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

2024
Bucharest

University of Agronomic Sciences
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VITICULTURE AND OENOLOGY

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FRUIT GROWING

MORPHOLOGICAL TRAITS OF SOME *LONICERA* SP. VARIETIES AFTER FIRST YEARS GROW IN ROMANIA

Adrian ASĂNICĂ, Raluca CIUBOTĂRAȘU, Monica STURZEANU, Oana HERA

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Abstract

The blue honeysuckle (Lonicera caerulea L.) is a perennial fruit-bearing shrub that originated from distant Siberia and northeastern Asia. The objective of this study is to present the morphological traits of 16 varieties of Lonicera sp. from a young orchard established in macrotuneles and 3 varieties in an open field planted in 2023 at distances of 1 × 3 m using agrotextile mulch. The characteristics of each variety were analyzed in detail, including height, crown shape, leaf parameters, branch structure, as well as flowers and fruits distinctive traits. The research was conducted in the experimental field of the University of Agronomic Sciences and Veterinary Medicine of Bucharest and Research Institute for Fruit Growing - Pitești involving varieties of Lonicera caerulea and Lonicera kamtschatica planted in the spring - autumn of 2023.

Key words*: Lonicera caerulea, Lonicera kamtschatica, morphology, phenology, traits.*

NON-DESTRUCTIVE ASSESSMENT OF STRAWBERRY FRUIT QUALITY

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Abstract

Conventional methods for fruit analysis are often destructive, time-consuming, and labor-intensive. Rapidly and non-destructively detecting fruit quality is an important topic in fruit agriculture. The aim of the research is a non-destructive assessment of the quality of strawberry fruits of three varieties grown in a greenhouse. A total 90 number of fruits were collected, 30 of each variety. The diffuse reflectance spectral data of all fruits in the region 900 to 1700 nm were obtained using NIRQuest (Ocean Optics, Inc.). The soluble solids content (^{o}Brix), ascorbic acid, and texture parameters (rupture force, yield force, modulus of fresh elasticity, and deformation work) were measured on each fruit. PLS regression was used to create models for the determination of tested parameters. Good PLS equations were obtained for soluble solids content and ascorbic acid content. The parameter RPD = SD/SECV, which is used to evaluate the accuracy of the determination, has values of 3.06 for SCC and 4.57 for ascorbic acid content. The accuracy of defining textural parameters was excellent. For each of them, the correlation coefficient R_{cv} was 0.99 and the determination errors were small. No difference was observed in the accuracy of the determination of tested parameters depending on the strawberry varieties.

Key words*: strawberry, soluble solids content, ascorbic acids, texture, NIR spectroscopy, PLS Regression.*

THE IMPACT OF THE CULTIVATION SYSTEM ON THE YIELD AND QUALITY OF SWEET CHERRIES

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Abstract

The goal of this study, which was conducted between 2010 and 2022, was to evaluate the impact of the variety-rootstock association, the crown shape and the planting distance on the production and quality parameters of sweet cherries. Stationary experiments have been carried out using diverse sweet cherry varieties, such as Valerii Cikalov, Record, Ferrovia, Kordia, Regina, Stella, Skeena, Bigarreau Burlat, Lapins, grafted on Cerasus mahaleb L. and Gisela-6 rootstocks, in various combinations, and which have been planted at diverse planting distances. The trees grafted on the Cerasus mahaleb L., rootstock have shown rapid growth and an average fruit yield of 15.58-16.12 t/ha during the period of their full productivity. The harvest of the trees grafted on the Gisela 6 and MaxMa 14 rootstocks has been early and amounted to 12.50-14.58 t/ha. The varieties Bigarro Burlat, Ferrovia and Lapins, planted at a distance of 5x1.5 m, have given a yield of 17.98-20.07 t/ha, which is 12.2-24.9% higher than that of the trees which have been planted at a distance of 4 x 2.5 m.

Key words*: sweet cherry variety, cultivation system, rootstock, density, crown shape.*

STRUCTURE OF THE VEGETATIVE ASSEMBLY OF APPLE TREES ACCORDING TO AGE AND THE BIOLOGICAL CHARACTERISTICS OF THE VARIETY

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Abstract

This work refers to the study of the structure of the vegetative ensemble of apple trees organized in the experimental orchards of SRL "Elit Fruct" and SRL "Prodcar". The apple varieties Granny Smith, Gala Delicious, Gala Buckeye Simmons, Golden Delicious, Golden Delicious Reinders, Red Velox and Fuji Kiku, grafted on M9, intended for the establishment of high density plantations, cultivated in the conditions of the central area of the Republic of Moldova. The vegetative growth of the trees in the apple varieties taken in the study is expressed, quantitatively, by the volume of vegetative growth accumulated annually by the size of the height and width of the crown of the trees, by the size of the surface and volume of the crown, as well as the level of soil coverage of the whole vegetative growth of trees.

