry weight (without roots), root fresh weight, plant fresh weight, leaf fresh weight, root length, stem length and stem diameter values were measured at the end of the research. When the statistical data obtained at the end of the study were examined, it was determined that both doses of Salicylic Acid increased the resistance of the plant to NaCl compared to the untreated seedlings. Furthermore, it has been determined that the application of 0.1 and 0.5 mM doses of salicylic acid to the seeds and the subsequent application of SA to these seeds increases the resistance to NaCl that will be given to the environment.

Key words*: salicylic acid, salinity, pepper, seed, seedling.*

STUDY ON THE EFFECT OF ACTIVATED CHARCOAL IN STIMULATING *IN VITRO* RHIZOGENESIS OF SWEET POTATO PLANTLETS

Monica POPA[1, 2], Mihaela CIOLOCĂ[1], Andreea TICAN[1], Valentina ȘERBAN[1]

[1]National Institute of Research and Development for Potato and Sugar Beet Brasov, 2 Fundaturii Street, Brasov, Romania
[2]Doctoral School of Agriculture Engineering, University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, 119 Calea Aradului Street, Cluj-Napoca, Romania

Corresponding author email: mihaela.cioloca@potato.ro

Abstract

Activated charcoal is recommended to be added to nutrient media, used in crops of plant tissues, to the growth and development of some types of explants, but also its role of absorbing toxic compounds present in aseptic environments, which cause necrosis of inoculated tissues. . The main purpose of this study was to assess the influence of three concentrations of activated carbon (0.5 g/l, 1 g/l, 2 g/l) added to the MS culture medium, on the formation and root development of two varieties of sweet potato (DK 19/1 and DK 19/5). A bifactorial experience was initiated, the analyzed factors being: variety and culture environment. Determinations were made on the following parameters: root length, fresh root weight and dry root weight. Based on the obtained results, an optimal rooting was observed, without callus formation, ensuring a higher percentage of capacity at acclimatization of sweet potato seedlings from in vitro to in vivo.

Key words*: sweet potato, plant tissue cultures, activated charcoal, rhizogenesis.*

ANALYSIS OF THE DIVERSITY OF GARLIC (*ALLIUM SATIVUM* L.) GENOTYPES FROM THE SOUTHWESTERN PART OF ROMANIA BASED ON MORPHOLOGICAL CHARACTERISTICS

Patricia Maria POPA[1], Sina Niculina COSMULESCU[2], Maria DINU[2]

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

Corresponding author email: patricia.popi@yahoo.ro

Abstract

Garlic (Allium sativum L.) is a plant species with asexual reproduction, but also with high genetic diversity. This specialized paper aims to analyse the diversity of garlic genotypes (34) identified in the southwestern part of Romania, genetic diversity based on morphological characteristics. The observations were made on morphological features, according to the standard descriptors for garlic developed by IPGRI 2001. The analysis of the variability of some morphological characteristics (7) indicated a high variability: for bulb height, the average values ranged between 1.76 cm (OT31) and 5.16 cm (CR1); for bulb diameter, the limits of variation were from 1.60 cm (CZ17) to 6.5 cm (IZ2); for the number of cloves/bulb values are between 18.8 cloves/bulb (DN34) și 6 cloves/bulb (DG11). The 34 genotypes, identified in the south area, of selected garlic, possess important morpho-quantitative and morpho-agronomic characters, some values exceeding those recorded by the control cultivar. These genotypes are valuable in terms of biological diversity, over the years adapting to environmental factors specific to the area of cultivation and will be the subject of the following studies to determine the behaviour in culture.

Key words*: garlic, genotypes, variability.*

INFLUENCE OF EXPOSURE OF OKRA SEEDS TO A VARIABLE MAGNETIC FIELD ON GERMINATION

Adrian RĂCHIERU, Elena Maria DRĂGHICI

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

Corresponding author email: draghiciem@yahoo.com

Abstract

The study was carried out at the Faculty of Horticulture in Bucharest and two varieties of okra, Acme and Ela, were used. The experimental variants were: V1 moistened seeds, V2 – non-moistened seeds; V3 and V4 unmoistened and moistened seeds exposed to 10 Hz fields; V5 and V6 – moistened and non-moistened seeds exposed to the 6.8 kHz field; V7, V8 V9 and V10 unmoistened and moistened seeds exposed to 10Hz and 6.8 kHz fields for 2 hours, and in V11-V14 unmoistened and moistened seeds also exposed to 10Hz and 6.8 kHz fields for 24 hours. Differences in emergence time were noted, the best time was recorded for the moistened variants exposed to magnetic fields Acknowledgments The work of Rachieru Adrian as suported by the project Proinvent, Contract no. 62487/03.06 -POCU/993/6/13-code 153299, financed by The Human Capital Operational Programe 2014-2020 (POCU), Romania.

Key words*: okra, seed, magnetic field, germinations.*

STUDY REGARDING THE INFLUENCE OF ENVIRONMENTAL CONDITIONS ON SOME GROWTH PARAMETERS OF OKRA PLANTS

Adrian RĂCHIERU, Elena Maria DRĂGHICI

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

Corresponding author email: draghiciem@yahoo.com

Abstract

The study was carried out in 2022 on the okra crop, the Smaranda and Adela varieties, tracking the production capacity depending on the climatic conditions. It was noted that the very high temperature during the growing period had a significant influence on production. High temperatures in the first growth period, as well as very low atmospheric humidity, had a great influence on plant development. It was found that the Adela variety presented a lower vegetative growth compared to the Smaranda variety. Acknowledgments The work of Rachieru Adrian was suported by the project Proinvent, Contract no. 62487/03.06 -POCU/993/6/13-code 153299, financed by The Human Capital Operational Programe 2014-2020 (POCU), Romania.

Key words*: okra, production, climatic conditions.*

PLANTING TIME EFFECT 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 tomatoes, grown in conditions of late field production. The experiments were carried out during the period 2020 - 2021 in the experimental field, Department of Horticulture at Agricultural University - Plovdiv, with cultivar Opal F_1. The opportunity of growing and fruiting of plants was evaluated by planting on three dates through 15 days (20th June, 5th, and 20th July). During the growing season, plant height (cm), leaf area (cm^2), first flowering and first fruiting, fruit set, and yield (kg/da), were recorded. The planting time has effects on the growth and yield of tomatoes. The better performance of tomato plants was observed planting on the 20th of June as the plants fall into climatic conditions near optimal for the crop, which affects the vegetative and generative growth of plants and increases the total yield.

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

STUDY ON THE EVOLUTION OF THE RANGE OF VARIETIES AND HYBRIDS OF TOMATOES CULTIVATED IN ROMANIA

Claudia SIMIONESCU, Elena Maria DRĂGHICI

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

Corresponding author email: draghiciem@yahoo.com

Abstract

The study was carried out at USAMV Bucharest, within the doctoral courses, and aimed to identify the assortment of tomato varieties and hybrids grown in protected areas and open fields in Romania. Tomatoes are traditional vegetables, rich in carbohydrates, vitamins, lycopene and carotene. Currently, imported F1 hybrids, extra-early and early and Romanian and imported varieties are grown in particular in a small proportion. F1 hybrids are preferred, it can show the phenomenon of heterosis which gives crops resistance/tolerance to diseases, pests, drought, a higher yield and a very good quality of fruit production. F1 tomato hybrid seeds are procured from vegetable growers from authorized stores that import them to production companies from the Netherlands, Italy, France, Israel. The Romanian tomato seeds come from research stations in Buzău, Bacău, Vidra, etc These studies show the large assortment of tomato cultivars used and adapted in the vegetable areas of Romania and recommended for conventional and non-conventional cultivation technologies in greenhouses, solar and field.

Key words*: field, F1 hybrids, cultivars, Solanum lycopersicon, protected space.*

EFFECT OF BIOFERTILIZERS ON QUALITY OF SWEET CORN

Rodica SOARE[1], Maria DINU[2], Cristina BĂBEANU[3]

[1]University of Craiova, Faculty of Agriculture, Libertatii Street, No. 19, Craiova, 200333, Romania
[2]University of Craiova, Faculty of Horticulture, Department of Horticulture and Food Science, 13 A.I. Cuza Street, 200858, Craiova, Romania
[3]University of Craiova, Faculty of Science, Department of Chemistry, 13 A.I. Cuza Street, 200858, Craiova, Romania

Corresponding author email: cbabeanu@yahoo.com

Abstract

Paper presents the effect of the Panoramix biofertilizer, whose composition consists of a combination of fungi (Trichoderma spp.) and bacteria (Bacillus spp.) on the quality of the edible part of sweet corn. The sweet corn crop was established in 2019, by sowing, and the seeds were treated with Panoramix, at a dose of 2 ml/kg seed. In this sense, two sweet corn hybrids were tested:`Basin $F_1$` and `Challenger $F_1$. The variants were organized as follows: `V_1- `Basin $F_1$`- untreated; V_2- `Basin $F_1$`- treated; V_3- `Challenger $F_1$`- untreated; V_4 - `Challenger $F_1$` - treated. The results regarding some the quality components, like TSS, reducing sugar, starch, carotene and antioxidant capacity confirmed the superiority of the application of the Panoramix biofertilizer compared to non-mycorrhizal variants. Among the tested hybrids, `Challenger $F_1$` recorded a better quality of sweet corn caryopses in the version treated with the micorryzal product. Based on the obtained results, it can be stated that the product Panoramix could be recommended as a promising sustainable approach to stimulate the quality of the sweet corn. Among the tested hybrids, `Challenger $F_1$` recorded a better quality of sweet corn caryopses in the version treated with the with the mycorrhizal product.

Key words*: Zea mays* var.*saccharata, mycorrhiza, production quality.*

STUDY REGARDING THE INFLUENCE OF DIFFERENT SOWING DATES ON THE PRODUCTION OF SOME *BRASSICA* SPECIES CULTIVATED IN NUTRIENT FILM TECHNIQUE (NFT)

Sovorn CHAN, Ovidiu Ionuț JERCA, Adnan ARSHAD, Elena Maria DRĂGHICI

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

Corresponding author emails: draghiciem@yahoo.com, chansovorn@gmail.com

Abstract

Brassicaceae or the mustard family is one of the popular crops which is cultivated in both open fields and protected culture. It is being used as an oil, condiment, or leafy vegetable type in many countries around the world, and in Asia, it is commonly used as a vegetable due to its nutritional value and health benefits. Usually, growing this type of crop is unpredicted with growth and yield because environmental factors such as temperature, light, humidity, etc might influence during cultivation. The study aimed to compare the growing condition of some Brassica species cultivated in the NFT system. The investigation took place throughout two growing cycles during distinct cultivating times at greenhouse in USAMV. We found the interaction between the variety and growing period in all observed except leaf width and number of leaves per plant.

Key words*: Brassica, species, growing condition, NFT,*

PRELIMINARY STUDY ON TWO LEAFY VEGETABLES GROWN IN DIFFERENT GROWING CONDITIONS IN NFT SYSTEM (*AMARANTHUS VIRIDIS* L., AND *BASELLA* RUBRA L.)

Sovorn CHAN, Ovidiu Ionuț JERCA, Adnan ARSHAD, Elena DOBRIN, Elena Maria DRĂGHICI

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

Corresponding author emails: chansovorn@gmail.com, draghiciem@yahoo.com

Abstract

Amaranth and Basella are widely used as leafy vegetables in some countries in Asia and Africa due to their nutritional value. These plants usually cultivate in temperate regions with strong sunlight, so the growth and yield might be restricted under certain conditions, such as cold and low sunlight intensity. The purpose of our study was to assess the specie of amaranth and basella grown in the NFT system at the greenhouse of the Research Center for Quality Control of Horticultural Produce, Faculty of Horticulture, USAMV. We found that amaranth grows well in natural light conditions, and the yield was doubled compared to LED red light. And basella cultivated in the NFT system gained more productivity and growth compared to cultivation in the pot.

Key words*: Amaranth, Basella, growing condition, NFT, LED, pot.*

DIVERSITY OF COMMON BEAN LANDRACES (*PHASEOLUS* SPP.) MAINTAINED IN HOME GARDENS IN BULGARIA

Tsvetelina STOILOVA, Petar CHAVDAROV

Institute of Plant Genetic Resources, 2 Drugba Str., Sadovo, Bulgaria

Corresponding author email: tz_st@abv.bg

Abstract

Dry bean is considered as one of the major legume crop with big number of landraces grown in Bulgaria. The aim of this study was to characterize landraces of Phaseolus spp. typically grown in home gardens. Studied plant materials were selected according to their importance and distribution, concerning traditions and culture for each region. The most popular local forms were characterized by different approaches. In this paper we will present results from morphological and agro-biological characterization, and phythopathological evaluation. During vegetation cycle of three consequences years 16 qualitative and quantitative traits were assessed on 55 accessions of Phaseolus spp. Phaseolus landraces showed high seed diversity, in terms of seed size, seed shape and seed color. Seed size was analyzed by 100 seed weight. Most of the studied accessions were scored with sensitive reaction to bacterial diseases (Xanthomonas campestris pv. Phaseoli) and only few accessions were identified with middle sensitive reaction.

Key words*: characterization, common bean, diversity, evaluation, local origin.*

SPECTRAL MANIPULATIONS TO CONTROL GROWTH AND QUALITY OF LETTUCE AND OTHER LEAFY GREENS IN VERTICAL FARMS

Yuxin TONG

Institute of Environment and Sustainable Development in Agriculture, Chinese Academy of Agricultural Sciences, Beijing, China

Corresponding author email: tongyuxin@caas.cn

Abstract

In vertical farms, selecting the most favorable light environment for plant growth is very important. One reason is that light, as a signal and energy source, is a vital driving force among the various factors those affect plant growth, development (photomorogenesis, photoperiodism, etc.) and nutritional quality (secondary metabolism), and the artificial light is the sole light source for plant growth. Another main reason is that energy consumed by lighting takes account of 60-80% of the total electric energy consumption in the vertical farms. Therefore, selecting the most optimum light environment for plant growth and development, and reducing light energy consumption are very essential for improving the running economic benefits of the vertical farms. Optimal light environment varies among species and even cultivars, plant growth stages, specific secondary metabolites, and other environmental conditions such as temperature, nutrients and CO2 concentrations. Different light qualities have distinctly different biological effects on plants, including plant growth, morphology, photochemical compounds, photosynthesis, organ growth, development and nutritional quality. Thus, the effects of spectral manipulations on plant growth, development and qualities are described in this presentation.

Key words*: light environment, photoperiodism, secondary metabolism.*

DIVERSITY OF COLLECTED LOCAL VARIETIES IN BULGARIA ASSESSED BY USING THE NATIONAL ELECTRONIC REGISTER OF PLANT GENETIC RESOURCES DATA

Nikolaya VELCHEVA

Agricultural Academy, Institute of Plant Genetic Resources,
2 Druzhba Str., Sadovo, Bulgaria

Corresponding author email: nikolaya_velcheva@abv.bg

Abstract

Before the globalization the local communities relied on the available traditional food plants for their nutritional and health-related needs. They remain neglected despite their huge biological value and potential. Recent literature reports that local food systems are more resilient, sustainable, and adaptive during times of climate changes, pandemics, and conflicts. It is important to follow research strategies to support their preservation and more widespread use in future. Significant plant gene fund and knowledge has been gained through conducted expeditions in Bulgaria. In this paper, the status of collected local diversity in Bulgarian genebank is explored based on documentation of accessions and the focus is on the needs of future development. The ex situ collection has been enriched with 10,883 local accessions from cereals, vegetables, pulses, medicinal and aromatic plants. Collected materials are listed in the electronic register according to descriptor of FAO/Bioversity. The results from inventory show that the country is rich in genetic biodiversity of vegetable crops and pulses, which requires community support initiatives to preserve them also in situ/on farm.

Key words*: plant genetic resources, collecting missions, data base, EURISCO*

ENVIRONMENTAL BENEFITS OF BIOFERTILIZERS APPLICATION IN THE AGROECOSYSTEM

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. This paper aims to present the environmental benefits of biofertilizers application in the agroecosystem. Biofertilizers are usually prepared as carrier-based inoculants containing effective microorganisms. Arbuscular mycorrhizal fungi, plant growth-promoting rhizobacteria, and nitrogen-fixing rhizobia are three important groups of biocontrol agents extensively utilized globally. Biofertilizers are a source of nutrition for cultivated crops, as they improve the physical properties of the soil and its structure. The application of biofertilizers improves the absorption of nutrients by plants, stimulates microbiological activity, increases soil humus levels, and improves long-term soil fertility. The application of biofertilizers has an impact on the formation of 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 production. The organic farming system applies biofertilizers authorised by Regulation (EC) No 889/2008, which protect geobionts and insect species that have a biological role in the agroecosystem.

Key words*: agroecosystem, biofertilizers, geobionts, organic farming.*

ALLELOPATHIC EFFECT OF WEED SPECIES ON TOMATO (*SOLANUM LYCOPERSICUM* L.)

Veselka VLAHOVA

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

Corresponding author email: vvlahova179@abv.bg

Abstract

Allelopathy is included in the sight of sustainable agriculture and has been intensively studied in recent years as a phenomenon relevant to plant populations. Weedy plants are part of the biodiversity in agrophytocenosis. The laboratory study aimed to determine the allelopathic relationships between tomato and weed species- Convolvulus arvensis, Cirsium arvense, Portulaca oleracea, Amaranthus retroflexus, Stellaria media etc. The experiment was conducted in 2018-2019 in the laboratory of the Department of Agroecology and Environmental Protection at the Agricultural University - Plovdiv with a test plant - Tomato, variety `Banonia` by the method of Grozdinsky and Rudakov (1976). Seed germination percentage, biometric parameters, and biomass were recorded. The allelopathic activity was estimated using the inhibition rate (IR) parameter according to the formula of Ahn & Chung (2000). Statistical data processing was performed using Microsoft Office Excell- St.Dev. and Duncan`s multiple range test. Based on the results obtained from the interaction between weedy vegetation and the crop - tomato weed control can be effectively implemented.

Key words*: allelopathy, organic farming, tomato, weed species.*

THE INTERACTION BETWEEN NITROGEN SUPPLY AND LIGHT QUALITY ON GROWTH, RESOURCE ALLOCATION AND METABOLIC PROCESSES IN LETTUCE (*LACTUCA SATIVA* L.)