Key words*: apple variety, vegetative assembly, tree crown.*

WINFOLIA SYSTEM - INSTRUMENT FOR PEST AND DISEASE ATTACK EVALUATION IN PEACH AND NECTARINE ORCHARD

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Abstract

The peach orchard was planted in 2017 using 14 peach and 16 nectarines new cultivars, grafted on various rootstocks: Adesoto, Myrobalan 29C, Saint Julien A, and GF677 on two different planting systems: Trident and Vertical axis. The planting distances varied from 4.0 x 1.5 m for Vertical Axis (1,666 trees/ha - 1,666 axis/ha) to 4.0 x 2.0 m for Trident (1,250 trees/ha - 3,750 axis/ha). The research was conducted over 6 years, and in the last year, 2023, leaves were analysed in the growing season and at the end of it (late November). The leaves were harvested at 3 different heights (bottom, half, and top of the tree canopy). Only 10 leaves per cultivar were analysed and the incidence of the bacterial diseases Xanthomonas arboricola pv. pruni (XANTPR) and Pseudomonas syringae pv. persicae (PSDMPE) was measured using a scanner and the WinFolia Software. Significant differences of the bacterial disease incidence were registered at nectarine cultivars, according to the tree canopy Vertical axis, showing more sensitivity. Big Bang/GF677 was the most tolerant cultivars, while Big Fire/GF677, the most sensitive.

Key words*: WinFolia, Xanthomonas arboricola, Pseudomonas syringae, cultivars, sensitivity.*

PLANT BASED EDIBLE COATINGS FOR BUILDING THE SUSTAINABILITY OF THE FOOD CHAIN TOWARDS BIOECONOMY

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Abstract

In the context of increasing awareness regarding the impact of human activity on the environment and the need for sustainable solutions applicable in the food industry, this study investigates an innovative approach for the protection of fresh fruit after harvest. It is proposed to use edible coatings enriched with extracts obtained from plants, representing not only an effective barrier against damage, but also a step towards a more sustainable bioeconomy. Therefore, we explored recent perspectives on post-harvest protection of fresh fruits by coating with edible solutions enriched with plant based compunds. The studied edible coatings were formulated by incorporating plant extracts with already demonstrated antioxidant and antimicrobial properties. Given their edible nature, it is considered that coatings also have a positive impact on the environment because it is eliminated the waste associated with traditional packaging. In the bioeconomy perspective design and use of environmentally friendly edible coatings is supported by an eco-efficient approach to production, thus reducing the ecological footprint and bringing significant contributions to the sustainability of the fruits value chain.

Key words*: postharvest storage, fruits, edible coatings, food chain, bioeconomy.*

PHYTOCHEMICAL COMPOSITION CHANGES OF SWEET CHERRY FRUITS RELATED TO APPLICATION OF SOME TREATMENTS TO REDUCE SWEET CHERRY FRUIT CRACKING

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Abstract

Finding the best solutions for obtaining high and quality productions it is always an ongoing challenge in sweet cherry production. Fruit cracking has many reasons. The hard rainfall before harvest is one of the main problems in almost all cherry growing regions. Important losses of the production are expected with this situation, several caused by physiological disorders. Some of orchard management practices assume preharvest spray treatments like the foliar application of minerals or growth regulator. This experiment was carried out at Research Institute for Fruit Growing Pitești-Mărăcineni, in 2023 in order to study the effect of this treatments: Liposam (10 ml/10 l), SM6 (50 ml/10 l), Borocal (50 ml/10 l) and Gibb A3 (4 g/10 l) on sweet cherry fruit chemical composition. The biochemical analysed indicators were: total dry matter content, soluble solids, total fruit acidity, vitamin C, total sugar content, total polyphenol, total anthocyanin content and soluble solid/titratable acidity ratio. All of them showed differences between treatments.

Key words*: sweet cherry, fruit cracking, chemical composition, spray treatments.*

CORRELATION BETWEEN SWEET CHERRY QUALITY TRAITS AND FRUIT CRACKING INDEX AT THREE ROMANIAN VARIETIES

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Abstract

Cracking in sweet cherry is often mention as a serious problem in many commercial orchards. Research was conducted on reducing the phenomenon of cracking and keeping in mind that cheap, easily accessible, effective solutions for farmers in the specific climatic conditions of our country, is of particular importance. Fruit quality is the target of every farmer. In an attempt to obtain higher quality fruit, it is possible that sometimes, especially if significant rainfall occurs during the ripening period, producers neglect the cracking susceptibility of their varieties. In a two-year experience (2022-2023) we evaluated three Romanian sweet cherry varieties from the perspective of fruits quality parameters as follows: weight, firmness, pH, total soluble solids, total acidity, fruit maturity index, color, soluble cuticular wax content). `Special, `Tentant` and `Severin` varieties grafted on `IP-C8` rootstock have been quantitatively assessed by the cracking index. `Severin` recorded the largest fruits and `Special` registered the highest values of total soluble solids. These traits represent one of the most important quality attributes in relation with the intensity of sweet cherry fruit cracking.

Key words*: sweet cherry, cracking index, fruit quality, spray treatments.*

THE SPECIFICS OF ROOTING, GROWTH AND FRUITING OF SOME APPLE VARIETIES IN THE CONDITIONS OF THE SOUTH OF THE COUNTRY

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Abstract

In order to expand the varieties of fruit tree species, it is necessary to know some of their biological peculiarities, the growth dynamics of the roots of the rootstocks that influence the power of the tree`s growth, the fruiting of the trees. Also, the good compatibility between grafts and rootstocks is a basic characteristic for the correct choice of the two partners and the differentiated establishment of the most valuable rootstock for each individual variety. In the process of growth and fruiting, the stem is mainly influenced by the underground part, respectively by the root system. In conclusion, specifying the best rootstock with good rooting that determines a constant production, significant and with superior quality fruits, is essential.

Key words*: apple, root system, rootstocks.*

IMPROVING FRUIT QUALITY AND STORABILITY USING POSTHARVEST TREATMENTS WITH BENEFICIAL MICROBES AND NATURAL COMPOUNDS - AN OVERVIEW

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Abstract

Fresh fruits are very perishable and susceptibile to damage very quickly after harvest during storage with significant losses of quality characteristics and thus of the yield. Chemical fungicides were intensively used to reduce the incidence of post-harvest diseases, maintaining quality and extend shelf life, but they led to the development of resistance to various pathogens and the appearance of residues on the fruit surface, which represents a risk for consumers. To minimize storage losses, a varied range of postharvest treatments have been evaluated to reduce fungal disease and extend the storage period of the fruits while maintaining the quality. The present review provides a brief overview on the use of different postharvest treatments with natural compounds and/or beneficial microorganisms and summarises information about their effect on maintaining quality, antioxidant capacity and reduce fungal diseases during fruit storage.

Key words*: fungal disease, storage, Trichoderma, chitosan, salicylic acid, essential oils.*

THE EFFECT OF SOME FOLIAR FERTILIZERS ON FRUIT QUALITY OF PEACH

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Abstract

The utilization of foliar fertilizers has become a fundamental management tool in intensive and super-intensive orchards. For this experiment, five peach genotypes (DDD 67, Maria Bianca, Eureka, HB 19-9 and Tokinostate) were studied. Each genotype was treated with four different foliar fertilizers, two organic and two chemical, during three separate growth phenophases. The genotypes were divided into five groups from which one group functioned as the experimental control and received no foliar treatment. In the case of the analyzed genotypes, the fertilizers, especially the biological ones, had significant positive influences on the internal characteristics of the fruits. Regarding the soluble solid content, in all genotypes, except HB 19-9, better results were obtained in the case of biological fertilizers usage, especially the Cropmax fertilizer. The highest values of total polyphenol content, in all genotypes, except Eureka, were also obtained in the case of biological fertilizers usage.