Zheng WANG[1], Ying LIANG[2], Xiao YANG[1], Qichang YANG[1]

[1]Institute of Urban Agriculture, Chinese Academy of Agricultural Sciences, No. 99 Hupan West Road, Chengdu, China
[2]Horticulture Research Institute, Sichuan Academy of Agricultural Sciences, No. 4 Shizishan Road, Chengdu, China

Corresponding author email: yangxiao@caas.cn

Abstract

Light quality and nitrogen alter plant growth, resource allocation and metabolic pathways, but their interaction is poorly understood. In this study, we analyzed the growth and resource allocation and transcriptomes of lettuce in a factorial combining three light regimes (red (R), blue (B) and a 1:1 mixture of red and blue (RB)) and two nitrogen rates. Results showed that red light increased shoot dry weight in relation to both B and RB irrespective of nitrogen supply. Blue light favored root growth under low nitrogen. Allometric analysis showed lower allocation to leaf in response to blue light under low nitrogen, and similar leaf allocation under high nitrogen. A difference of allometric slopes between low nitrogen and high nitrogen in treatments with blue light reflected a strong interaction effect on root-to-shoot biomass allocation. Multifactor analysis of transcriptomes revealed that light qualities and nitrate interactively regulated transcripts for primary and secondary metabolisms via bHLH, GATA and MYB TF families. Our research highlights interactions between nitrogen supply and light quality on dry matter allocation between shoot and root, primary and secondary metabolism in lettuce.

Key words*: Blue light, red light, nitrate deficiency, biomass allocation, nitrogen allocation, anthocyanins, flavonoid, lettuce.*

PLANT FACTORY TECHNOLOGY LIGHTS UP URBAN HORTICULTURE IN THE POST-CORONAVIRUS WORLD

Xiao YANG[1], Li ZHANG[2], Jie PENG[2], Tao HUANG[2], Jiangtao HU[2], Qichang YANG[2], Zheng WANG[2]

[1]Institute of Urban Agriculture, Chinese Academy of Agricultural Sciences (IUA-CAAS), Chengdu, China
[2]National Agricultural Science and Technology Center (NASC) Beijing, China

Corresponding author email: yangxiao@caas.cn

Abstract

The pandemic of novel coronavirus disease 2019 (COVID-19) has highlighted the critical importance of ensuring a consistent supply of horticultural products. Plant factories with artificial light (PFALs) represent rapidly developing and promising horticultural crop cultivation systems that can produce fresh crops in an environmentally-friendly manner. PFALs have been showing great potential to address the most challenging issues in agricultural science and extended fields, such as population growth, water scarcity, loss of arable land, food safety, and supply chain challenges, and thus will undoubtedly play an important role in the agricultural revolution, food security, carbon neutralization, and the future of humankind. In addition, PFALs employ several green and sustainable approaches, thus representing a shift away from horticultural practices based on human intuition and experience towards urban and modern horticulture based on precise data management. Moreover, innovation within PFALs will promote the future integration of the current agricultural field with other rapidly developing techniques (artificial intelligence, advanced materials, synthetic biology) and help achieve the global objectives of sustainable agriculture. Thus, PFALs represent a critical solution for urban horticulture in the post-coronavirus world.

Key words*: artificial light (PFALs), water scarcity, food safety.*

EFFECT OF THE SEAWEED BIOSTIMULANT "KELPAK®" ON THE GROWTH OF CUCUMBER

Milena YORDANOVA, Nikolay FILIPOV

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

Corresponding author email: yordanova_m@yahoo.com

Abstract

Plant biostimulants that have a good effect on the growth and development of plants, especially when they are under the influence of stress factors. The purpose of the experiment was to study the effect of seaweed extract "Kelpak®" on the development of cucumbers, greenhouse production, under different forms of treatment. The experiment was carried out in the unheated glass greenhouse in the Sandanski region - a city in Southwestern Bulgaria with an altitude of 296 m, in 2019, with April planting. Biostimulant Kelpak was applied in two directions: 1) for soaking seeds and roots and 2) treatment during the growing season. 6 variants in four replicates were developed: 1) control nontreated plants – (NT); 2) treated seeds (TS); 3) treated seedling roots (TSR); 4) only vegetation treatment (VT); 5) treated seeds + vegetation treatment (TS+VT); 6) treated seedling roots + vegetation treatment (TSR+VT). Visible differences in plant growth occur after the first vegetation treatment. The variant with only treated seeds (TS) had the highest number of leaves (23rd day after transplanting), the highest number of fruits at the first harvest and the longest stem length.

Key words*: biiostimulant, cucumbers, Kelpak, seaweed, seed treatment.*

FLORICULTURE, ORNAMENTAL PLANTS, DESIGN AND LANDSCAPE ARCHITECTURE

MORPHOLOGICAL AND BIOMETRICAL PROPERTIES OF TEMPERATE ORCHID SEEDS AND THEIR BIOLOGICAL IMPLICATIONS

Nora Eugenia D. G. ANGHELESCU[1], Irina HOLOBIUC[2], Ioana-Cătălina NICOLAE[1], Cosmina Oana VENAT[1], Mihaela I. GEORGESCU[1], Sorina A. PETRA[1], Adrian PETICILĂ[1], Florin TOMA[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Boulevard, District 1, Bucharest, Romania
[2]Institute of Biology Bucharest, Romanian Academy, 296 Splaiul Independenţei, 060031, Bucharest, Romania

Corresponding author email: noradeangelli15@gmail.com

Abstract

This article aims to1 describe the numerical and morphological characteristics of mature seeds belonging to nine genera of temperate orchids. High-resolution images of the seeds' morphological ultrastructure and detailed biometric analyses were obtained by using advanced microscopy methods (SEM - Scanning Electron Microscopy and Stereomicroscopy), for a total of 15 species of spontaneous Romanian orchids. Orchid seeds are distinctive, having unusually small sizes and extremely reduced weights, being described as 'dust-like seeds'. They are extremely light, a feature that enables them to fully cover the areas around the seed parent and disperse further away, colonizing new habitats. Orchid seeds contain a small, globular-ovoid embryo consisting of a few poorly differentiated cells. The centrally placed embryo is devoid of endosperm and cotyledons. The present project aims to take into account the importance of temperate orchid seeds and their biological implications for propagation and proliferation. Additionally, the study thus opens for the first time, a new field of research with important implications for the conservation, protection and rehabilitation of many rare endemic species, all part of the Romanian orchid flora.

Key words*: orchids, seeds, morphology, SEM, microscopy, ecology, conservation, habitats, germination, biology, temperate orchids, orchid seeds.*

THE UNEXPECTED DISCOVERY OF A RARE INTERGENERIC ORCHID HYBRID IN ROMANIA: × *Dactylodenia comigera* (Rchb.) Aver. (Hybrid parental formula: *Dactylorhiza majalis* × *Gymnadenia conopsea*)

Nora Eugenia D. G. ANGHELESCU[1], Lori BALOGH[2], Mihaela BALOGH[2], Nicoleta KIGYOSSY[2], Mihaela I. GEROGESCU[1], Sorina A. PETRA[1], Florin TOMA[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Boulevard, District 1, Bucharest, Romania
[2]Asociatia "Comori de pe Valea Prahovei", Avram Iancu No. 2, Sinaia, Romania

Corresponding author email: noradeangelli15@gmail.com

Abstract

This article presents the first confirmed record of the naturally occurring intergeneric hybrid × Dactylodenia comigera to Romanian orchid flora. This rare hybrid resulted from the cross between orchid species belonging to different genera, Dactylorhiza majalis (genus Dactylorhiza) and Gymnadenia conopsea (genus Gymnadenia). × Dactylodenia comigera was photographed for the first time in May 2020, in Harghita County (Eastern Transylvania). We recorded and compared detailed in vivo morphometric data for 25 phenotypic characters. The hybrid, which arguably represents a single intergeneric pollination event, is phenotypically intermediate between its parental species in most of the characters scored. The flower colour and the mildly spotted leaves are mostly inherited from Dactylorhiza majalis, while the elongated spur comes from Gymnadenia conopsea. The hot climate and humidity of the location also constitute a favourable habitat for a wide variety of insect pollinators. Considering the high density of the sympatric parental species and the significant overlapping in pollinator community, frequent exchange of pollen between the parental species is very likely, resulting in the production of the rare intergeneric orchid hybrid, × Dactylodenia comigera.

Key words*: orchids, hybrid, intergeneric, Romania, pollinators, Dactylorhiza, Gymnadenia, Dactylorhiza majalis, Gymnadenia conopsea, Dactylodenia.*

ANALYSIS OF THE DENDROFLORISTIC COMPOSITION OF URBAN STREET TREE PLANTINGS IN SOFIA

Svetlana ANISIMOVA

University of Forestry, 10 Kliment Okhridsky Blvd, 1797 Sofia, Bulgaria

Corresponding author email: sanisimova@ltu.bg

Abstract

Street landscaping is that part of the urban green infrastructure that is crucial for urban heat island mitigation, climate change adaptation and biodiversity protection. Moreover, it provides city dwellers with various ecosystem services and daily accessible public greenspace.-The aim of this research is to assess the street tree diversity of the city of Sofia. A total of 10,011 street tree specimens were inventoried.-The field studies were conducted from 2021 to 2022, according to the route method. The selection of the sample streets for the survey was made based on the following criteria: street tree plantings covered all street classes of the primary and secondary street network and the variety of possible orientations and street canyon geometries; street tree plantings were located in different administrative territorial units of Sofia Municipality and the survey covered the entire length of the streets. In order to make an approximate assessment of the age of the specimens along the surveyed streets, DBH of each street tree stem was also collected and classified into categories.

The established species composition in the surveyed streets consists of 55 taxa (species and cultivars)

The most commonly used tree species in the new street plantings of the whole city street network was Platanus x *acerifolia (15.09%), while the most prevalent genera was Fraxinus (19.58%). One of the important findings in the analysis of the dendrofloristic composition was the low species diversity at street level. In most of the streets the number of species participating with more than 10% is 2-3. The analysis of the ratio of native to non-native (incl. cultivated varieties) street tree species showed that the non-native species and infraspecific taxa accounted for 57.32% of the total number of specimens*

The results of the study can provide general guidelines for sustainable street plantings planning and design incl. selection of dendrofloristic composition for diverse street tree populations.

Key words: *biodiversity, street trees, landscape design.*

IMPACT OF *PLATANUS* L. SPECIES ON THE POLLEN EMISSIONS AND AIR POLLUTION OF SOFIA

Svetlana ANISIMOVA[1], Elena TSVETKOVA[1], Mariela HRISTOVA-SAVOVA[2]

[1]University of Forestry, 10 K. Ohridsky Blvd., 1797 Sofia, Bulgaria
[2]National Centre of Infectious and Parasitic Diseases, 26 Y. Sakazov Blvd., 1504 Sofia, Bulgaria

Corresponding author emails: sanisimova@ltu.bg, etsvetkova@ltu.bg, eli.savova@abv.bg

Abstract

In the last decades, the presence of Platanus species in the green infrastructure of Sofia has increased. The species are quite tolerant to urban conditions, which makes them preferable for landscaping. Their increased quantity leads to a risk of increased allergenic potential.
The aim of this research was to establish the dynamics of Platanus L. pollen concentrations and to assess their relation to meteorological variables, as well as the impact of plane-tree pollen emissions on the air quality in Sofia.
The analysis of the aeropalynological data on the city of Sofia for the period 2013-2022 found a difference in the length of the flowering period over the 10 years of observation. In general, at the beginning of the studied 10-year period, flowering started in the second half of March, while in 2018 and from 2020 to 2022, it began from the first half of April. The shortest flowering period was in 2015, in contrast to the longest durations in the following two years (2016 and 2017). In 2016 and 2017, the flowering continued in June and the beginning of July. In 2013, 2014 and 2019 the peak was similarly in the second half of April when temperatures rose and the pollen season was extended /to about 75 days/.
The results of the study showed that the meteorological factors which directly affect the concentrations of airborne pollen were wind speed, relative humidity, atmospheric pressure and solar radiation.
For the time being, the amount of Platanus pollen in Sofia is relatively low. However, in recent years there has been an upward trend. That growth trend is expected to continue due to the degree of maturity of Platanus specimens. The presence of that species as a dominant element in the urban green infrastructure of Sofia should be reconsidered, not only to improve air quality, but also to enhance urban biodiversity, its resilience and ecosystem services. The obtained correlations between seasonal pollen levels and some PM_{10} also highlight the possible contribution of Platanus pollen to air quality deterioration in Sofia.

Key words: *Platanus, allergenic pollen, meteorological variables, PM_{10}.*

IMPACT OF PERENNIAL FLOWER PLANTS USED IN LANDSCAPES IN BUCHAREST

Simona BĂLAN-IONESCU (POPESCU), Florin TOMA

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

Corresponding author email: simona.doctorat@gmail.com

Abstract

Urban landscaping such as green squares, flowerbeds and green pills are the most common, most numerous and most exposed to traffic. Cities in the European community and major cities worldwide are increasingly using perennial flowering plants in urban landscaping and investing in research into the adaptability of these types of plants to harsh urban conditions. Bucharest is only at the beginning of introducing perennial flowering plants in the design of these types of green spaces, as there are no studies on species that are resistant to the level of pollution and environmental conditions of this city. This paper discusses the impact of perennial flowering plants in urban landscaping in Bucharest, in heavily trafficked road and pedestrian areas, presenting both the problems encountered and the good things about the landscaping choices made by the municipality. At the same time, the paper aims to demonstrate the need for the involvement of the municipality and the specialist community in carrying out comprehensive studies on the resilience of perennial flowering plants in the current urban space of Bucharest, as on their use.

Key words*: Bucharest, perennial flower plants, urban green spaces, urban landscape.*

LANDSCAPING IN THE CITY OF BUCHAREST WITH FLOWERING PLANTS IN THE CONTEXT OF POLITICAL INFLUENCES AND LOCAL LEGISLATIVE REGULATIONS

Simona BĂLAN-IONESCU (POPESCU), Florin TOMA

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

Corresponding author email: simona.doctorat@gmail.com

Abstract

Urban landscaping is important for any city in the world, including Romania`s capital, Bucharest. In the context of Romania`s entry into the European Union, national legislation has been adopted to protect the environment and green spaces within urban areas. At the same time, for the municipality of Bucharest, specific local regulations have also been adopted for the protection/landscaping of the city`s green spaces, including and directly targeting the use of flowering plants in landscaping. This paper presents both the context and the influence of political power and legislative hibernation in the municipality`s landscaping decisions. At the same time, it highlights the importance of adopting clear and strong legislation that can genuinely protect green spaces and, by extension, the flowering plants used in landscaping, and the mandatory introduction of the requirement that landscaping be carried out only by specialists in horticulture and landscape architecture.

Key words*: Bucharest, perennial flower plants, urban green spaces, urban landscape.*

ASPECTS REGARDING THE ORNAMENTAL VALUE OF SOME TEAHIBRIDA AND FLORIBUNDA ROSE VARIETIES FROM "TUDOR NECULAI" NURSERY COLLECTION - IAŞI COUNTY

Roberto BERNARDIS

University of Life Sciences "Ion Ionescu de la Brad" of Iaşi,
3 Mihail Sadoveanu Alley, Iaşi, 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 paper presents aspects regarding the ornamental value of some Teahibrida and Floribunda rose varieties, from "Tudor Neculai" nursery collection, cultivated in Iasi region conditions. The observations regarded six rose varieties, three from Teahibrida class: 'Burgund', 'Crimson Glory' and 'Grand Prix'; and three from Floribunda class: 'Betty Prior', 'Foc de Tabără' and 'Rumba'. 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 odour.

Key words*: roses, stems, buds, flower.*

STUDY REGARDING THE LANDSCAPE REVITALIZATION OF THE *TENARIS-SILCOTUB* STEEL MILL IN CĂLĂRAȘI

Vladimir Ionuț BOC, Ana VIȚA, Claudia FABIAN, Cristina MÃNESCU

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

Corresponding author email: vladimirboc@gmail.com

Abstract

Industrial areas face a deficit of green spaces and a low share of dendrological vegetation. Thus, the study seeks to identify sustainable solutions for increasing vegetation cover and developing shelterbelts to reduce noise and to improve the visual impact. The proportion of dendrological vegetation at the Tenaris-Silcotub steel mill, located in the city of Călăraşi, was very low. In order to determine the optimal greening solutions, soil samples were taken, the existing vegetation was analyzed, and subsequently a selection of species and cultivars compatible with the local pedoclimatic conditions was made. Considering international standards for landscape design of the areas transited by the underground and above-ground utility networks, a planting design concept was created aiming to minimize the effects of the industrial activity. Also, a series of similar landscape interventions from Europe and the world in industrial and post-industrial areas were analyzed, compared and integrated into the design scenarios. The conclusions reveal the importance of local conditions assessment, vegetation selection and the adaptation of the planting design approach to the restrictions imposed by the land.

Key words*: industrial landscape, sustainable planting design, shelterbelts, steel mill.*

INTRODUCING ARCHITECTURAL-LANDSCAPE ELEMENTS IN URBAN SQUARES FOR HIGHER QUALITY OF LIFE

Mirela COJOCARIU, Ana BOGRUG, Doina Mira DASCĂLU, Ana-Maria-Roxana ISTRATE, Codrina GRECU

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

Corresponding author email: codrina_grecu@uaiasi.ro

Abstract

The value and attractiveness of landscaped green spaces stem from their ability to satisfy the general need for urban comfort and quality of life. This study suggests a redevelopment of Independence square by introducing architectural and landscape elements ensuring a higher degree of attractiveness. The square is located in the center of Iasi between Independence Boulevard and Vasile Conta Street, creating a large urban triangle with Union and Mihai Eminescu Squares. The redevelopment solution was created and presented in detail considering site features, using practical functional and urban composition research. The aim of this proposal was to meet such current goals as creating a comfortable urban environment for relaxation, socialization, and contemplation but also raising the quality of daily life and free-time spending in a pollution-free environment. The suggested concept tried to create a unitary and multifunctional space covered by a set of landscaping effects that harmoniously integrate the area into the urban tissue of Iasi.

Key words*: landscaped green areas, redevelopment solution, urban environment, urban tissue.*

STUDY REGARDING THE IDENTIFICATION OF THE FUNGUS *PESTALOTIOPSIS FUNEREA* (DESM.) STEYAERT ON THUJA FROM TIMIȘ AREA, ROMANIA - CASE STUDY

Otilia COTUNA[1], Mirela PARASCHIVU[2], Veronica SĂRĂȚEANU[1], Elena PARTAL[3], Alin CĂRĂBEȚ[1]

[1]University of Life Sciences "King Mihai I" from Timisoara, Romania, 119 Calea Aradului Street, Timișoara, Romania
[2]University of Craiova, Faculty of Agronomy, 19 Libertății Street, Craiova, Romania
[3]National Agricultural Research and Development Institute Fundulea, 1 Nicolae Titulescu Street, Fundulea, Romania

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

Abstract

Pestalotiopsis funerea is one of the most frequently reported fungus on thuja plants from nurseries, landscape arrangements and gardens. The species of Pestalotiopsis are considered in general as opportunistic pathogens. With all of these, in favourable conditions it produces severe damages to the attacked plants. The purpose of the research was to identify the pathogen that has produced burning like symptoms on the leaves of thuja plants from a landscape arrangement from Timisoara. In the first stage was performed the identification by the visual analysis of the plants. For the analysis at the binocular magnifier and microscope were prepared samples from 10 thuja plants that were transported at the laboratory. After the visual and microscopic analyses it was identified the fungus Pestalotiopsis funerea. The external symptoms observed on thuja plants were: chlorosis and yellowing of the foliage, whitish-grey foliage agglomerations, browned sprigs, burns of the sprigs starting from the top and continuing to the base. Thuja plants from the ornamental spaces from Timișoara started to dry due to this pathogen, their aesthetic value and vigour being very dramatic affected.

Key words*: Pestalotiopsis funerea, Pestalotiopsis blight, thuja, conidia, pycnidia.*

CARULASPIS JUNIPERI (BOUCHÉ) (DIASPIDIDAE: CARULASPIS), PEST OF *THUJA* FROM TIMIȘ COUNTY - CASE STUDY

Otilia COTUNA[1], Mirela PARASCHIVU[2], Veronica SĂRĂȚEANU[1], Ramona ȘTEF[1], Klaudia KINCEL[3]

[1]University of Life Sciences
"King Mihai I" from Timisoara, Romania,
119 Calea Aradului Street, Timișoara, Romania
[2]University of Craiova, Faculty of Agronomy, 19 Libertății Street
Craiova, Romania
[3]Station of Agricultural Research and Development Lovrin, 200 Principală Street, Lovrin, Romania

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

Abstract

Carulaspis juniperi (Bouché) (juniper scale) is known in general as pest of the coniferous, and especially of the juniper (Juniperus spp.). It belongs to Diaspididae family, genus Carulaspis. In Romania, the literature is poor regarding the information available about this pest that during the last year produces damages to conifers in parks and gardens. In the present research we are reporting the presence of this pest on thuja from Timiș area (western Romania, where the damages are obvious, the plants losing their aesthetic value. Identification of the pest was performed with classic methods (visual analyses of plants and at stereomicroscope in laboratory). There were collected samples from 15 thuja plants from Timișoara and Calacea area (Timiș County). On the plants were observed juniper scales located individually or in colonies on leaves, young stems and branches. The analysed plants presented obvious damage produced by this pest, respectively chlorotic or browned leaves, dry sprigs, dry branches and even dead plants. The attack intensity was comprised between 1 and 4 (marks according with Borhsenius scale). The frequency of the attacked plants was 100%.

Key words*: Carulaspis juniperi, thuja, juniper scale, pest, sexual dimorphism.*

GAS EXCHANGE AND LEAF CHLOROPHYLL ESTIMATES OF SOME DECIDUOUS TREE SPECIES DURING AUTUMN SENESCENCE

Elena DELIAN[1], Elena SĂVULESCU[2]

[1]Bioengineering of Horticultural and Viticultural Systems Department, Faculty of Horticulture, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]Biodiversity, Landscape and Ornamental Horticulture Department, Faculty of Horticulture, USAMV Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: elena_savulescu@yahoo.com

Abstract

The ontogenetic cycle of the plant involves going through the phases of seeds, seedlings, juvenile, maturity, and senescence. Leaves senescence of woody plants represents a physiological phase of transition from the nutrient's assimilation to their remobilization to different plant' organs, to ensure the survival of the species and its growth in the following year. The purpose of the present study was to quantify the leaves gas exchanges (photosynthesis rate, transpiration rate, stomatal conductance, and intercellular carbon dioxide content) and to estimate their chlorophyll content, during the autumn senescence, in some deciduous tree species (belonging to 16 different families), grown in the Botanical Garden of the University of Agronomical Sciences and Veterinary Medicine from Bucharest. The obtained data can be added to those already existing, to better understand the plants behaviour during leaves senescence.

Key words*: botanical garden, physiology, deciduous trees, leaf senescence*.

THE POLLEN MORPHOLOGY OF DIFFERENT *IRIS* L. SPECIES FROM ROMANIA

Mihaela Ioana GEORGESCU[1, 2], Aurora DOBRIN[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: aurora.dobrin@qlab.usamv.ro

Abstract

In order to have proper identification of Iris species, many scientific works are referring to the morphological features of pollen grains as adequate sources of information about the origin and variability concerning the different populations of Iris. According to several taxonomic works, in Romania are 17 (18) species of Iris. There is a lack of information about the morphology of pollen in Iris species from our country. SEM analyses of pollen from five populations of Iris species from the Botanical Garden of the University of Agronomic Science and Veterinary Medicine of Bucharest revealed that four of them had reticulated exine, respectively Iris germanica, I. pseudacorus, I. variegate, and I. suaveolens and one had gemmated exine - Iris pumila. The pollen morphological description presented in this study may be of systematic significance to Iris species, enabling species distinction.

Key words*: exine; morphology, pollen, Roumanian Iris species, scanning microscopy.*

INVASIVE ALIEN PLANTS IN GRASSLANDS FROM THE LAND OF FĂGĂRAȘ

Mihaela Ioana GEORGESCU, Vasilica LUCHIAN

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

Corresponding author email: vasilica.luchian@horticultura-bucuresti.ro

Abstract

Using flowing water as a transportation medium for seeds and fruit, invasive plant species can spread rapidly, making river banks an environment where they can grow prosperous populations. In the plain of The Land of Fagaras, on the fringe of water courses, are many meadows with rich plant diversity. During field research conducted in 2021 and 2022, data from grasslands near twelve towns were collected to observe the presence of invasive plant species in this area. Sixteen species from the List of invasive and potentially invasive alien plants in Romania were identified in or close to analyzed grasslands. One of them, Impatiens glandulifera Royle, is on the List of invasive alien plants of concern for the EU. In the river banks, small or extended populations are formed, and only a few of these invasive species are installed in the grassland, except for Erigeron annuus.

Key words*: grassland, invasive alien plant species, the land of Fagaras.*

USING THE PRINCIPLES OF THERAPEUTIC GARDENS IN THE PROPOSED REDEVELOPMENT OF THE GREEN SPACE OF THE "PROF. DR. NICOLAE OBLU" HOSPITAL IN IASI

Codrina GRECU, Mirela COJOCARIU, Clara-Teodora BĂLAN, Doina-Mira DASCĂLU

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

Corresponding author email: mirela_c@uaiasi.ro

Abstract

The paper presents a study on therapeutic gardens with an example of applying their composition rules within a landscaping project proposal for the green space of the hospital "Prof. Dr. Nicolae Oblu" in Iasi. These therapeutic gardens have been used over the years as specially landscaped outdoor spaces near hospitals or in the inner courtyards of various rehabilitation or treatment centers. These gardens' design and construction principles help improve and heal patients' ailments more quickly and contribute to the well-being of all institution staff and visitors. The same rules and principles underlie the garden design concept of the Iasi Clinical Neurological Hospital, which, through this redesign proposal, has been given the possible status of a public garden with a warm and welcoming atmosphere, which also meets the criteria specific to therapeutic gardens.

Key words*: therapeutic gardens, hospitals green areas landscaping, landscape design principles.*

FRUCTAN CONTENT AND SOLUBLE SUGARS IN SOME ORNAMENTAL PLANTS

Ivanka HAMBARLYISKA[1*], Patricia GEORGIEVA[1], Radka VRANCHEVA[2], Jorge Juan-VICEDO[3], Nadezhda PETKOVA[1]

[1]Department of Organic Chemistry and Inorganic Chemistry, University of Food Technologies, 26 Maritza Blvd., 4002, Plovdiv, Bulgaria
[2]Department of Analytic and Physicochemistry, University of Food Technologies, 26 Maritza Blvd., 4002, Plovdiv, Bulgaria
[3]Universidad Católica de Valencia San Vicente Mártir. Instituto de Investigación en Medio Ambiente y Ciencia Marina (IMEDMAR), Calle Guillem de Castro, 94. 46001, Valencia, Spain

Corresponding author emails: vanya.hambarliyska@gmail.com, petkovanadejda@abv.bg

Abstract

The aim of the current study was to evaluate the content of total fructans, as well as the individual sugars in the different vegetal parts of 13 ornamental plants. Six Allium representatives (Allium sphaerocephalon, Allium aflatunence, Allium 'Gladiator', Allium 'Globus', Allium large-flowered mixed and Nectaroscordum siculum Lindl.), two tulip cultivars, two hyacinth cultivars, Lapiedra martinezii Lag., Tanacetum balsamita and Calendula officinalis were used for the analysis. Ultrasound-assisted water extraction was performed to extract fructans and sugars. Thin layer chromatography and high performance liquid chromatography coupled with refractive index detector (HPLC-RID) method were used for analysis of fructans and sugars analysis. Allium representatives showed the highest content of inulin in their bulb. N. siculum bulb showed the highest fructans and inulin content - 24 g/100 g DW and 17 g/100 g DW, respectively. Fructans in tulip cultivars were in the low values - 3.3-3.8 g/100 g DW. Inulin content in L. martinezii bulbs reached 6 g/100 g DW, while in the roots of C. officinalis - 3.5 g/100 g DW. In the leaves of T. balsamita and L. martinezii only glucose, fructose and sucrose were detected.

***Key words**: Allium, fructans, inulin, Lapiedra martinezii, tulip.*

LANDSCAPE DESIGN PROCESS OF A PRIVATE EVENTS VENUE GARDEN IN IASI COUNTY, ROMANIA

Ana-Maria-Roxana HANGAN, Mirela COJOCARIU, Codrina GRECU, Vasile STOLERU

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

Corresponding author email: roxanah@uaiasi.ro

Abstract

Due to urban acceleration and current social and economic development, gardens have begun to receive increased attention from society. Just as therapeutic gardens can be designed for hospitals or green relaxation spaces for employees, gardens can also be designed for event locations. Private event venues have begun to pay more attention to green space around buildings to provide attendees with green areas to relax and socialize. More and more event locations are located on the city's outskirts, thus offering the opportunity to create perspectives with natural views. In the present work, it was desired to design a private garden for events with multiple purposes (civil weddings, christening parties, marriage parties, corporate parties, etc.), in the Iasi city, Romania, on the shores of Lake Ciric II. The design style adopted had sinuous forms and minimal intervention on the existing tree vegetation. The proposed vegetation was represented by deciduous trees that will provide decoration through shape and color and by shrubs grouped in compositions that will provide decoration in all seasons.

Key words*: landscape design, private garden, multifunctional garden, design process, events venue.*

THE GROWTH DYNAMICS OF PAULOWNIA TREES CULTIVATED AS ENERGY PLANTATIONS IN THE FOREST-STEPPE ZONE OF UKRAINE

Mykhailo HUMENTYK [1], Mykola KHARYTONOV [2], Antin SHUVAR[3], Halyna PYRIH[3], Volodymyr HUMENTYK[1]

[1]Institute of Energy Crops and Sugar Beet, 25 Klinichna Str., 03110, Kyiv, Ukraine
[2]Dnipro State Agrarian and Economic University, 25 Serhii Yefremova Str., 49005, Dnipro, Ukraine
[3]Western Ukrainian National University, 1 Lvivska Str., 46009, Ternopil, Ukraine

Corresponding author email: kharytonov.m.m@dsau.dp.ua

Abstract

The main objective of this study was to establish the impact of varietal characteristics of Paulownia trees on growth and productivity depending on the density of planting in the forest-steppe zone of Ukraine. The greatest increasing of Paulownia "Clone 112" trees height - 425 cm was fixed in the first year of vegetation at a density of 625 plants/ha. The same tendency observed in the fourth year. The highest height of Paulownia Clone 112 during the vegetation season was observed in June (170 cm), Paulownia Tomentosa - 140 cm. The smallest increase in height was achieved in October, 40 cm and 35 cm, and in April, 15 cm and 10 cm, respectively. A first year trunk of a Paulownia tree reaches a diameter of 4-6 cm, a second year trunk - 7-10 cm, a three-year trunk - 11-16 cm, a four-year trunk - 15-23 cm. A linear relationship between the height and diameter of Paulownia trees was established. It is enough to measure one leaf dimension (length or width) to determine the area of the leaf surface.

Key words*: paulownia, variety, clone, growth parameters, density of plantations*.

INFLUENCE OF ROOTING MEDIA AND HORMONES ON MANDEVILLA VEGETATIVE PROPAGATION

Endre KENTELKY[1], Erzsébet DOMOKOS[1], Zsolt SZEKELY-VARGA[1], Monica BOȘCAIU[2]

[1]Sapientia Hungarian University of Transylvania,
Faculty of Technical and Human Sciences, Department of Horticulture,
Calea Sighișoarei 2, 540485 Târgu Mureș, Romania
[2]Universitat Politècnica de València, Mediterranean Agroforestry Institute (IAM), Camino de Vera s/n, 46022 Valencia, Spain

Corresponding author emails: domokos.erzsebet@ms.sapientia.ro, zsolt.szekely-varga@ms.sapientia.ro

Abstract

Ornamental flowering plants are used worldwide for landscape design and as cut flowers. Most are imported from abroad and climatic conditions are different in their countries of origin. Although they produce seeds, these are often sterile and cannot germinate. Therefore, such species are multiplied vegetatively. In the present study it was investigated the propagation of two varieties of Mandevilla sanderi under the effect of three different rooting hormones (Incit 8, Radi-Stim® nr.1, Radi-Stim® nr.2), and two different rooting media (peat-perlite and peat). Untreated cuttings were considered as control. The results indicate that significant changes were obtained under the effect of the selected rooting stimulants, and that the rooting media did not influence the root initiation of the cuttings. Furthermore, no significant changes were observed on cuttings growth after transplantation. In conclusion, the current research shows that I8 and R2 increase the rooting of Mandevilla cuttings, and that the rooting media have no effect on the plants.

Key words*: climbing plant, cuttings, Mandevilla, stimulants, propagation.*

GREEN REHABILITATION CONCEPT FOR A POST SOCIALIS MARKETPLACE (PROMOTING THE LOCAL FARMERS AND SUPPORTING THE GREEN INFRASTRUCTURE OF THE CITY OF TÂRGU MUREȘ)

Endre KENTELKY, Gabriella KISS, Ildikó LIHĂT, Róbert Marius TĂSLĂVAN, Martin JAKAB, Zsolt SZEKELY-VARGA

Sapientia Hungarian University of Transylvania,
Faculty of Technical and Human Sciences, Department of Horticulture,
Calea Sighișoarei 2, 540485 Târgu Mureș, Romania

Corresponding authors emails: ildiko.lihat@gmail.com,
zsolt.szekely-varga@ms.sapientia.ro

Abstract

Marketplaces, are integral parts of cities all over the world. In the last decades the rapid urbanization is putting pressure on the cities, this creates numerous problems for locals. Besides over-urbanization syndrome, Târgu Mureș is still struggling with the influence of the post-socialist era, the nature of the communist vision can still be noticed. The present paper tackles the importance of marketplaces from two points of view: the sociological point of view, why it is important for locals and society; and from the point of view of ecology. The rehabilitation and re-naturalization of the marketplaces creates a pleasant meeting point for locals, helps boosting the sale of local products, strengthens the economy and supports the sustainable character of the settlement. The proposed plan can serve as a model for the renovation and development of marketplaces in dense urban areas. The researched marketplace is located close to the city center, to its historical places, and could become a good green space not only for the acquisition of goods, but for recreation space as well.

Key words*: buy local, green infrastructure*, *marketplace rehabilitation, sustainable city.*

ECOLOGICAL EDUCATIONAL TRAIL, AS LINKAGE BETWEEN NATURAL AREAS AND HISTORICAL HERITAGE, PRESENTED BY THE CASE STUDY OF PĂNET VILLAGE

Endre KENTELKY, Gergely Loránd SZABÓ, Ildikó LIHĂT, Noémi HEGEDŰS, Anna Imola HENNING, Endre VÁNYOLÓS, Zsolt SZEKELY-VARGA

Sapientia Hungarian University of Transylvania,
Faculty of Technical and Human Sciences, Department of Horticulture,
Calea Sighișoarei 2, 540485 Târgu Mureș, Romania

Corresponding authors emails: ildiko.lihat@gmail.com,
zsolt.szekely-varga@ms.sapientia.ro

Abstract

With the expansion and overcrowding of cities, there is an ever-increasing demand and need for "close to nature" areas, which provide recreation and relaxation. The aim of the study is to present a method for the creation of an ecological educational trail, which can link the natural places with the local historical heritage of settlements in Transylvania. Educational paths highlight the values of the past and transfer it in such an actuality and modern way that can be approached from several sides. This symbolic linkage created by the educational trail is between the present represented by the natural areas, and the church and the central areas next to it representing the historical heritage, as the past. The planned educational trail is located in the Pănet settlement, in the Transylvanian plain, 11 km from Târgu Mureș. The goal is to re-think and recall the very close connection between humans and nature, as in the old days. For this purpose, the educational trail proves to be a promising solution given this rich vegetation and natural features in the area.

Key words*: ecological educational trails, livable places, sustainable city.*

GROWTH AND FLOWERING PERFORMANCE EVALUATION OF TEN POTTED CHRYSANTHEMUM CULTIVARS

Manuela MANDA, Carmen NICU

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

Corresponding author email: alexa25nicu@yahoo.com

Abstract

Chrysanthemum is one the most important flower crops commercially grown for cut flower, loose flowers, bedding and pot plants. Along with ensuring optimal culture conditions, an appropriate nutrition regime and the application of appropriate management, the most important factors on which the success of a chrysanthemum containerized culture depends are: the choice of suitable varieties for containerized culture, high-quality planting material. In order to diversify the current Chrysanthemum assortment and to promote of the most valuable cultivars for containerized culture, an experiment was conducted to evaluate the growth and flowering performance of ten Chrysanthemum cultivars, in greenhouse conditions. From the data presented, taking into account both flowering phenology and morphological characters, decorative features, the best varieties within the studied Chrysanthemum assortment were Meridian White and Sumbeam Pink Bicolor.

Key words*: Chrysanthemum, cultivars, flowering, growth, potted plants.*

BIRCH SAP HARVESTING IN CHANGING SPRING CONDITIONS AND ITS IMPACT ON TREES GROWTH

Cristina MĂNESCU[1], Miruna TUDORACHE[1], Gabriel DĂNILĂ[2], Paul ILIESCU[2], Valerian SIMIONIUC[2], Elisabeta DOBRESCU[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania
[2]Ştefan cel Mare University of Suceava, 13 Universităţii Street, 720229, 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 North-East of Romania was between 25th of March - 5th of April, when the air temperatures did not exceed 15^{o}C. Trees higher than 20 m were most productive. At the end of the growing season, tapped trees were smaller than those untapped. These results suggest that in time, the tapped trees are less productive due to loss of vigour rather than spring weather conditions.