Key words*: foliar fertilizers, peach; total polyphenol content, soluble solid content.*

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THE EFFECT OF THE CULTURE SUBSTRATE ON THE CONTENT OF BIOACTIVE COMPOUNDS IN SOME RASPBERRY GENOTYPES

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Abstract

Raspberries are shrubs that belong to the genus Rubus idaeus L., Rosaceae's family. The raspberry culture is one of the most widespread among fruit bushes. Raspberries include a large number of varieties with different ripening periods, with summer and autumn fruiting of the remontant ones. The fruits of the genus Rubus are among those rich in bioactive compounds (anthocyanins, dietary fiber, vitamins, minerals and carbohydrates), so beneficial for human and animal health (Vega et al., 2021) The objective of the paper was to evaluate the bioactive compounds with antioxidant properties from raspberry fruits obtained from plants grown on different culture substrates, such as: manure, garden soil, forest compost, semi-fermented compost and spent mushroom substrate (SMS), applied to the soil. The studied plantation was established in the spring of 2020, and the presented results refer to the fruits harvested in 2022. The experiments were set up in the field within SCDP Băneasa - the Moara Domnească Afumati experimental farm.

Key words*: raspberry cultivation, nutritive substrates, bioactive compounds.*

ASSESSMENT OF THE BIOCHEMICAL QUALITIES AND COLOUR PARAMETERS OF FRESH AND FROZEN FRUITS OF HIGHBUSH BLUEBERRIES GROWN IN BULGARIA

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Abstract

In recent decades, the attention of scientists has been focused on the fruits of Vaccinium L. due to their significant potential to be used in the food, pharmaceutical, and cosmetic industries. In the present experiment, the biochemical composition of fruits of four introduced highbush blueberry varieties (Bluecrop, Bluegold, Spartan, Toro) grown in a demonstration plantation of RIMSA-Troyan was analyzed. The changes in the biochemical composition of fresh and frozen fruits after 1-year of storage at - 18°C (in refrigerated conditions) were compared. The fresh fruits of Bluegold are distinguished by a higher content of total and inverted sugar, ascorbic acid, tannins, anthocyanins, and pectin than the other studied varieties. In Bluecrop fruits, after one year of storage under refrigerated conditions, higher content of dry matter weight, ascorbic acid, tannins, and pectin were reported. The best results in terms of colour brightness were reported for fruits of the Spartan variety (22.68).

Key words: *blueberry, chemical composition, colour parameters, storage, Vaccinium corymbosum L.*

THE IMPACT OF VARIOUS FERTILIZING SCHEMES ON THE BIOCHEMICAL COMPOSITION OF ARONIA FRUITS

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Abstract

The scientific experiment was conducted in a demonstration plantation at the Research Institute of Mountain Stockbreeding and Agriculture of Troyan. A fertilizing scheme was applied to Aronia shrubs with various types of fertilizers, as well as combinations among them. The biochemical composition of Aronia berries was compared after harvest and after one year of storage at -18°C. High values of dry weight, dry matter by Re, pectin, and total polyphenols were identified in the potassium sulfate fertilizing variant. The combined fertilizing with triple superphosphate, potassium sulfate, and carbamide gave the highest content of total sugars, sucrose and total polyphenols in fruits after the storage period. Statistical differences were proven among fertilizing variants in terms of dry matter by Re, total sugars, sucrose, and ascorbic acid. Organic acids, anthocyanins, and total polyphenols had proven results. The objective of the present study is to analyze the changes in the biochemical composition of Aronia berries after the application of various fertilizing variants, after harvest, and one-year storage period.

Key words: *Aronia berries, Aronia melanocarpa L., biochemical composition, fertilizing, storage.*

OBSERVATIONS ON ARTHROPODS EXISTING IN SOME ARONIA PLANTATIONS IN THE NE AREA OF ROMANIA

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Abstract

Black chokeberry (Aronia melanocarpa L.) is a fruit-bearing shrub that has come to the attention of growers due to the content of antioxidants and vitamins in the fruit. Being a perennial crop, it provides stable habitats for both useful and harmful entomofauna. The aim of the work was to evaluate the diversity of existing arthropods in an aronia plantation within the experimental plots of RSFG Iași. The experience was organized in four variants: V1 - in which approved treatments for ecological agriculture were applied; V2 - ecological treatments and irrigation, V3 - in which approved conventional treatments, V4 - conventional treatments and irrigation, each variant having three repetitions. Arthropod densities were sampled using Barber-type soil traps, in which the fixing solution was sodium chloride (NaCl) with a concentration of 25%. The harvestings were made periodically, from the beginning of May to the end of September 2022. The structure of the collected material varied according to the experimental variant. The arthropod fauna was made up of species that systematically fall into the following orders: Coleoptera, Hymenoptera, Heteroptera etc.