Key words*: Betula pendula, climatic changes, sap production, trees height.*

EFFECT OF PLANTING DATE ON ANEMONE PLANTS, GROWN IN A SUSTAINABLE GARDEN IN BUCHAREST, ROMANIA

Cristina MĂNESCU, Florin TOMA, Aurelia PETRA, Ionela ILIESCU

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

Corresponding author email: cristina.manescu@horticultura-bucuresti.ro

Abstract

Corms of a mixed cultivars of Anemone coronaria ('Mr. Fokker', 'Sylphide', 'Hollandia', 'The Bride', 'Harmony White') were planted in raised beds during the fall, winter and spring. Without applying any maintenance except weed control, plants from the corms planted in November had the most flowers and managed to survive best during the two years of observations. Anemones planted in February and March were able to flower in June and July, when the air temperature was over 30°C. In conclusion, Anemone coronaria proved to be an excellent species for spring conditions in Bucharest, with an extended flowering period, much more than other species such as tulips, daffodils or hyacinths. Moreover, regardless of the planting date, anemone plants are suitable for sustainable flower plantations.

Key words*: Anemone coronaria; climate changes; flowerbeds; phenology events.*

SUSTAINABLE CITIES IN 21TH CENTURY - A REVIEW OF THE IMPLICATIONS OF EDIBLE LANDSCAPES

Andreea MELINESCU[1], Sina COSMULESCU[2]

[1]University of Craiova, Faculty of Horticulture, Doctoral School of Plant and Animal Resources Engineering, A.I. Cuza Street, no. 13, Craiova
[2]University of Craiova, Faculty of Horticulture, Department of Horticulture and Floriculture, A.I. Cuza Street, no. 13, Craiova, Romania

Corresponding author email: melinescu93@gmail.com

Abstract

The fast forward process of urbanization, the technology and population rise in cities leads to finding improved ways of creating an ecological system that benefits both the humans and the urban environment. Concepts such as edible landscape need to be put in practice in order to maintain a correct relationship between biodiversity and human intervention on nature. This paper is a systematic review of edible landscape concept implications on the quality of human life and biodiversity system. The goal of this review is to provide an visione and an understanding of edible landscape, in order to design efficacious green spaces that combine the utilitarian function, the aesthetic function and the environment function, a trio that is vital for the 21th century, in order to develop sustainable cities.

Key words*: edible landscape, landscape, sustainable cities, green spaces.*

INDIGENOUS AND EXOTIC PLANTS IN EARLY MODERN ROMANIAN PUBLIC PARKS. ORNAMENTAL VERSUS UTILITARIAN

Alexandru MEXI

`Vasile Goldiș` Western University of Arad, 94 Revolutiei Blvd, Arad, Romania
University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: alx.mexi@gmail.com

Abstract

By the mid and late 19th century, Romanian municipalities from south and east of the Carpathians began to modernize and beautify the cities according to Western models; particularly, by creating public parks similar to the ones designed in European capital cities such as: Paris, Vienna, London, Berlin, Budapest or Rome. Today, many aspects still remain unclear concerning the planting schemes and the plants used to decorate these early modern green public (as well as private) spaces in Romania, and one such aspect refers to the use of indigenous versus exotic plants, as well as ornamental species versus utilitarian ones. To this end, the following paper will look into Romanian public park history in order to illustrate how planting schemes and compositions were designed and indigenous/exotic and/or ornamental/utilitarian species were used in these new and modern public spaces. The research is based on archival documentation, bibliographical, and in situ research and highlights historic (19th and early 20th century) planting schemes, models for the planting of public spaces, species used and reasons for using them.

Key words*: garden history, public parks, indigenous, exotic varieties, plant collections.*

INNOVATIVE RESEARCH ON THE PRODUCTION OF TUBEROSE BULBILS FOLLOWING ARTIFICIAL LED LIGHTING

Emilian MIREA[1], Burnichi FLOAREA[1], Toma MITEL[1], Toma FLORIN[2]

[1]Vegetable Research Development Station Buzau,
23 Mesteacanului Street, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest,
59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: mirea_emilian_11@yahoo.com

Abstract

Flowers have always been part of human life, being used for various purposes. One of the most popular and beloved flowers in Romania is the tuberose, known for its ornamental value and use in the cosmetic and medical industries. To carry out the experiment, a study lot with the `Avatea` variety was established, located in the vertical greenhouse of the Vegetable Research and Development Station Buzau, Romania. The study presents the results of the experiment that considered the production of tuberose bulbils after additional LED lighting of the bulbs, before planting. For additional lighting, high power LED panels were used, with monochromatic blue, red and white light. The effect of additional lighting of the bulbs before planting was monitored, biometric determinations were performed on the experimental variants, during the vegetation period, and bulbils production was determined, per variants. The highest bulbil production was obtained in the V2 variant, compared to V1 witness.

Key words*: LED, tuberose, vertical greenhouse, production of bulbils.*

IDENTIFICATION OF MAIN PHENOTYPIC TRAITS OF *DIANTHUS* SPP. CORE-COLLECTION VARIETIES OF PGRB BUZAU BASED ON FLOWER DESCRIPTORS

Bianca MUŞAT (ZAMFIR), Costel VÎNĂTORU, Camelia BRATU, Geanina NEGOŞANU, Matilda POPESCU, Florin BURLAN

Plant Genetic Resources Bank - for Vegetables, Floricultural, Aromatic and Medicinal Plants Buzău, 56 Nicolae Bălcescu Bldv, Buzău, Romania

Corresponding author email: zamfir_b@yahoo.com

Abstract

Carnation (Dianthus caryophyllus L.) is one of the world's main floricultural crops along with chrysanthemum and rose. Over time, the aim of Dianthus breeding has been to select or hybridize for totally white or double flowers. BRGV Buzau core collection contains more than 52 varieties of this species, organised in 5 groups according to the type of flower and the direction of use: C group (cut flowers), Gs group (garden type, single flower), Gd group (garden type- double flower), Pd group (pot type-double flower), Ps (pot type-single flower). From the 5 groups, 26 varieties belonging to the following species have been selected for the present work Dianthus caryophyllus si Dianthus chinensis with distinct phenotypic expression. The breeding methods used were clonal selection and repeated individual selection. From selected morphotypes, G I.3., G II.7, G III.6, G IV.3, G V.4 were completely different. The aims of breeding these varieties were the specific clove fragrance, the immaculate white colour, the presence of double flowers, the long vase life and the pleasant commercial and ornamental appearance.

Key words*: morphotype, fragrance, vase life, double flower, carnation.*

RESPONSE OF ZINNIA PLANTS TO FOLIAR APPLICATION OF SALICYLIC ACID

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

*Zinnia elegans Jacq. is one of the most popular annual flowering plants, highly appreciated due to the great diversity of flower sizes, shapes and colours, as well as abundant blooming throughout the summer. It is widely used in gardens, and as a cut flower in bouquets and floral arrangements, but can also be grown in containers and pots, for patios and balconies decoration. This study was conducted to evaluate the effect of exogenous salicylic acid (SA) applied in different concentrations (0, 75, 100 and 200 ppm), on the vegetative growth and flowering of this plant. The results showed that foliar application of salicylic acid had a positive effect on the main analysed morphological characteristics. The maximum values of plant height***,*** number *of branches* per plant, *leaf length and width,* number *of flowers* and *flower diameter were obtained in plants sprayed with 200 ppm SA, compared to control plants. The salicylic acid induced early flowering, the lowest number of days required to opening of the first flower was recorded at 100 ppm concentration.*

Key words*: Zinnia, salicylic acid, foliar application.*

PRELIMINARY RESULTS REGARDING THE BEHAVIOR OF SOME CAMASSIA SPECIES IN IAŞI ECOLOGICAL CONDITIONS (NORTHEASTERN ROMANIA)

Alina-Ștefana OZARCHEVICI, Maria APOSTOL, Lucia DRAGHIA

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

Corresponding author email: lucia@uaiasi.ro

Abstract

Camassia (family Asparagaceae) includes bulbous herbaceous plants native to North America and cultivated for over 7000 years for ornamental and food purposes. Ancient legends and frequent use in traditional celebrations in some areas of North America emphasize the value of camas plants In this paper, the behavior of two species of Camassia, respectively C. quamash and C. leichtlinii, cultivated in the experimental flower field of University of Life Sciences of Iasi, Romania, was evaluated. Within each species, two experimental variants were made, depending on the size of the bulbs used to establish the crops. Observations made during 2021-2022 revealed differences determined by both the species and the size of the bulbs. C. leichtlinii stood out by larger bulbs and taller flower stems, with longer inflorescences, larger and numerous flowers. The size of the bulbs had a greater influence on the number of flowers and leaves. From the phenological point of view, the initiation of vegetation and the appearance of flower stalks took place approximately simultaneously in all variants, instead, flowering was about 14 days earlier in C. quamash.

Key words*: bulb size, camas, ornamental characters.*

EFFECT OF ULTRASOND TREATMENT ON THE SEEDS OF DIFFERENT GLADIOLUS (*GLADIOLUS HYBRIDUS* L.) VARIETIES ON THE SOWING QUALITY

Valantin PANCHEV

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

Corresponding author email: valeintin_panchev@abv.bg

Abstract

The main aim of the present study was to investigate the possibility of stimulating of the viability behaviors of gladiolus seeds. The studies were carried out with seeds of three varieties of gladiolus. Seeds were treatment with ultrasound for 2, 4, 6, and 8 min. Germination energy, germination, main germination time, uniformity of germination, germination index, time of 50% germinated seeds, seedling morphology and vigor were reported. The correlation dependences on the seedlings weight with length of the embryo root and hypocoityl, as well as a linear regression between the treatment period and germination, characterized with high determination coefficients were established. The highest viability was reported in application of 6 minutes ultrasound, approximately 18% above the control. These results can be used in propagation of cormels as well as hybrid selection.

Key words*: germination, gladiolus, stimulation, seedling morphology, viability.*

LEAD AND ITS IMPACT ON SOIL FERTILITY DEGRADATION AND CROP PLANTS

Nicoleta Luminiţa PARASCHIV, Mariana VOLF, Elena-Liliana CHELARIU, Elena Diana BOLOHAN

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

Corresponding author emails: marianavolf@gmail.com, julia@uaiasi.ro

Abstract

Currently, only one third of the lead spread in the environment is recycled, the rest contributing to the contamination of the environment. Among the sources of environmental contamination with this heavy metal, we mention: mining operations, plants that process lead ore or those that manufacture batteries, which limit well-circumscribed territories, dependent on the direction of dominant winds and main water flows; exhaust gases from internal combustion engines (gasoline contains a series of lead compounds that raise its concentration to around 400 ppm Pb); use of Pb-containing products such as lead-based paints, lead-containing containers, lead pipes, lead-containing insecticides, discarded waste batteries. The paper presents the concentrations of lead in some urban locations and adjacent to the city of Iasi, probable causes of its accumulation in the surface starts of the soils and its translocation in plants, with repercussions in the case of accumulations beyond the allowed limits, on the crops. The values determined in the soil oscillate between 30.90 and 37.91 Pb µg / g

Key words*: heavy metal, soil pollution, urban location.*

MORPHOMETRIC ANALYSIS AND ASSESSMENT OF GENETIC DIVERSITY OF WILLOW (*SALIX* SP.) GENOTYPES USING SCOT MOLECULAR MARKERS

Marina SAMIEE[1], Monica HÂRŢA[2], Doina CLAPA[2], Mihai BOTU[1]

[1]University of Craiova, 13 A.I. Cuza Street, 200585, Craiova, Dolj, Romania
[2]University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, 3-5 Mănăştur Street, 400372, Cluj-Napoca, Romania

Corresponding author email: monica.harta@usamvcluj.ro

Abstract

In this study, eleven willow genotypes from local populations and foreign varieties grown in an experimental field were morphologically and genetically evaluated to establish their genetic diversity. The results of this study show that the local clonal selections Caracal 101-103 recorded the best results for most of the analysed morphological characters. Out of 25 SCoT primers tested for genetic diversity analysis, 12 primers generated 113 polymorphic bands. The lowest number (8) was obtained with primers SCoT1, SCoT3, SCoT21 and SCoT23. The highest number (13) of polymorphic bands was amplified with the primer SCoT13. The percentage of polymorphism ranged from 72.72% (SCoT 1 and SCoT 21) to 100.0% (SCoT 13) with a mean value of 83.69%. The UPGMA dendrogram grouped willow genotypes into two main clusters. The results of the cluster analysis were then confirmed by the PCoA analysis which explained 61.76 % of the total variation. In conclusion, this study provides valuable data regarding the genetic diversity of willow genotypes that can be selected and used in future breeding programs.

Key words*: local genotypes, cultivars, morphometry, DNA-markers, genetic diversity.*

LANDSCAPE ARCHITECTURE IN THE REPUBLIC OF MOLDOVA THROUGH THE PRISM OF SOME HISTORICAL PERIODS

Irina SFECLA[1], Victor SFECLA[2]

[1]"Alexandru Ciubotaru" National Botanical Garden (Institute),
18 Pădurii Str., MD-2002 Chișinău, Republic of Moldova
[2]Technical University of Moldova, 168 Stefan cel Mare Blvd, Chișinău,
Republic of Moldova

Corresponding author email: irinasfecla@gmail.com

Abstract

Through the research covered in this paper, an attempt was made to describe the landscape-architectural structure of some parks created on the territory of the Republic of Moldova in different historical periods, in terms of the influence of Russian architecture. The study was focused on some parks from the territory of the Republic of Moldova. The paper presents the history of the foundation, describes the landscape-architectural style and similarities between Russian landscape architecture and some parks created in the Republic of Moldova in several historical periods (the Period of Bessarabia as part of the Russian Empire (1812-1917); the Period of the Moldavian Soviet Socialist Republic (1944-1991); the Period of Independence of the Republic of Moldova (1991- present). The history of the foundation of the parks and the influence of Russian architecture were studied and analyzed on the basis of archival materials and new publications.

Key words*: historical periods, landscape architecture, Republic of Moldova.*

GRASSES WITH ORNAMENTAL POTENTIAL UNDER EX SITU CONDITIONS

Tatiana SÎRBU, Doina ȘABAROV, Tamara RUDI

"Alexandru Ciubotaru" National Botanical Garden (Institute),
18 Pădurii Str., MD-2002 Chișinău, Republic of Moldova

Corresponding author email: tatianaonica17@gmail.com

Abstract

The paper elucidates the current taxonomic and phytogeographical situation of the representatives of the Poaceae family from the collections of ornamental plants of the National Botanical Garden (Institute) "Al. Ciubotaru". Grasses include 22 genera, 30 species and 27 cultivars. More numerous is the genus Miscanthus Andersss.: 2 species and 18 cultivars. Most - perennials, rhizomiferous geophytes, and 8 species - annual terophytes. According to the phytogeographical analysis, the studied pockets belong to the following geoelements: Eurasian (47%), Mediterranean (16%), North American (9%), Eurosiberian (6%), Asian (16%), Pontic-Caucasian (3%), Circumpolar (3%). Through the habitus, the foliage, the color and the long period of vegetation, the grasses become popular for the phytoimprovement of the environment. The research was conducted within the project 20.80009.7007.14.: "Research on mobilizing plant diversity with ornamental potential for ex situ conservation".

Key words*: Poaceae Barnhart, ex situ conservation, phytogeographical and taxonomic analysis, propagation, phenology, Republic of Moldova.*

COMPARING DIFFERENT GRASS SPECIES, VARIETIES AND GRASS MIXTURES IN THE ENVIRONMENTAL CONDITIONS OF TÂRGU MUREȘ

Zsolt SZEKELY-VARGA, Reimond SIMPF, Endre KENTELKY*, Klára BENEDEK, Katalin MOLNÁR, Béla BIRÓ-JANKA, Adalbert BALOG

Sapientia Hungarian University of Transylvania, Faculty of Technical and Human Sciences, Department of Horticulture, Calea Sighișoarei 2, 540485 Târgu Mureș, Romania

Corresponding author emails: kentelky@ms.sapientia.ro, adalbert.balog@ms.sapientia.ro

Abstract

Worldwide the land surface is covered 25–30% by grass. Our objectives were to determine the germination percentage, germination capacity, height, width, softness, disease resistance, density, trampling tolerance, fresh green weight of the different grass species, varieties and grass mixtures under the environmental conditions of Târgu Mures. For the experiment we have selected Festuca arundinacea 'Green dwarf', Festuca arundinacea 'Patron', Festuca arundinacea 'Titanium', Festuca arundinacea 'Greystone', Festuca arundinacea 'Asterix', Festuca rubra commutata 'Rushmore', Festuca rubra rubra 'Livision', Poa pratensis 'Arrowhead', Poa pratensis 'Evora', Poa pratensis 'Baron' varieties. Moreover, four types of lawn mixtures were analysed in the present study: which is suitable for full sunshine and shady places, for regenerative lawn and lawn mixture for sport fields. From the data obtained could be concluded that which selection of grass mixtures suitable for different purposes: ornamental, trampling tolerant. In conclusion, the present work strengthens the possibility of choosing the appropriate grass species, varieties and grass mixtures.

Key words*: grass, lawn mixtures, varieties.*

INNOVATIVE RESEARCH ON GERMINATION OF BASIL SEEDS (*OCIMUM* SPP.)

Dumitru-Mitel TOMA[1], Floarea BURNICHI[1], Emilian MIREA[1], Florin TOMA[2]

[1]Vegetable Research and Development Station Buzău, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: mitel.toma25@gmail.com

Abstract

Healing with herbs is as old as mankind. The connection between man and his search for remedies in nature dates back to the distant past, of which there is ample evidence. One of the plants often used for this purpose is the basil (Ocimum spp), a plant with multiple values: biblical, medicinal, ornamental, culinary and social. In this regard, research has been conducted on the optimal method of seed germination in this species. The tests were performed at the Vegetable Research and Development Station Buzau. The experiment involved the establishment of eight study variants, with three repetitions each. The results are statistically assured. Following the research on the germination faculty, it was found that in the variant where aghiasma (Holy water) was used for wetting the seeds, there was the highest number of germs of the species under observation. In conclusion, by establishing the optimal method of twinning basil seeds, producers will benefit from the economic efficiency of the crop, and the finished product will reach the final consumer at a low price and high quality.

Key words*: basil, germination, Holy water, production, quality.*

PHOTOSYNTHETIC EFFICIENCY OF *FESTUCA GLAUCA FESTINA* AND *STACHYS BYZANTINA* PLANTS IN AN OUTDOOR VERTICAL GARDEN UNDER SILICON APPLICATION CONDITION

Zaneta TUCHOWSKA[1], Barbara BORAWSKA-JARMUŁOWICZ[2], Piotr DABROWSKI[3], Henryk KOCIEL[4]

[1]Warsaw University of Life Sciences, Nowoursynowska 166, 02-787 Warsaw, Poland
[2]Department of Agronomy, Faculty of Agriculture and Biology, SGGW, Nowoursynowska 166, 02-787 Warsaw, Poland
[3]Department of Environmental Improvement, Faculty of Civil and Environmental Engi, Nowoursynowska 166, 02-787 Warsaw, Poland
[4]Firma Uslugowa OGROD Maria Kociel, Rolnicza 59, 21-400 Lukow, Poland

Corresponding author email: zaneta_tuchowska@sggw.edu.pl

Abstract

The low share of urban greenery is a problem for many cities. The solution can be vertical gardens. The main challenge is the correct selection of plants, that will be attractive and fulfill their functions. It is therefore appropriate to carry out research on the use various methods and means of fertilization in order to improve the adaptation of plants to difficult habitat conditions. The aim of this study was to determine the photosynthetic performance of Festuca glauca and Stachys byzantina used in an outdoor vertical garden. A two-factorial experiment, was located in Łuków (Poland) in 2021. Two foliar silicon application options were included in the study: no application of silicon and application of silicon. Silicon NanoFYT Si® was used two weeks before the measurements. Plant photosynthetic performance - FV/FM index, PIABS and PITOTAL were assessed in the months of VI-XI.2021, every 30 days using HandyPEA. The study showed higher values of chlorophyll fluorescence parameters, especially FV/FM and PIABS in Festuca glauca `Festina`, while PITOTAL in Stachys byzantina plants. The application of silicon had a beneficial effect.

Key words*: environmental protection and design, green infrastructure, green walls, plant physiological parameters, stress conditions.*

MORPHOLOGICAL AND PHYSIOLOGICAL PARTICULARITIES OF FIVE DAHLIA CULTIVARS

Elena Cristina ȚURLEA (CIOBANU)[1], Liliana BĂDULESCU[1, 2], Monica Luminița BADEA[1], Mihai Ioan CIOBANU[1], Florin TOMA[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]Reasearch 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: ciobanuelenacristina@yahoo.com

Abstract

The paper presents the results of the morphological characteristics of Dahlia leaves (leaves area, the perimeter, the length of the leaves, width of leaf), physiological processes (photosynthesis, respiration and transpiration) and chlorophyll content determined at 5 Dahlia cultivars 'Topmix Red', 'Hy Pimento', 'Babylon Red', 'Marble Ball' and 'Thomas Edison'. The average leaf area has varied from 5.35 cm^2 ('Topmix Red') to 68.41 cm^2 ('Babylon Red'). As for the perimeter, 'Babylon Red' had the highest value (67.49 cm) and 'Topmix Red' had the lowest value (9.72 cm). The length of the leaves was between 14.19 cm for 'Babylon Red' and 4.43 cm for 'Topmix Red'. The width of the leaves was between 10,18 cm for 'Babylon Red' variant and 2.26 cm for 'Topmix Red'.The intensity of photosynthesis varied between 12.85 µmol CO_2 $m^{-2}s^{-1}$ for 'Babylon Red' and 15.24 µmol CO_2 $m^{-2}s^{-1}$ for 'Topmix Red', intensity of transpiration 4.69 mmol H_2O $m^{-2}s^{-1}$ for 'Hy Pimento' and 6.17 mmol H_2O $m^{-2}s^{-1}$ for 'Thomas Edison', intensity respiration 7.46 µmol CO_2 $m^{-2}s^{-1}$ for 'Hy Pimento' and 13.43 µmol CO_2 $m^{-2}s^{-1}$ to 'Marble Ball'. The total chlorophyll content was higher in the case of 'Marble Ball', at a value of 163.90 mg/100 g, and the smallest quantity was recorded for the 'Babylon Red' at the value of 102.15 mg/100 g.

Key words*: chlorophyll, leaf morphology, photosynthesis, respiration, transpiration.*

ASPECTS REGARDING THE ANATOMY OF THE STEM AND LIFETIME AS CUT FLOWERS OF SOME DAHLIAS CULTIVARS

Elena Cristina ȚURLEA (CIOBANU), Mihaela GEORGESCU, Monica Luminița BADEA, Mihai Ioan CIOBANU, Sorina PETRA, Florin TOMA

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

Corresponding author email: ciobanuelenacristina@yahoo.com

Abstract

Plants of the Dahlia genus are particularly valued for their wide variety of shapes and colors both as cultivated plants and as cut flowers thus increasing the interest for the introduction in the culture of cultivars with great decorative value and great resistance as cut flowers. The work presents anatomical aspects, but also particularities regarding the life span of cut flowers in preservation solutions for the cultivars 'Topmix Red', 'Hy Pimento', 'Babylon Red', 'Marble Ball' and 'Thomas Edison'. The objective of this study was to analyze dahlia varieties both from the anatomical point of view and the preservation of cut flowers in vases using different preservation solutions to establish a correlation between the diameter of xylem vessels and cut flower life. The diameter of the xylem vessels does not seem to influence the life span of the cut flowers, regardless of the solution used in the conditions of this experiment. The Quick dip and eZDose conservation solution increased the lifespan of the varieties studied compared to the other conservation solutions used.

Key words: *cross-sections, cut flowers, dahlia, flower longevity, xylem.*

THE NORWAY MAPLE APHID - *PERIPHYLLUS LYROPICTUS* (KESSLER) (HEMIPTERA: APHIDIDAE): A NEW PEST OF *ACER PLATANOIDES* IN WESTERN ROMANIA

Ana-Maria VÎRTEIU, Ioana GROZEA

University of Life Science "King Mihai I" from Timişoara,
119 Calea Aradului Street, Timişoara, Romania

Corresponding author emails: anamaria.badea@gmail.com,
ioanagrozea@usab-tm.ro

Abstract

Periphyllus lyropictus (Kessler) was collected for the first time in the green urban landscape of Timisoara, Western Romania. Small colonies with oviparous female and alate males of the Norway maple aphid were recorded on Acer platanoides trees between October and November 2022. This aphid species is also reported for the first time in Romania. The native range of the species includes Europe and Asia. The aim of this paper was to provide information on potential damage to host plants and some morphological characteristics, original images being presented. Some reference data on the biology and distribution are highlighted. Norway maple aphid populations were found in each of the 6 parks and private gardens surveyed and in 115 of the total 180 trees analyzed.

Key words*: Periphyllus lyropictus, aphid, Acer platanoides, western Romania.*

THE PRESENCE OF ZINC IN CULTURAL SOILS ADJACENT TO URBAN AGGLOMERATIONS AND THEIR IMPENDING POLLUTION

Mariana VOLF, Nicoleta Luminiţa PARASCHIV, Elena-Liliana CHELARIU, Elena Diana BOLOHAN

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

Corresponding author emails: luminico2003@yahoo.com, julia@uaiasi.ro

Abstract

It is well known that in the upper horizon of Romanian soils with agricultural use, the total Zn content is between 11 and 97 ppm, with predominant values in the range of 40-70 ppm. The psammosols, poor in mineral and organic colloids, have the lowest Zn contents, below 20 ppm, while vertisols and vertisols with clayey texture have the highest zinc contents, 80-90 ppm. The work is based on the analysis data of the Zn content of the soils of several locations bordering the city of Iasi and presents them, in correlation with the influencing agro-eco-pedological factors. In the study undertaken, the determined values are between 89.21 and 98.67µg Zn / g The conclusions refer to the interpretation of these values, through the lens of the maximum allowed limits, and ways to limit pollution with this element are also suggested

Key words*: heavy metal, pollution, soil.*

MISCELLANEOUS

DYNAMICS OF NUTRIENT ELEMENTS IN THE SOIL IN THE CULTIVATION OF DIFFERENT RASPBERRY GENOTYPES

Stanislava ATANASOVA[1], Lubov PLESHKUTSA[1], Maria GEORGIEVA[2], Diyan GEORGIEV[2], Evlogi MARKOV[3]

[1]Trakia University, 6015 Stara Zagora, Bulgaria
[2]Research Institute of Mountain Stockbreeding and Agriculture, Troyan, Bulgaria
[3]Institute of Soil Science, Agrotechnologies and Plant Protection "Nikola Pushkarov", Bulgaria

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

Abstract:

The present study follows the dynamics of nutrient elements in the soil of a raspberry plantation during the period of blossoming and fruit harvesting. The scientific experiment was conducted in the period 2018-2020 in a collection plantation of the Research Institute of Mountain Stockbreeding and Agriculture in Troyan with four raspberry genotypes, such as Willamette, Meeker, Samodiva and Magdalena. The soils of the region are gray forest, moderately eroded, low in humus and prone to waterlogging. The content of basic nutrients (nitrogen, phosphorus, potassium), humus and pH in the 0-20 cm and 20-40 cm soil layers was analyzed. The results show that the highest nitrogen content was registered the surface soil layer with 89.77 mg/kg during the blossoming phenophase in 2019.The amount of phosphorus varied widely 2.6 -6.20 mg/100 g. The highest potassium content (28.66 mg/100 g) was found again in the surface soil layer during blossoming of the 2020 raspberry plants.

Key words: *raspberries, varieties, soils, agrotechnics, nutritional elements.*

PRELIMINARY EVALUATION ON GETTING SPROUTS IN SORREL ON DIFFERENT SUBSTRATES

Lavinia-Diana-Nicoleta BARBU[1, 4], Oana LIVADARIU[1], Oana-Alina Boiu-SICUIA[1, 4], Carmen Gabriela CONSTANTIN[2], Aurora DOBRIN[2], Violeta Alexandra ION[2], Oana Arabela Cosmina VENAT[2], Cătălina Ioana NICOLAE[2], Monica BADEA[3], Adrian PETICILĂ[2], Viorica LAGUNOVSCHI LUCHIAN[3], Narcisa-Elena BĂBEANU[1]

[1]Faculty of Biotechnology, 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
[3]Faculty of Horticulture, University of Agronomic Sciences and Veterinary Medicine of Bucharest of Bucharest, 59 Mărăști Blvd., District 1, Bucharest, Romania
[4]Research-Development Institute for Plant Protection, 8 Ion Ionescu de la Brad Blvd., District 1, Bucharest, Romania

Corresponding author email: oana.livadariu@biotehnologii.usamv.ro

Abstract

In recent years, there is an increasing trend worldwide in consuming microgreens. Due to their benefits for human health, less growing requirements, high nutritional composition and their versatility in various cuisines, microgreens become of great interest. Therefore, there is a need in finding sustainable possibilities for obtaining such sources, rich in health-promoting compounds. Thereby, the objective of this paper is to present the results of an experimental design that involves the obtaining of Rumex acetosa L. (sorrel) microplants on different cultivation substrates. The biological material consisted of seeds of sorrel, and six different substrates varying the ratio between perlite, banana peel, and agar. The experiments were performed in a non-aseptic system. After 14 days, the seed germination capacity and the number of leaves were recorded. Also, several physicochemical and biochemical analyses performed for the resulting sprouts, such as micro and macronutrients content, assimilatory pigments, and dry matter (DM). The most promising cultivation substrates for sorrel sprouts are perlite and the mixtures of perlite and agar. In terms of sprouts quality, both variant 2 (perlite 75% with agar 25%) and variant 4 (perlite 25% with agar 75%) of cultivation were highlighted.

Key words*: cultivation substrates, germination, nutrients, quality of sprouts, sorrel.*

RESEARCH ON THE ARTHROPOD SPECIES EXISTING IN POTATO CROPS

Paul BUTNĂRAŞU, Mihai TĂLMACIU, Nela TĂLMACIU, Monica HEREA

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

Corresponding author email: mtalmaciu@uaiasi.ro

Abstract

The research was carried out in 2022 in a potato crop in the Radauti-Suceava area, at the Varieties Testing Center, subordinate to the State Institute for Varieties Testing and Registration, Bucharest. To collect the material, were used Barber soil traps of the wet type, in which a 20% sodium chloride (NaCl) solution was placed. Were used 3 variants, each with 6 repetitions, as follows: V1, in which treatments were applied against pests, with products approved for organic agriculture, V2, in which treatments were applied against pathogens and pests in conventional agriculture, V3, in which no pest control treatment was applied. Collections of the captured material were made during the months of June, July and the first decade of August. The collected arthropods belong to the following groups: Insects: wasps, ants, flies, bedbugs, plant lice, cicadas, etc., Mites, Millipedes, Isopods, etc.

Key words*: potato, pests, arthropods, variants, traps.*

RESEARCH ON THE SPECIES OF HEXAPODES EXISTING IN POTATO CROPS

Paul BUTNĂRAŞU, Mihai TĂLMACIU, Nela TĂLMACIU[1], Monica HEREA

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

Corresponding author emails: mtalmaciu@yahoo.fr, monica28is@yahoo.com

Abstract

To collect the material, were used Barber soil traps of the wet type, in which a 20% sodium chloride (NaCl) solution was placed.Were used 3 variants, each with 6 repetitions, as follows:V1, in which treatments were applied against pests, with products approved for organic agriculture; V2, in which treatments were applied against pathogens and pests in conventional agriculture; V3, in which no pest control treatment was applied.Collections of the captured material were made during the months of June, July and the first decade of August.The insect species collected belong to the following orders: Coleoptera, Hymenoptera, Diptera, Homoptera, Heteroptera, etc.

Key words*: Barber traps, variants, tratament, species, Coleoptera.*

RESEARCH ON THE NUTRITIONAL VALUE, BIOACTIVE COMPOUNDS CONTENT AND ANTIOXIDANT CAPACITY OF SPIRULINA

Luminiţa CATANĂ[1], Monica CATANĂ[1], Florica CONSTANTINESCU[1], Anda-Graţiela BURNETE[1], Adrian Constantin ASĂNICĂ[2]

[1]National Research & Development Institute for Food Bioresources, IBA Bucharest, 6 DinuVintilă Street, Bucharest, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Marasti Blvd, District 1, Bucharest, Romania

Corresponding author email: mcatana1965@gmail.com

Abstract

Spirulina is a blue-green microalga, rich in biactive compounds and nutrients. The high nutritional value and therapeutic potential of Spirulina have increased its global importance and the demand to make healthy food products fortified with this microalgae.The aim of this work was to determine the nutritional value, bioactive compounds and antioxidant capacity of Spirulina. The Spirulina samples analyzed stand out for their protein content (57.5-65.9%), total fiber (4.2 - 8.5%), total ash (6.83 -7.47%), vitamins (vitamin C: 55.45-82.73 mg/100 g; vitamin B1: 0.627-1.08 mg/100 g; vitamin B2: 2.12-3.84 mg/100 g; vitamin B3 (Niacin): 8.21- 12.83 mg/100 g; vitamin B5: 2.15-3.05 mg/100 g; vitamin B6: 0.653-0.875 mg/100 g; vitamin B9: 0.327-0.588 mg/100 g; vitamin B12: 0.105-0.127 mg/100 g), total polyphenols 385.65 -627.23 mg GAE/100 g), mineral elements (Na:85.77-120.45 mg/100 g; K:1385.37-1678.72 mg/1100 g; Ca:850- 1185.57 mg/100 g; Mg: 205.34-248.93 mg/100 g; Fe: 21.32-46.58 mg/100 g; Zn: 1.23-1.85 mg/100 g). Due to its complex biochemical composition, Spirulina powder has antioxidant and therapeutic potential and can also be used for food fortification.

Key words*: Spirulina, microalgae, nutrients, bioactive compounds, antioxidant capacity.*

RESEARCH ON THE CAPITALIZATION OF THE NUTRITIONAL AND BIOACTIVE POTENTIAL OF CAULIFLOWER LEAVES IN THE CIRCULAR ECONOMY CONTEXT

Monica CATANĂ[1], Luminita CATANĂ[1], Adrian Constantin ASĂNICĂ[2], Monica Alexandra DARA[1], Florica CONSTANTINESCU[1]

[1]National Research & Development Institute for Food Bioresources, IBA Bucharest, 6 Dinu Vintila Street, Bucharest, Romania
[2]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Marasti Blvd, District 1, Bucharest, Romania

Corresponding author email: adrian.asanica@horticultura-bucuresti.ro

Abstract

Globally, it is estimated that a third of all food produced is lost. The objective of this work was to capitalize on the nutritional and bioactive potential of cauliflower waste (leaves), in order to obtain a functional ingredient with high nutritional value and antioxidant potential. This functional ingredient is presented in the form of a homogeneous, microbiologically stable powder and stands out for its content in protein (28.72-29.95%), ash (10.39-11.23%), glucosinolates (240.23-259.65 mmol/g s.u.) total fiber (32.86-34.90%), vitamin C (76.50-89.44 mg/100 g), β-carotene (39.45 -47.21 mg/100 g), total phenolic compounds (5.75-6.12 mg GAE/g s.u.), mineral elements (Fe: 40.75-51.15 mg/100 g; K: 3865.52-4178.21 mg/100g; Ca: 772.23-812.21 mg/100 g: Mg: 120.23-145.85 mg/100 g; Zn: 5.45-7.78 mg/100 g). Due to the high antioxidant content, the functional ingredient obtained from cauliflower leaves has an antioxidant capacity: 96.32-105.53 µmol TE/g s.u.). Due to its complex biochemical composition and antioxidant capacity, this functional ingredient obtained from cauliflower leaves can be used in the food fortification process.

Key words*: cauliflower, leaves, functional ingredient, antioxidant capacity.*

ANTIMICROBIAL ACTIVITY OF NATURAL CARBOHYDRATE POLYMERS AND THEIR MECHANISM OF ACTION - A REVIEW

Aurora DOBRIN[1], Carmen Gabriela Constantin[1], Gabriela POPA[2]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, Research Center for Studies of Food Quality and Agricultural Products, 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: carmen.constantin@qlab.usamv.ro

Abstract

Microbial infections represent a concerning health issue, and antibiotic-resistant pathogens represent a priority all over the world, having a negative impact on life quality and the economy. Therefore, there is an increase in focus on natural and renewable resources capable to inhibit microbial proliferation and their adherence on the surfaces. The mechanism involved in antimicrobial action and plant polysaccharides is still not clear. In this study, the plant polysaccharides extracted from different organs of plants, extraction methods, antibacterial and antiviral spectra and their mechanisms were reviewed. This review aims to provide a screening that could enhance the application of polysaccharides extracted from plants as antimicrobial agents related to the urgent need for natural alternative approaches to combat antimicrobial drug resistance (AMR).