Key words*: arthropods, black chokeberry, treatments, useful entomofauna.*

EVALUATION OF BLUEBERRY FRUITS AND JUICE OF SOME CULTIVARS GROWN IN PITEȘTI - MĂRĂCINENI, ROMANIA

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Abstract

Highbush blueberry is a popular berry with an attractive flavour and colour. It provides health benefits due to an important number of bioactive compounds with antioxidant, antitumor, antimutagenic, and antidiabetic effects, as well as to its ability to prevent cardiovascular disease. Blueberry juice is one of the most widespread blueberry products and it is demanded by consumers since it is tasty and it preserves most of the nutrients. The aim of this study is the evaluation of the blueberry fruits and juice of some cultivars grown at the Research Institute for Fruit Growing Pitești - Mărăcineni, Romania. Since heat processing affects the nutritional and sensory properties, blueberry juices have been prepared by cold pressing the fruit. In order to inhibit the development of the fermentation microbiota and improve the organoleptic characteristics of blueberry juices, the samples of each juice were prepared in a 1:1 (w:w) mixture with acacia honey. Total tannin content (TTC) and total flavonoid content (TFC) were periodically determined for all juices. The results revealed very significant effects of the three factors (genotype, storage period and sweetener) on TTC and TFC, with acacia honey showing the lowest effect size.

Key words*: highbush blueberry, total tannins content (TTC), total flavonoids content (TFC).*

THE ORIGIN OF ROMANIAN BLUEBERRY CULTIVARS

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Abstract

Vaccinium corymbosum (L.) is a plant native to North America and belongs to the genus Vaccinium L., the Ericales order, family Ericaceae, Subfamily Vaccinioideae. Blueberries are classified under the family Ericaceae, subfamily Vacciniaceae, genus Vaccinium, and subgenus Cyanococcus. They are most commonly found growing in acidic and infertile soil conditions. Highbush blueberries have a higher total sugar content compared to other berries of the Vaccinium genus. The first blueberry crop in Romania was established in Bilcesti, Arges. Since 1980, blueberry breeding has been carried out at the Research Institute for Fruit Growing Pitești - Mărăcineni, Romania, using different origins and parent plants. Controlled hybridization is used in the breeding process, where the parents or genitors are chosen based on the desired blueberry breeding objectives. The aim of this study is to expand the knowledge base on the pedigree and biometrical traits of Romanian blueberry cultivars.

Key words*: the first blueberry crop, controlled hybridization, pedigree, dendrogram of Vaccinium corymbosum.*

EVALUATION OF SOME BLACKCURRANT CULTIVARS ACCORDING TO FRUIT QUALITY PARAMETERS

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Abstract

Ribes nigrum L. (blackcurrant) is widely cultivated across temperate Europe, Russia, New Zealand, parts of Asia, and to a lesser extent, North America. Blackcurrants are a valuable source of bioactive compounds like anthocyanins and polyphenols. The berries are used in the production of juices, nectars, jams and functional food. Cultivars with enhanced levels of anthocyanins are currently requested by juice processors and consumers due to their health benefits. The experiment has been carried out at the Research Institute for Fruit Growing Pitești - Mărăcineni, Romania, using six cultivars with different origins: 'Tiben', 'Ruben', 'Tisel', 'Gagatai', 'Titania', and 'Kalinka'. The following physical parameters were measured: yield, berry weight (BW), diameter, firmness, soluble solids content (SSC) and total sugar content (TSC). Also, a series of biochemical parameters were determined, such as: total polyphenols content (TPC), total flavonoids content (TFC), total tannins content (TTC), total anthocyanins content (TAC), and lycopene and β-carotene contents. All the determined parameters were correlated with the antioxidant activity values.

Key words*: blackcurrant, breeding, antioxidant activity, total polyphenol content (TPC), total flavonoid content (TFC), total anthocyanin content (TAC), lycopene content, β-carotene content.*

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

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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.*

FROM GENES TO COLORS: *MYB1* VARIABILITY IN ROMANIAN APPLE VARIETIES

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Abstract

One of the fruit quality traits taken into consideration by consumers is color, since it indicates fruit ripeness, taste, and provides information about potential health benefits. Apple fruits come in a variety of colors, from green to yellow, pink, red, purple, or combinations of these colors. The pigments responsible for these colors are chlorophyll, carotenoids, and anthocyanins. The red and purple colors are a result of anthocyanins accumulation in vacuole, due to both genetic and environmental factors. One of the genes responsible for regulating the expression of anthocyanin biosynthesis genes is MYB1, which encodes a nuclear protein that controls anthocyanins accumulation in apples. This study presents the genetic variability at the level of MYB1 gene in eight Romanian apple varieties: 'Crețesc', 'Generos', 'Domnesc', 'Romus 3', 'Valery', 'Remar', 'Rebra', and 'Rustic', identifying the Single Nucleotide Polymorphisms (SNPs) present in MYB1 gene. Understanding the relationship between gene sequence, which translates into protein structure, and fruit color is important for apple breeding programs, to develop novel varieties with specific fruit colors.