Key words*: AMR; antioxidants; pathogens; plants green polymers; polysaccharides.*

RESEARCH ON THE EFFICACY OF SOME BIOFUNGICIDES APPLIED TO SOME WAREHOUSE DISEASES UNDER LABORATORY CONDITIONS

Alexandra GEORGESCU, Constantina Lenuța CHIRA, Elena Maria DRĂGHICI , Maria BICAN , Mădălin CHIUOARU , Ioana KLEE , Daniel NAGY, Ligia ION

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

Corresponding author email: alexandra.georgescu.1997@gmail.com

Abstract

Based on the premise of the exaggerated price of pesticides and fungicides over the last year, in Romania, the possibility of applying preventive and control treatments on the main fungal diseases attacking cultivated plants would be beneficial. The Ministry of Agriculture has proposed through the Government Plan 2021-2024 to develop Programmes for the development of organic agriculture that will actively contribute to the protection of the environment and to food safety. This study aims to obtain high quality biofungicides but also to follow the efficacy of treatments consisting three biofungicides in three different doses together with a biological agent and untreated against the pathogen, in vitro. The results of the biofungicide treatments showed that in all three cases a reduction of the surface area of infection on the in vitro culture medium was evidenced, with the best results being recorded for Botrytis cinerea and Venturia inaequalis.

Key words*: biofungicides, in vitro, Venturia, Botrytis, trends.*

THE EVOLUTION OF THE FLORISTIC COMPOSITION OF AN ECOSYSTEM IN THE AREA OF SANDS IN SOUTHWEST ROMANIA UNDER THE INFLUENCE OF ENVIRONMENTAL FACTORS

Daniela Ioana ILIE [1], Daniel RĂDUȚOIU[2], Sina COSMULESCU[2]

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

Corresponding author emails: oanailie268@yahoo.com, radutoiu02daniel@gmail.com, sinacosmulescu@hotmail.com

Abstract

The present work aimed to analyze the influence of climate change on the floristic composition of an ecosystem in the sandy area located in southwestern Romania, namely in the Dăbuleni area, Dolj county. The research was carried out on areas where the influence of the zoo-anthropogenic factor is very low or absent and showed that changes in floristic composition occurred within these ecosystems. The observations made allowed the creation of a floristic list that was compared with the literature. Although the number of species has been reduced, the herbaceous cover has nevertheless been well covered. The dominant species which give the physiognomy of these sites belong to the category of those which are not characteristic of sandy soils but which have adapted very well to these conditions. Acclimatization of other species, brought from other regions, has not been possible. Typical psammophilous species such as Polygonum arenarium, Mollugo cerviana, Silene conica, Tragus racemosus, Plantago arenaria, Jasione heldreichii, Achillea ochroleuca, Centaurea soltitialis ssp. solstitialis, etc., prefer open sites because they do not seem to tolerate competition with other species.

Key words*: spontaneous flora, change climatic, Oltenia, Romania.*

LOCAL BIODIVERSITY: IMPORTANCE, DIVERSITY AND IMPACT. A REVIEW

Daniela Ioana ILIE[1], Sina Niculina COSMULESCU[2]

[1]SCDCPN Dăbuleni, 217 Petre Baniță Street, Călărasi, Romania
[2]University of Craiova, Faculty of Horticulture, Alexandru Ioan Cuza 13, Craiova, Romania

Corresponding author email: sinacosmulescu@hotmail.com

Abstract

To promote sustainability, knowledge and conservation of biodiversity in urban green spaces requires clarification of the diversity of spontaneous species in green spaces and assessment of the impact of local biodiversity in these spaces. The following is a review of these questions and the answers provided in the literature. Based on the research carried out, it is considered that green spaces contain unique and useful biodiversity resulting from their management. The biodiversity of outdoor improvement is a key feature of the urban landscape, offering numerous benefits, and the conservation of this biodiversity in urban green spaces is fundamental and requires an integrated approach. However, urbanisation usually has a detrimental influence on local species` diversity. Spontaneous plants and spontaneous plant ecosystems can be considered ecological assets when considering their tolerance of urban environments, their potential to be highly diverse and to support an unique wildlife, and their contribution to providing regulating ecosystem functions and services.

Key words*: biodiversity, green spaces, sustainability.*

EVALUATION OF PIMIENTO BLANCO CULTIVARS (*CAPSICUM ANNUUM L.*) FROM VILLENA UNDER ORGANIC CONDITIONS

Marisa JIMéNEZ PéREZ, Ana María ADALID MARTíNEZ, Estela MORENO PERIS, Ana María FITA, Adrián RODRíGUEZ BURRUEZO

COMAV Institute - Universitat Politècnica de València, Camino de Vera, s/n, Valencia, Spain

Corresponding author email: majipe1@posgrado.upv.es

Abstract

The Capsicum Team of COMAV Institute has been collaborating with farmers from Villena (Spain) to evaluate and recover a kind of wax pepper that is highly valued in the area. Thereby, five accessions of the "Pimiento Blanco", preserved by farmers from Villena (B_1, M_1, S_1, S_2, Z_1) have been evaluated and compared to commercial hybrids under organic farming management. Vitamin C, fructose, glucose and luteolin contents were measured using HPLC, as well as the yield per plant. Vitamin C levels were significantly higher in B_1 compared to F1 hybrids. Moreover, M_1 showed statistically higher fructose and glucose levels respect to commercial hybrids. Also, luteolin was statistically higher in Z_1 in comparison with the commercial cultivars. Finally, yield per plant did not show remarkable differences between genotypes. These results show the potential of these local materials to be used under low input conditions and to increase the biodiversity of our agrifood sector. Thanks to the grant CIPROM/2021/020 (GVA), the AGROALNEXT programme (AGROALNEXT/2022/027, GVA), MCIN (NextGenerationEU, PRTR-C17.I1) and the grant of M. Jiménez (M.Universities, FPU20/03486).

Key words*: luteolin, organic farming, sugars, vitamin C, wax peppers.*

EVALUATION OF THE ORGANOLEPTIC CHARACTERISTICS AND NUTRIENTS OF AROMATIC/MEDICINAL PLANTS FROM URBAN HORTICULTURE

Cristina Electra MÂCNEA, Violeta Alexandra ION, Dan POPESCU, Adrian ASĂNICĂ

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

Corresponding author email: kristinamaknea@gmail.com

Abstract

Cultivation of aromatic/medicinal plants (MAPs) is part of urban gardening and landscape architecture while some of them are widespread in the medical industry due to the nutrients they contain. In this work, an organoleptic evaluation of infusions and condiments from 25 MAPs was carried out, with the participation of 45 different tasters. The bioactive compounds in the decoctions of some MAPs were then evaluated. The plants selected were grown in a greenhouse, through urban co-cultivation, in Bucharest and Thessaloniki. The appearance, smell, taste and aroma were assessed from the organoleptic characteristics, while the results obtained were processed with the SPSS statistical program. The DPPH and Folin Ciocalteu methods were used to measure antioxidant and total phenolic concentration. The purpose of the work is to examine the relationship between the organoleptic characteristics and the nutritional elements of some MAPs. Also, it is sought to form an objective image regarding the role and the way of the use of MAPs so that they become acceptable to consumers, in their daily diet.

Key words*: aromatic/medicinal plants, organoleptic evaluation, bioactive compounds, urban horticulture.*

A REVIEW OF THE DECORATIVE AND UVOLOGICAL POTENTIAL WITHIN THE *VITACEAE* FAMILY

Liviu MĂRĂCINEANU, Nicolae GIUGEA, Ramona CĂPRUCIU

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

Corresponding author email: maracineanulc@yahoo.com

Abstract

The Vitaceae family includes many genus and species. Some are fossils, others have various uses and others have recently come to the attention of researchers. The paper analyzes these aspects through the prism of achievements in the field and identifies possible directions for their continuation. For this, the food characteristics of the various species are taken into account, as well as their decorative, medicinal or other potential. In Romania, some of the species are known and used, others can be taken over and studied in order to capitalize on their properties. The purpose of this paper is to bring this information to the attention of interested persons.

Key words*: vitaceae, uvology, ornamental plants.*

UTILIZATION OF INDUSTRIAL ROSE AND LAVENDER SOLID BY-PRODUCTS FOR REMOVAL OF 2-NAPHTOL ORANGE

Gergana MAROVSKA, Anton SLAVOV

Department of Organic Chemistry and Inorganic Chemistry,
Technological Faculty, University of Food Technologies,
26 Maritsa Blvd., Plovdiv 4002, Bulgaria

Corresponding author email: gerii_vlaseva@abv.bg

Abstract

Lavender (Lavandula angustifolia Mill*.) and rose (Rosa Damascena* Mill*.) industrial by-products were used as natural, biodegradable, readily available and cheap bioadsorbents to remove the azo dye 2-naphthol orange from waste waters. The influence of contact time, pH, adsorbent amount, initial dye concentration, temperature, sonication and adsorbent particle size was investigated. The acidic medium favored the adsorption and at pH 1.5, 99% efficiency (for lavender as adsorbent) was achieved. The results of the present study confirmed the successful application of essential oil industrial lavender and rose by-products as bioadsorbents for efficient removal of 2-naphtol orange from waste waters as a new method for valorization of the by-products from agricultural industry.*

Key words*: rose, lavender, by-products, 2-naphthol orange, adsorption.*

THE INFLUENCE OF QUANTUM STRUCTURED WATER ON MICROBIAL DIVERSITY IN RHIZOSPHERE OF TOMATO AND ASSESSMENT OF BIOLOGICAL QUALITY OF PLANTS BY IMAGE-FORMING METHODS

Gabi-Mirela MATEI[1], Sorin MATEI[1], Florin ENACHE[2], 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, 59 Mărăşti Blvd, District 1, Bucharest, Romania

Corresponding author email: so_matei602003@yahoo.com

Abstract

The structured water is obtained by quantum technology, exclusively based on natural elements, under the influence of electromagnetic field with a magnitude of waves in the order of 10^{-40}. The aim of this paper is to present the results of research carried out in greenhouse conditions to assess the influence of irrigation with quantum structured water, as compared with irrigation with tap water, on biodiversity and structure of microbial communities in the rhizosphere of tomato (Solanum lycopersicum L.*) FLAVIOLA variety and to evaluate the biological quality of plants. The paper presents the total counts and species of bacteria and fungi estimated by the dilution plate method, diversity index of Shannon (H), equitability, and similarity index. The influence of structured water on plants height, accumulated fresh biomass, biological quality, and vitality are discussed comparatively with tap water using image-forming methods, namely biocrystallization, circular chromatography, and capillary dynamolysis by the evaluation of structures formed consequently to the reaction of plant extracts with certain inorganic salts.*

Key words*: tomato, biodiversity, microbial communities, quantum structured water, image-forming method.*

ENHANCING SOIL SUPPRESSIVENESS WITH CONJUGANTS REALIZED BETWEEN MICROBIAL SIDEROPHORES AND A FULVIC ACID FRACTION

Sorin MATEI, Gabi-Mirela MATEI

National Research-Development Institute for Soil Science, Agrochemistry and Environment, Bucharest, 61 Marasti Blvd, District 1, Bucharest, Romania

Corresponding author email: so_matei602003@yahoo.com

Abstract

The paper aims to select probiotic microorganisms capable of producing siderophores for iron chelation and to make conjugates with the water-soluble fulvic fraction of Mollic Gleysol (WRB), (0–20 cm). The biosynthetic performances of 5 strains of probiotic bacteria from the collection, belonging to genera Lactobacillus (LAB 41, LAB 62, LAB 57, LAB 83, LAB 69), isolated from different soil types, were evaluated in terms of siderophores production (CAS method), type (Arnow and Csaky tests) and complexation capacity. The probiotic strains produced amounts of siderophores between 97–158 µmol L^{-1} in 48–96 hours, of catecholate and hydroxymate type and of both types in the case of LAB 62, LAB 69 and LAB 83 strains. LAB 83 strain had the highest iron chelating capacity. The inhibition capacity of the conjugates was tested and evaluated on 3 phytopathogenic fungal isolates (P. expansum, A. flavus and A. ochraceus). Probiotic strains are promising for the purpose of producing siderophores but also for antifungal effect when these act as conjugants with a fulvic acid subfraction.

Key words*: siderophores, probiotic bacteria, fulvic acid subfraction, antifungal effect, conjugants.*

ANTHROPOGENIC INFLUENCE ON THE PHYSICAL PROPERTIES OF SOILS IN GREENHOUSES AND SOLARIA

Casiana MIHUȚ, Anișoara DUMA COPCEA, Lucian NIȚĂ, Adalbert OKROS, Daniela SCEDEI, Daniel POPA, Carmen DURĂU, Teodor MATEOC-SÎRB

University of Life Sciences "King Mihai I" from Timișoara, 300645, 119 Calea Aradului, Romania

Corresponding author emails: casiana_mihut@usab-tm.ro, anisoaradumacopcea@usab-tm.ro

Abstract

The paper addresses the influence that man has on the physical properties of the soil. Thus, a series of physical properties of soils in greenhouses and solaria are compared, namely: texture, structure, density, apparent density, total porosity, and aeration porosity following the application of organic and mineral fertilisers. The studies and research were carried out in greenhouses and solaria located in the western part of Romania (Timiș and Arad counties), in two localities, Giarmata and Secusigiu, cultivated with tomatoes (Solanum lycopersicum), peppers (Capsicum annuum) and eggplant (Solanum menongena) over a period of 9 years. The physical properties of soils were compared in 2016, 2019, and 2022, and the results showed that, in the solaria in which organic fertilisers (manure) were applied in doses of 40-60 t/ha, density values decreased from 1.12 g/m3 to 1.08 g/m3, apparent density from 1.65 g/m3 to 1.54 g/m3, while total porosity values increased from 62% to 67% and aeration porosity from 36% to 41%, thus falling within normal values of vegetable cultivation.

Key words*: anthropic influence, physical properties, protected areas.*

OPTIMUM TIME OF MEDICINAL PLANT EXTRACT APPLICATION ON TOMATO PLANTS INFESTED WITH MELOIDOGYNE INCOGNITA

Nicholus Mxolisi MNYAMBO, Moses TIMANA, Precious RANTHO, Rivoningo UBISI, Mmagadima SEBATI, Zakheleni DUBE

University of Mpumalanga, Mbombela, South Africa

Corresponding author email: nicholus9days@gmail.com

Abstract

One of the major vegetable pests is root knot nematodes. The withdrawal of synthetic nematicides has increased the demand for alternative control products. Therefore, the objective of the study was to determine whether time of applying T. elegans and M. angolensis plant extracts will vary on reducing M. incognita population densities and affect tomato plant growth. Tomato plants were planted under greenhouse conditions. The experiment was a 2 x 6 factorial laid out in a randomized complete block design with 5 replications. The first factor consisted of two plant extracts at 5g per plant and the second factor was made up of three application and inoculation times, positive control (fenamiphos), negative control and free growing tomato plant. Application of plant extract first in the soil reduced total nematodes similar to Nemacur and improve plant growth development. In conclusion, application of plant extract first suppressed nematodes population densities compared to other application time

Key words*: Application, Maerua angolensis, Meloidogyne incognita, inoculation, Tabernaemontana elegans*

EVALUATION OF PHENOTYPIC EXPRESSIVITY OF *SIDERITIS SCARDICA* VAR. OSSA, A NEW GENOTYPE ACCLIMATED AND BRED IN ROMANIA

Geanina NEGOŞANU[1], Adrian ASĂNICĂ[2], Costel VÎNĂTORU[1], Bianca MUŞAT[1], Camelia BRATU[1], Adrian PETICILĂ[2]

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

Corresponding author email: geanina.neacsu11@gmail.com

Abstract

BRGV Buzau owns a valuable collection of genotypes belonging to the Sideritis species, including the varieties: scardica, syriaca, hyssopifolia. S. scardica var. Ossa, coming from the mountain bearing the same name, has medicinal, gastronomic, pharmaceutical and ornamental value. Since 2002 it has been studied by researchers from Buzau and since 2019 it has been intensively introduced into cultivation at BRGV Buzau. The research has shown that var. Ossa has increased ecological plasticity to the soil and climate conditions in Romania. Special attention was paid to the biological isolation of the genotypes, knowing that it is an entomophilous plant preferred by insects, especially bees that can easily pollute the studied genetic resource. Following the evaluation of the BRGV collection, the G2 genotype was retained, which is the subject of this article. G2 shows distinct phenotypic expressivity, genetic stability and, very importantly, a strong, specific aroma. During the research, biometric determinations and phonological observations were carried out, with average values of 708g leaf mass and 278g flower stems, 32cm bush height, 71cm diameter.

Key words*: entomophily, ecological plasticity, habitat, germplasm collection, genetic stability,*

CONSERVATION OF PLANT GERMPLASM UNSING SYNTHETIC SEED TECHNOLOGY - REVIEW

Ioana-Cătălina NICOLAE[1, 2], Oana VENAT[1, 2], Adrian George PETICILĂ[1], Dorel HOZA[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: oana.venat@qlab.usamv.ro

Abstract

Plants are an essential resource for the existence of our planet. They sustain the ecosystems, produce the oxygen that is mandatory for the life of the other species and they are a source of fibres, medicine, materials and, the most important, they are our main source of food. In recent years, plant species are more and more threatened with extinction, due to urbanization, the development of various industries and habitat destruction. In addition to direct anthropological factors, natural habitats are endangered by climatic changes, changes that result in natural disasters as floods, bush fires, extreme temperatures and irregular precipitations. Conserving the plant species in in situ conditions, botanical gardens or field conditions exposes the germplasm to the risk of loss due to all these climatic accidents, and in vitro conservation techniques, such as synthetic seeds can provide a valuable solution for the future of our plant resources.

Key words*: artificial seed, encapsulation, germplasm, in vitro, micropropagation.*

PRELIMINARY STUDIES REGARDING THE IMPROVEMENT OF SOME VARIETIES OF *MARJORANA HORTENSIS*

Auraş NIŢĂ[1], Nicoleta RADU[1], Floarea BURNICHI[2], Cătălina VOAIDES[1], Narcisa BĂBEANU[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania
[2]Vegetable Research Development Station Buzau, 23 Mesteacanului Street, Buzău, Romania

Corresponding author email: nicoleta.radu@biotehnologii.usamv.ro

Abstract

Majorana hortensis is a perennial herbaceous plant, native to North Africa and Southwest Asia with sweet aromas of pine and citrus. The plant contains valuable active principles such as polyphenolic compounds; monoterpenes, sesquiterpenes macro and microelements, pectins, phytoncides, and vitamins (due to which it has multiple uses. As a result, the culture of Majorana hortensis is used in dry form in the food industry in the form of medicinal bioproducts, or in the form of biopreparations intended for plant protection, due to its content in bioactive principles, that inhibit the development of nematodes, defoliating insects and phytopathogenic microorganisms Due to increased interest in the bioproducts derived from Majorana hortensis, different varieties of marjoram currently in the SCDL Buzau collection, were introduced in an improvement process, to obtain varieties with improved properties. The results obtained in the first year are presented in the form of biometric data characteristic of the most promising varieties.

Key words*: Majorana hortensis, bioactive compounds, biometric data, new variety.*

APPLICATION OF SUPERABSORBENT POLYMERS IN THE AGRICULTURE AND THE IMPORTANCE OF THEIR BIODEGRADABILITY - A REVIEW

Ion NIȚU, Amalia Carmen MITELUȚ

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

Corresponding author email: nituion.11@yahoo.com

Abstract

This article aims to bring to light a relatively new strategy to ameliorate some problems that the agricultural sector faces in the current situation at a global level, such as water scarcity, drought, continuous degenerative processes of the soil or even the diseases caused by plant pests. One of the novel solutions that can be applied to balance the current situation is represented by the using of biodegradable superabsorbent polymers, due to their capacity, representing a reservoir able to store water, nutrients, or pesticides and then release them a constant flow, ensuring an optimal and beneficial ratio at the soil and plant level. They have numerous beneficial properties and advantages, being found in a multitude of fields, one of the most critical properties being represented by their biodegradability. Currently, the most "green" methods are being sought for obtaining these superabsorbents polymers to be used on a large scale and presenting a ratio of biodegradation as high as possible and no ecotoxicity after their application.

Key words*: superabsorbent, biopolymer, biodegradability, hydrogel, water storage.*

IMPACT OF OLIVE GROVE AGROECOLOGICAL PRACTICES ON CLIMATE CHANGE MITIGATION-RELATED INDICATORS

Oumaima HRAMECHE[1, 2], Georgios KOUBOURIS[2], Gkisakis VASILEIOS[2]

[1]Mediterranean Agronomic Institute of Chania, CIHEAM, Agrokipio, GR-73100 Chania, Greece
[2]ELGO-DIMITRA, Institute of Olive Tree, Subtropical Crops and Viticulture, Leoforos Karamanli 167, GR-73100 Chania, Greece

Corresponding author email: hrameche.oumaima@gmail.com

Abstract

In order to address the negative effects of climate change on olive groves, such as soil degradation, loss of soil fertility, and water scarcity, sustainable management strategies and practices must be implemented. The two-year effects of five different sustainable management systems, each utilizing different carbon inputs such as compost, pruning residues, insect manure, and cover crops, were studied in an olive orchard. The study, conducted under the PRIMA and Horizon2020 Framework programs for the Project Sustainolive, compared these sustainable systems to a conventional system with soil tillage. The results showed significant increases in water content, soil organic matter, and electrical conductivity in the sustainable systems compared to the conventional system. Additionally, the sustainable systems had higher levels of potassium and calcium in the soil and greater diversity and richness of weed flora. These agro-ecological management practices have the potential to increase agro-ecosystem services, decrease dependency on synthetic fertilizers, and optimize irrigation water in a long-term Mediterranean context, promoting a circular economy.

Key words*: olive grove, climate change, agro-ecological practices, carbon inputs, agro-ecosystem services.*

RESULTS REGARDING THE 24-HOUR COMPOSTS (OKLIN) COMPOSITION AND THEIR USE AS FERTILISER

Adrian PETICILĂ, Roxana Maria MADJAR, Florin STĂNICĂ, Adrian ASĂNICĂ, Raluca CIUBOTĂRAŞU, Ana Cornelia BUTCARU

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

Corresponding author email: anabutcaru@gmail.com

Abstract

The paper aims to present some of the results of the project "Research on the use of composts obtained from food waste", where more compost variants obtained with OKLIN series composters were analyzed and tested on two horticultural species (germination and total growth). OKLIN composters are designed to produce compost 24 hours after the organic residues are introduced, according the specifications. Compost obtained from different sources (grounds of coffee, vegetables (40%) and fruits (60%), vegetables (40%), fruit (50%), and fish (10%), food and vegetable waste (100%), etc) were analyzed regarding microbiota (bacteria, fungi, and respiration coefficient) and agrochemical parameters. Several ratio variants were tested on parsley (Petroselinum crispum) and Luffa monitoring germination rate and total growth. All the compost variants, in general, presented beneficial and neutral bacteria and fungi, with high potential as fertilizer. 10% and sometimes 20% were the most favorable ratio of compost as fertilizer for the horticultural plants tested.

Key words*: bacteria, composter, fungi.*

THE SPREAD OF THE MARBLE BUG IN EUROPE - REVIEW

Mihaela POSTOLICI URSACHI, Andreea UDREA BRASLĂ, Maria Marinela BÎNCĂ

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

Corresponding author email: mpostolici@gmail.com

Abstract

The marmorated bed bug, Halyomorpha halys Stal, is an invasive, polyphagous pest distributed on every continent in the Northern Hemisphere, with over 300 reported hosts. The spread in Europe was silent until 2013 and intensified after 2014, being present in at least 15 EU countries. The appearance of H. halys in Romania probably started around 2014, but its presence in the territory is difficult to determine, because there is a lack of communication between the various Institutions and the knowledge of citizens regarding this pest. Biological invasion is a major threat to biodiversity and ecosystem functioning, resulting in high economic losses. In 2017, the pest was detected in 23 of the 41 counties, with serious invasions reported by citizens in the Buzau, Bucharest and Ilfov areas.

Key words*: Halyomorpha halys, tackling, spread, attack.*

NATURA 2000 HABITATS FROM OLTENIA AFFECTED BY INVASIVE AND POTENTIALLY INVASIVE SPECIES (I)

Daniel RĂDUȚOIU[1], Laurențiu BĂLONIU[2], Ion STAN[1]

[1]University of Craiova, 13 Alexandru Ioan Cuza Street, Craiova, Romania
[2]Bayer S.R.L., Craiova, Romania

Corresponding author email: radutoiu02daniel@gmail.com

Abstract

The present paper analyzes some forest habitats from Oltenia, which are affected by different invasive and potentially invasive species. The large number of habitats present on the territory of Oltenia did not allow their unitary research. In this paper, references are made only to the habitats 91M0, 91E0, 91Y0, and 92A0. The main factor that greatly contributed to the introduction and rapid spread of these invasive and potentially invasive plants in the analyzed habitats was zoo-anthropogenic. The changes that occurred affected both the structure and the functions of these habitats. Among the invasive and potentially invasive species identified in the studied habitats, which affect their floristic composition, we mention: Ambrosia artemisiifolia L., Acer negundo L., Artemisia annua L., Asclepias syriaca L., Bidens frondosus L., Echinocystis lobata (Michx) Tor. et A. Gray, Prunus cerasifera Ehrh., Robinia pseudoacacia L., and Xanthium orientale L. subsp. italicum (Moretti) Greuter.*

Key words*: habitat, invasive, Natura 2000, Oltenia, Romania.*

POLYCARPON TETRAPHYLLUM IN ROMANIAN FLORA

Daniel RĂDUȚOIU[1], Culiță SÎRBU[2], Adrian OPREA[3]

[1]University of Craiova, 13 Alexandru Ioan Cuza Street, Craiova, Romania
[2]University of Life Sciences "Ion Ionescu de la Brad" Iași,
Mihail Sadoveanu Alley, No. 3, Iași, Romania
[3]"Anastasie Fătu" Botanical Garden, University "Alexandru Ioan Cuza",
7-9 Dumbrava Roșie Street, Iași, Romania

Corresponding author email: radutoiu02daniel@gmail.com

Abstract

This paper brings additional information about the red listed species Polycarpon tetraphyllum from the spontaneous flora of Romania. The research on this taxon started after the identification of a plant material collected from ruderal places of the municipality of Craiova (*Dolj County*). *Polycarpon tetraphyllum is the only species belonging to the genus Polycarpon* (*Family Caryophyllaceae*) *that is spread on the Romanian territory. At European level, two species are known* (*P. polycarpoides, P. tetraphyllum with three subspecies: P. tetraphyllum sp. tetraphyllum; ssp. diphyllum; ssp. alsinifolium*). *In some European countries, including Romania, this plant is considered to be adventive. The plant analyzed by us in this paper is an Atlantic - Mediterranean taxon, located at the northern limit of the range, found in southern and eastern Europe. In Romania, it is known only from Mehedinți County (i.e. from the localities of Orșova and Vârciorova) and from Dolj County* (*Valea Stanciului and Craiova*). *Our research on this species focused on information related to chorology* (*literature, herbarium and field data*), *habitat and the phytosociological context in which it was mentioned in the literature and in which it was found in the last two years.*

Key words*: chorology, critically endangered, spontaneous flora, Romania.*

THE QUANTITATIVE ESTIMATION OF SOME BIOCHEMICAL COMPOUNDS WITH ANTIOXIDANT PROPERTIES IN THE FRUITS OF THREE CULTIVARS OF *ELAEAGNUS UMBELLATA* THUNB. INTRODUCED IN THE REPUBLIC OF MOLDOVA

Ion ROŞCA, Elisaveta ONICA, Aliona GLIJIN, Alina CUTCOVSCHI-MUŞTUC, Vitalie MÎŢU

National Botanical Garden (Institute), Pădurii Street, Chişinău, Republic of Moldova

Corresponding author email: amustuc@gmail.com

Abstract

The article includes the results of the phytochemical evaluation of three taxa of Elaeagnus umbellata Thunb. (`Amoroso`, `Fortunella` and `Sweet 'n' Sour`). The analys is of ascorbic acid in the fruits of the three researched cultivars of E. umbellata revealed values between 85.97 and 99.69 mg / 100 g in frozen fruits and 127.62 - 135.34 mg / 100 g in dried fruits. Irrespective of the type of fruit preservation, the maximum amount of vitamin C was detected in the cultivar `Amoroso`, and the minimum – in the cultivar `Sweet 'n' Sour`. The minimum amount of tannins was found to be characteristic of the cultivar `Sweet 'n' Sour` in both frozen (1.25%) and dried (1.88%) fruits. The cultivars `Amoroso` and `Fortunella` recorded the same amount (1.66%) of tannins in the frozen fruits, however, in the dried fruits, the maximum value was achieved by the cultivar `Fortunella` (2.49%), and the cultivar `Amoroso` contained by about 16.6% less tannins.

Key words*: Elaeagnus umbellata, `Amoroso`, `Fortunella`, `Sweet 'n' Sour`, autumn olive, biochemical parameters, ascorbic acid, tannins, phenolic compounds.*

MAERUA ANGOLENSIS LEAF EXTRACT EFFECTS ON POPULATION DENSITIES ON *MELOIDOGYNE INCOGNITA* AND YIELD OF *CORCHORUS OLITORIUS* UNDER MICROPLOT CONDITIONS

Mmagadima SEBATI, Thobile MKHWANAZI, Zakheleni DUBE, Moses TIMANA, Rivoningo UBISI, Nicholus MNYAMBO

University of Mpumalanga, D725 and R40, Riverside,
Mbombela 1200, Nelspruit, South Africa

Corresponding author email: mmagadima.sebati@ump.ac.za

Abstract

Maerua angolensis is a medicinal plant that has been researched and reported to have phytonematicidal properties in a wide range of crops. Its potential use in traditional vegetables has not been investigated, hence the aims of the study is determining the effects of M. angolensis on population densities of southern root-knot (Meloidogyne incognita) nematode and yield of two Corchorus olitorius varieties, cv. 'Mangunzi 2' and 'Mangunzi 3'. Six treatments namely, 2, 5, 10 15 and 20 g of M. angolensis, commercial nematicide, Nemacur 10GR at a rate of 5 g per plant, and untreated control were laid out in a Randomised Complete Block Design with 5 replications. Maerua angolensis decreased the total nematode population densities in roots and soil for both C. olitorius cultivars. In conclusion, M. angolensis reduced nematode population, with no effect on the yield of C. olitorius on both tested cultivars.

Key words*: Corchorus olitorius, Maerua angolensis, Meloidogyne incognita, Phytonematicidal.*

INDIGENOUS AFRICAN VEGETABLE (*CORCHORUS OLITORIUS* L.) SCREENING AGAINST MELOIDOGYNE INCOGNITA

Mmagadima SEBATI, Thobile MKHWANAZI, Zakheleni DUBE, Moses TIMANA, Rivoningo UBISI, Nicholus MNYAMBO

University of Mpumalanga, D725 and R40, Riverside, Mbombela 1200, Nelspruit, South Africa

Corresponding author email: mmagadima.sebati@ump.ac.za

Abstract

Corchorus olitorius production is hindered by many factors with pests such root-knot nematodes being major. The challenge is exacerbated by inadequate information on the resistant status of available varieties of this nutritious indigenous vegetable. The objective of the study therefore was to assess the host-status and host-sensitivity of C. olitorius to southern root-knot (Meloidogyne incognita) nematode. Two C. olitorius cv. 'Mangunzi 2' and 'Mangunzi 3' were exposure to 0, 25,50, 100, 200, 400, 800,1600 and 3200 M. incognita, second stage juveniles (J2) and eggs for a period of 56 days. With experimental treatments arranged in a RCBD with 5 replications. Both C. olitorius varieties had reproductive factor (RF) greater than 1, with no plant growth variable reductions, except for dry root mass of Manguzi 2. In conclusion, based on Sasser et al., 1984 screening model, the two C. olitorius varieties were tolerant to M. incognita.

Key words*: Corchorus olitorius, Host-status, Host-sensitivity, Meloidogyne incognita.*

EVALUATION OF THE CONTROL OF CUCUMBER POWDERY MILDEW USING DIFFERENT TYPES OF COMPOST TEA

Samin SEDDIGH[1], Mojdeh MALEKI[2], Zohreh MALEKNIA[2]

[1]Department of Plant Protection, College of Agriculture, Varamin-Pishva Branch, Islamic Azad University, Daneshgah St., Razi Sq., Varamin, Iran
[2]Department of Plant Pathology, College of Agriculture, Varamin-Pishva Branch, Is, Daneshgah St., Razi Sq., Varamin, Iran

Corresponding author email: samin.seddigh@gmail.com

Abstract

Powdery mildew, Sphaerotheca fuliginea, is a major production problem in cucurbit crops in all parts of the world. The increasing public outcry against pesticides has generated an interest in the use of compost extracts (compost tea) to prevent and control diseases. In current research, the field experiment was performed in a commercial cucumber greenhouse in Pishva, Iran. Plants were grown under greenhouse conditions (L:D 14:10, 27±2°C Temp., and 60±10% RH). Taguchi`s design of experiments method was used to plan a minimum number of experiments and optimization to control cucumber powdery mildew. Three factors, which influence the control, were chosen. These factors were types of compost tea (aerated and non-aerated compost tea, aerated and non-aerated vermi compost tea), dosage (1:8 and 1:16 compost: water) and replication spray (once and twice/ week). Orthogonal array L8 was used with three replications. Based on the experiment the optimum conditions for controlling cucumber powdery mildew described as aerated compost tea with 1:16 dose, once per week. This research is warranted to determine suitability of aerated compost tea for inclusion in cucumber powdery mildew control programs.

Key words*: Compost tea, Cucumber, Greenhouse, Powdery mildew, Taguchi.*

BY-PRODUCTS FROM THE ESSENTIAL OIL INDUSTRY – VALORIZATION AND RECYCLING. PRACTICAL APPLICATION - ADSORPTION OF TEXTILE INDUSTRY DYES

Anton SLAVOV, Mariyana TOPUZOVA, Gergana MAROVSKA

Department of Organic Chemistry and Inorganic Chemistry,
Technological Faculty, University of Food Technologies,
26 Maritsa Blvd., Plovdiv 4002, Bulgaria

Corresponding author email: antons@uni-plovdiv.net

Abstract

The purpose of this study is to enrich the approaches and methods for valorization and utilization of the essential oil industry by-products and to outline the perspectives in this area. As a possible practical application lavender and rose by-products were used as a bioadsorbents for removal of textile industry dyes. The influence of contact time, adsorbent amount and temperature was investigated. The efficiency of adsorption with lavender and rose by-products was compared with activated carbon, Al_2O_3 and silica gel. The results suggested that lavender and rose solid by-products could be successfully utilized as biosorbents for purification of textile industry waste waters.

Key words*: adsorption, by-products, lavender, rose, textile dyes.*

EFECTS OF SOME DRYING METHODS ON THE CONTENT IN BIOACTIVE COMPOUNDS IN SEA BUCKTHORN BY-PRODUCTS

Ioana Loredana STANCIU, Mihaela GEICU-CRISTEA, Elisabeta Elena POPA, Paul Alexandru POPESCU, Mihaela Cristina DRĂGHICI, Amalia Carmen MITELUȚ, Mona Elena POPA

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

Corresponding author email: mihaela_geicu@yahoo.com

Abstract

Recent research has shown that the consumption of sea buckthorn (Hippophae rhamnoides) berries has many benefits for human health. Large amount of waste which result from sea buckthorn berries processing, yet containing significant quantities of bioactive substances, is being the subject of numerous latest research studies. Sea buckthorn by-products represent a valuable source of bioactive compounds that could be used for their favorable nutritional and functional properties in the pharmaceutical, cosmetic and food industries.
The aim of this work is to establish a method for drying process of ***sea buckthorn by-products*** *in order to obtain a powder from dry sea buckthorn waste with minimum loss of the bioactive substances. For this purpose, sea buckthorn by-product (peel and seeds) was dried at different temperatures (30˚C, 40˚C, 50˚C and 60˚C) by conventional hot air drying versus lyophilization method and then the antioxidant activity (DPPH), the content of total polyphenols and ascorbic acid content were determined.*

Key words: *bioactive compounds, by-products, conventional drying, lyophilization, sea buckthorn.*

TESTED SEED PRIMING METHODS TO STIMULATE THE GERMINATION OF *CITRUS LIMON* L.

Valentina STOIAN[1], Diana RIȘCOU[1], Ștefania GÂDEA[1], Anamaria Vâtcă[2], Mădălina TRUȘCĂ[1], Sorin VÂTCĂ[1]

[1]University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Faculty of Agriculture, Plant Physiology Department, Cluj-Napoca, Romania
[2]University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Faculty of Animal Science and Biotechnologies, Department of Management and Economics, Cluj-Napoca, Romania

Corresponding author email: sorin.vatca@usamvcluj.ro

Abstract

The germination of exotic plants usually encounters difficulties. The research aim was to assess the effect of different seed priming methods on lemon germination. A number of 42 test tubes were filled with 11 cm of cotton wool and 1 cm of sterilized quartz sand. Each test tube contained one lemon seed. Three seed priming methods were tested respectively hardening with hot water, osmo-hardening with polyethylene glycol and hot water, hydro-priming, and a control treatment without priming methods. The assessments were made according to the BBCH scale of growth and development. The seeds from osmo-hardening treatments needed 42 days to reach stage 10 on BBCH scale, and the control needed two extra weeks. The hardening hot treatment and hydropriming seeds need 56 days to reach BBCH 09 secondary stage. A percent of 100% germination capacity was obtained to seeds from osmo-hardening, hydropriming and control treatments after 56 days. The most successful treatment in terms of secondary stages distribution was represented by the osmo-hardening, followed by hardening, then control, and the lowest result was in the hydro-priming treatment.

Key words*: breaking dormancy; hardening; hydro-priming; osmo-hardening; seeds.*

CONTRIBUTIONS TO THE KNOWLEDGE OF THE COLEOPTEROFAUNA FROM ALFALFA CROPS

Nela TĂLMACIU[1], Mihai TĂLMACIU[1], Monica HEREA[1], Liliana MANOLE[2]

[1]"Ion Ionescu de la Brad" Iași University of Life Sciences,
3 Mihail Sadoveanu Alley, Iaşi, Romania
[2]Daj-Braşov, Romania

Corresponding author email: monica28is@yahoo.com

Abstract

The research was installed (mounted) in the alfalfa crops on May 15, in the year 2022. The soil traps type Barber were used in which a NaCl solution was placed, 25% concentration. The alfalfa crop where the observations were made is in the 5th year since establishment and a number of 12 soil traps were used. The material from the traps was collected periodically from May to September at intervals of 14-16 days on the following dates: 30.05, 15.06, 30.06, 15.07, 29.07, 14.08, 29.08, 13.09, 27.09. The material collected was transported to the Entomology Laboratory of USV Iasi. The collected insects were preserved in sanitary alcohol in a 20% concentration. The determination of the material was made later, using older and current determiners with the help of the Internet. The insect species collected belong to several families, among which we mention: the Carabidae, Chrysomelidae, Curculuionidae, Scarabeidae, Staphiliniidae, etc. families. Among the species collected we mention: Harpalus distinguendus Duft., Amara eurynota Panz., Pterostichus marginalis, Opatrum sabulosum L., Pterostichus cupreus, Necrophorus vespillo, Dermestes laniarius, Epicometis hirta, etc.

Key words*: traps, alfalfa, Carabidae, families, species.*

CONTRIBUTIONS TO THE KNOWLEDGE OF THE STRUCTURE, DYNAMICS AND ABUNDANCE OF HARMFUL AND USEFUL INSECT SPECIES FROM ALFALFA CROP

Nela TĂLMACIU[1], Mihai TĂLMACIU[1], Monica HEREA[1], Liliana MANOLE[2]

[1]"Ion Ionescu de la Brad" Iași University of Life Sciences,
3 Mihail Sadoveanu Alley, Iaşi, Romania
[2]Daj-Braşov, Romania

Corresponding author email: monica28is@yahoo.com

Abstract

The research was installed (mounted) in the alfalfa crops in the year 2022 on May 15. Barber-type soil traps were used in which a 25% NaCl solution was placed. The alfalfa crop where the observations were made is in the 5th year since establishment and a number of 12 soil traps were used. The material from the traps was collected periodically from May to September at intervals of 14-16 days on the following dates: 30.05, 15.06, 30.06, 15.07, 29.07, 14.08, 29.08, 13.09, 27.09. From the field, the samples were labeled, specifying the collection date and the trap number on the labels. The collected insects were preserved in sanitary alcohol in a 20% concentration. The determination of the material was made later, using older and current determiners with the help of the Internet. The species collected belong to several orders of insects, such as: Coleoptera, Diptera, Hymenoptera, Orthoptera, Thysanoptera and Homoptera. Among the species of coleoptera, carabids, chrysomelids and curculionids were more common. Bees, wasps and ants were collected from the Hymenoptera order.

Key words*: Barber, alfalfa, Coleoptera, chrysomelids, harvesting.*

DETERMINATION OF THE APPROPRIATE IRRIGATION PROGRAM FOR WATERMELON GROWN BY DRIP IRRIGATION METHOD IN ARID CONDITIONS

Ali Fuat TARI

Harran University, Haliliye, Turkey

Corresponding author email: aftari@hotmail.com

Abstract

This study was carried out to investigate effect of different irrigation interval and irrigation levels on yield and quality parameters of watermelon. The study was carried out in randomized blocks in a split plot design with 3 replications. Two different irrigation day intervals and four different irrigation levels depending on open water surface evaporation were used in this study. In the study, water was applied to D1 subjects 15 times during the growing season, xx of which were themed, and D2 individuals 7 times. The results of the experiment showed that irrigation levels, irrigation intervals, and their interactions all significantly affected watermelon yield. The highest yield was obtained from D1-I4 with 7380 kg da-1. This subject as obtained in 760.62 mm of irrigation water, and 716 mm of evapotranspiration. While the amount of irrigation water applied has a significant impact on all watermelon quality criteria, the irrigation day interval has a significant impact on all other quality criteria (0.05 P). The amount of irrigation water used and the seasonal production and water consumption are found to be correlated linearly.

Key words*: watermelon, arid , drip irrigation, water consumption, yield, quality.*

RESULTS REGARDING BEHAVIOR OF POTATO CULTIVAR IN MINITUBERIZATION PROCESS DURING 2021-2022

Andreea TICAN, Mihaela CIOLOCA, Monica POPA

National Institute of Research and Development for Potato and Sugar Beet Braşov, Fundăturii Street, no. 2, Braşov. Romania

Corresponding author email: tican_andreea@yahoo.com

Abstract

In order to investigate the effect of variety, nutrion space on minitubers production, a study was carried out in the Laboratory of Vegetable Tissue Cultures of NIRDPSB Braşov, in period 2021-2022. The trifactorial experience (3x2x2), on 3 repetitions, included the following factors: experimental factor A: cultivar, with three gradations: a1 – Marvis; a2 - Castrum; a3 – Ervant (considered control); experimental factor B: year of study, with two graduations: b1 – 2021 (considered control); b2-2022; the experimental factor C: the volume of the nutrition space, with two graduations: c1-1.5 l (considered control); c2-2 l. In this study Ervant cultivar stands out with a high number of minitubers (7.81), and the Castrum variety obtained the highest value of minitubers weight (75.65 g). The use of increased space for culture has a positive influence on minituberization, both in the number and weight of minitubers obtained/plant.

Key words*: cultivar; minitubers; nutrition space; plantlets; potato.*

HOST-STATUS AND HOST-SENSITIVITY OF LOCAL *M. ESCULENTA* VARIETIES TO *M. INCOGNITA* UNDER GREENHOUSE CONDITIONS

Moses TIMANA, Nicholus MNYAMBO, Zakheleni DUBE, Mmagadima SEBATI, Rivoningo UBISI, Thobile Perseverance MKHWANAZI

University of Mpumalanga, private bag x11283, Mbombela, South Africa

Corresponding author email: mosestimana97@gmail.com

Abstract

Cassava is a widely produced by communal farmers with great potential to alleviate the scourge of poverty. Resistant cultivars do not usually require specialised equipment and trained individuals in the application, this is critically important for communal farmers where the cassava crop is produced by old women who are semi-literate (Tanimola et al., 2016). The aim of the study was to determine the host-status and susceptibility of two most produced cassava cultivars, 'Mbonisweni' and 'Mganduzweni' to Meloidogyne incognita. The experiment was conducted under greenhouse conditions and laid out in a randomised complete block design with five replicates. Reproductive factor and potential of cv. 'mbonisweni' and 'Mganduzweni' were greater than one, with a carrying capacity of 50 nematodes per root system. Both cultivars are hosts and tolerant to the presence of M. incognita.

Key words*: cassava, host-sensitivity, host-status, Meloidogyne incognita, tolerance.*

THE INFLUENCE OF HORTICULTURAL PRODUCTS AND BYPRODUCTS ADDITION ON THE TEXTURAL AND NUTRITIONAL QUALITY OF BREAD AND BAKERY - A SYSTEMATIC REVIEW

Georgiana-Roxana TOMOŞOIU, Adrian ASĂNICĂ, Stelica CRISTEA, Dana TĂPĂLOAGĂ, Liliana TUDOREANU

University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Boulevard, Bucharest, Romania

Corresponding author email: roxana.tomosoiu@gmail.com

Abstract

Background. Bakery and breads may be customized to meet dietary and treatments requirements. The objective of this paper is to review the influence of fruits and legumes additives on textural properties, minerals concentrations, phenolic content, antioxidant activity of bread, bakery products and dough.
Methods. This work was developed following the PRISMA guideline for systematic reviews. A total of 335 articles were selected from 12 databases.
Results and Discussions. The elasticity index of bread decreased due to plant additives. Addition of 4% banana peel flour increased wheat bread polyphenol content from 11.365 mg GAE/g to 11.81 mg GAE/g. Bread total Fe concentration increased from 29.37 mg/kg (control) to 56.17 mg/kg due to ginger powder.
Conclusions. Consumers appreciate flavor, color and taste of bread and bakeries containing plant additives. Little information was found on fruits lyophilised powders as additives. Limited or no information about minerals concentrations, sensory analysis and consumer acceptability were found for most researches reporting textural parameters and polyphenolic content. An international protocol and guideline for reporting quality parameters for novel breads and bakery is needed.

Key words*: bread, plant additives, textural properties, phenolic content, minerals.*

ALIEN ECONOMICALLY IMPORTANT INSECT CROP PESTS IN BULGARIA - KNOWLEDGE GAP ANALYSIS

Rumen TOMOV, Boryana PLASHKOVA

University of Forestry, 10 Kliment Ohridski Blvd, Sofia, Bulgaria

Corresponding author email: rtomov@yahoo.com

Abstract

Forty-five alien insect species are widely distributed and established outdoors in Bulgaria. During the last ten years, ten of them have been considered economically important crop pests despite the fact that except Tuta absoluta, all the rest have been introduced in Bulgaria more than 50 years ago. The paper aimed to present the level of study of alien crop pests in terms of their distribution, biology, host plant range, applied control methods, and native and exotic natural enemies in Bulgaria. Published data concerning Leptinotarsa decemlineata, Trialeurodes vaporariorum, Myzus persicae, Diaspidiotus perniciosus, Pseudaulacaspis pentagona, Hyphantria cunea, Phthorimaea operculella, Helicoverpa armigera, Grapholita molesta, and Tuta absoluta are reviewed. The knowledge gaps detected are related to knowledge about the impact of alien pests on native flora, the non-target effect of exotic introduced exotic biological control agents, and the recruitment of native natural enemies. To facilitate the development of environmentally friendly pest management in the context of the European Green Deal studies on these topics are required.

Key words*: environmental impact, non-target effect, food web, biological control, Bulgaria.*

BIOCONTROL OF CROP PEST BY ALIEN BIOLOGICAL CONTROL AGENTS IN BULGARIA AND ROMANIA - STATE OF ART

Rumen TOMOV[1], Roxana CICEOI[2]

[1]University of Forestry, 10 Kliment Ohridski Blvd, Sofia, Bulgaria
[2]Research Center for Studies of Food Quality and Agricultural Products, USAMV of Bucharest, 59 Mărăști Blvd, District 1, Bucharest, Romania

Corresponding author email: rtomov@yahoo.co

Abstract

It is widely accepted that biological control agents (BCAs) play an important role in the sustainable suppression of crop pest population density. Alien BCAs are introduced in Bulgaria and Romania as classical biological agents and some of them are successfully established. In addition, a wide range of BCAs are permitted for use for augmentative biological pest control, including species not listed in PM 6/3 (5) Biological control agents safely used in the EPPO region. Based on published data review, the paper presents the level of knowledge about alien BCAs in terms of their establishment, distribution, host range, and use in pest management practice in Bulgaria and Romania. Actions and studies needed to facilitate the use of BCAs are discussed in the context of the European Green Deal, in order to facilitate the realization of the Farm to Fork and Biodiversity directive targets.

Key words*: exotic biological control agents, establishment, food web.*

CLIMATIC INPUTS INFLUENCE ON THE YIELDS OF WILD BERRIES HARVESTED FROM TRANSYLVANIAN TESTING SPONTANEOUS FLORA. A CASE STUDY: *RUBUS IDAEUS* L., AND *RIBES NIGRUM* L. IN THE SEASON OF 2022

Daniela TRIPON (BURDUHOS), Antonia ODAGIU, Ioan OROIAN, Claudia BALINT, Vladia ARNĂUTU

University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, 3-5 Calea Mănăștur Street, Cluj-Napoca, Romania

Corresponding author email: antonia.odagiu@usamvcluj.ro

Abstract

Even though the influence of the climatic traits on wild berries production and quality is well known, this issue is of interest to be analysed in connection with specific species, areas, and climate. The present study was conducted for characterizing the crude chemical composition, pH, ascorbic acid, and total phenolics and of studied wild berries species, and quantifying the interrelationships among climatic conditions characterizing the fruits collecting area and their dry matter content. In this aim, there were taken into consideration two species of wild berries, Rubus idaeus L.(raspberry), and Ribes nigrum L. (blackcurrants), respectively, harvested from Colibița area, Bistrița-Năsăud County, in the autumn of 2022. The influences of the precipitations, temperature, atmospheric pressure, and wind velocity on studied wild berries dry matter content are quantified. The above-mentioned climatic parameters were collected from databases, and averages were calculated by wild berries vegetation period (March – September 2022). According to the multiregression analysis, and simple correlations calculation, only precipitations and temperature influence the wild berries dry matter content. The studied interrelationships show that increasing trends in temperature and rainfall regimen are moderate and positively correlated with both fresh and dry yields of raspberry, and blackcurrants.

Key words*: blackcurrant, multiregression analysis, parameter, raspberry, vegetation period.*

CHLOROPHYLL CONTENT AND STOMATA MORPHOMETRIC FEATURES OF *ANETHUM GRAVEOLENS* L. IN A CONTROLLED EXPERIMENT WITH DIFFERENT SALINE LEVELS

Mădălina TRUȘCĂ, Ștefania GÂDEA, Anamaria VÂTCĂ, Valentina STOIAN, Sorin VÂTCĂ

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

Corresponding author email: valentina.stoian@usamvcluj.ro

Abstract

The intensive use for different purposes of dill requires split and even short-term studies that are desirable in purpose to highlight the threatening thresholds of salinity doses during vegetation growth season. The aim of the study was to assess the dill growth according to BBCH scale, the leaves' chlorophyll content and stomata number, and morphological characteristics during growth and development under salinity stress. The experiment was set under controlled conditions at 20±°C T, and 40% H under full light in the growth chamber. Two different salinity levels of 50 Mm, 100 mM NaCl and a control were tested in 3 treatments for 5 plants in 6 repetitions. Dill germination rate registered the higher value at 50 mM NaCl compared to the control treatment. At the end of the 10 BBCH germination stage, the lowest NaCl dose determined 100% of germination capacity. The higher stomata density was in the treatment with 50 mM NaCl, with 46% more compared to the control. The chlorophyll content of dill decreased with the increasing salinity levels. Dill is not negatively influenced by the two salinity doses tested.

Key words*: BBCH scale, dill, germination, physiological parameters, SPAD units.*

CHARACTERISING SEED DORMANCY MECHANISM IN *CORCHORUS OLITORIUS* (JEW'S MALLOW) VARIETIES

Rivoningo UBISI, Thapelo SELEKANE, Thobile MKHWANAZI, Moses NTIMANE, Nicholus MNYAMBO, Mmagadima SEBATI, Zakheleni DUBE

University of Mpumalanga, Mbombela, 0130020021, Mbombela, South Africa

Corresponding author email: rivoningo.ubisi@ump.ac.za

Abstract

Corchorus olitorius is a highly nutritious vegetable used by communal farmers in Africa to alleviate hunger and malnutrition. Seed dormancy is a major challenge in indigenous vegetable production resulting in uneven germination and lower yields. Therefore, the objective of this study was to determine the mechanism of seed dormancy with the hope of improving germination of different Jew's mallow varieties. Four Jew's mallow seed varieties; 'Manguzi 1', '2', '3' and 'Eshowe' were exposed to different seed priming methods; chemical (H2SO), mechanical scarification, physical (hot-water, sodium chloride and cold-water soaking) and Trichoderma harzianum methods. More than one dominant mechanism of dormancy in Jew's mellow was observed and these differed with varieties. 'Manguzi 1' and 'Manguzi 2' had physical dormancy being the most dominant mechanism of dormancy caused by seed coat impermeability to water. Eshowe cultivar exhibited minimum germination in all treatments most probably due to morphological dormancy. 'Manguzi 1', '2' and '3' exhibits morpho-physiological, physiological, and combinational (physical and physiological) dormancy respectively. Scarification combination treatments with sandpaper and hot water worked for 'Manguzi 3'.

Key words*: Corchorus olitorius, cultivar, dormancy, germination, pre-sowing.*

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 named after O.N. Sokolovsky», Chaikovska str., 4, Kharkiv, Ukraine

Corresponding author email: zakharova_maryna@ukr.net

Abstract

Nutritional quality of food 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 micronutrients Zn, Cu and Co in different variants 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 almost unchanged in carrots and beets. Cu content increased in cabbage and beets, but almost unchanged in carrots. Co content increased in carrots, beets and cabbage. The use of microfertilizers has increased the yield of vegetables.

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

A REVIEW ON THE ROLE OF MICROBIAL COMMUNITIES IN MAINTAINING PLANT AND SOIL HEALTH

Maria-Mihaela ZUGRAVU, Aglaia POPA, Liliana BĂDULESCU, Florentina ISRAEL-ROMING

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

Corresponding author email: aglaia_popa@yahoo.com

Abstract

Nowadays, the concept of soil health is characterised by three fundamental parameters such as: physical, chemical and biological soil properties. These parameters are in a continuous interaction when are influenced by climatic changes, soil type and the usage of different management practices. The importance of the microbial communities in soil is represented by their ability to decompose the soil organic matter and to transform, mineralize and release essential nutrients important for plant development. In addition, they are important in the detoxification of environmental pollutants and maintenance of soil fertility. In soil, microorganisms are abundant and diverse and include some important taxonomic categories such as: bacteria, fungi, actinomycetes, algae and soil protozoa. This review is focused on the role of beneficial microorganisms in soil health, highlighting the recent advances in this topic.

Key words*: management practices, microorganisms, soil health, soil parameters.*

APPLICATION AND RESEARCH OF BREEDING ACCELERATOR

Wang SHEN

Institute of Urban Agriculture, Chinese Academy of Agricultural Sciences (IUA-CAAS), Chengdu, x, Chengdu, China

Corresponding author email: 522143032@qq.com

Abstract

The Urban Agriculture Research Institute of the Chinese Academy of Agricultural Sciences and the China National Rice Research Institute have cooperated to adopt the precise regulation technology of the whole growth period dynamic LED light environment and nutrient solution coupling in the plant factory environment. In 2021, the major breakthrough of 63 days of harvest of rice planting will be achieved successfully, and the rice growth cycle of more than 120 days in the traditional field environment will be shortened by half. The rapid breeding platform for plant factories is a bold attempt to solve breeding problems and food security through industrialization, innovating traditional breeding and substitution methods, and providing technical reserves for large-scale grain production in future plant factories.

Key words*: urban agriculture, LED light, plant factory.*

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