Key words*: Malus domestica Borkh., genetic variation, Malus breeding, transcription factor.*

ASSESSMENT OF TECHNOLOGICAL APPROACHES FOR THE PRODUCTION OF APPLE MAT M9 BASED ON MATHEMATICAL AND STATISTICAL ANALYSIS

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Abstract

The article presents real data from the production process of the apple pad m9, using several different technological approaches. The aim of the research is to evaluate the technologies through the use of a mathematical apparatus - dispersion and regression analysis. The obtained results are adequate and easy to interpret, comprehensively reflecting the process, but valid only under the specific conditions. However, it can be clearly delineated that the use of moisture-absorbing materials, as soil additives, has a positive effect on the quantity and quality of apple rootstock production. Using Single ANOVA and subsequent Dunkan's test is estimated the significance of chemical elements for multidirectional comparisons indicated that for five of the investigated seven elements.

Key words*: apple, regression, correlation, cluster analysis.*

COMERCIAL AND BIOCHEMICAL QUALITY OF ROMANIAN PEAR GENOTYPES

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Abstract

The present study was carried out to evaluate the quality of different pear genotypes used in the breeding programs at Genetic and Breeding Department of Research Institute for Fruit Growing Pitești, Romania. Thirteen new pear genotypes harvested at the commercial maturity stage: 'Argessis', 'Carpica', 'Cristal', 'Daciana', 'Haydeea', 'Isadora', 'Paradox', 'Paramis', 'Romcor', 'P20R41P30', 'SP06C2P', 'Triumph' and 'Tudor' were compared with internationnally recognized varieties: 'Monica' (Romanian cultivar), 'Xenia' and 'Williams'. In this study we analyzed the commercial parameters (weight, firmness, color) and the biochemical indicators (total dry mater content, soluble dry matter, titratable acidity, the soluble dry matter/ titratable acidity ratio, vitamin C, and polyphenols). The obtained data leads to the conclusion that 'Isadora' and 'SP06C2P5P' fruits have the biggest chance to fulfill consumer expectations, due to their commercial qualities, then the reference variety 'Williams' cultivar. Also, the 'Isadora' variety had the content of polyphenols and the total dry substance superior to the three control cultivars.

Key words*: breeding program, fruit quality, polyphenols, Pyrus communis (L).*

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

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Abstract

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

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

PERSPECTIVE VARIETIES AND FORMS OF *PRUNUS CERASIFERA* FROM THE TROYAN REGION, EXHIBITING RESILIENCE TO EXTREME CLIMATIC FACTORS

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Abstract

The representatives of Prunus cerasifera Ehrh are the most numerous and diverse in vegetative and reproductive indicators, and are highly valued by the local population in the sub-mountainous and mountainous regions. Despite their widespread presence, this species remains poorly studied. Expeditions were conducted during the period 2020-2023 in the region of the Central Balkans with the aim of studying selecting valuable plant genetic resources of thornlessplum with freestones fruits. A red-fruited genotype of the KarlovskaAfazka cultivartype, one red-leaved and two yellow large-fruited genotypes with valuable economic qualities, distinguished by high fertility and simultaneous fruit ripening, were selected. The years of this study are characterized by heavy rainfall in the spring and drought in the period of July - October. The genotype Y46Tr stands out with the highest weight (46.74 ± 0.35 g). Regarding the biochemical composition, the highest amount of dry matter was recorded in RKar – 17.05%, while the highest value of polyphenols was registered in RTrL (143.27 mg/g). The fruits of RTrL and Y46Tr are characterized by the most attractive external appearance.

Key words*: Prunus cerasifera, plum, genotypes, genetic resources, biochemical compounds, biometric.*

INFLUENCE OF SOIL AND CLIMATE CONDITIONS ON SOME QUALITATIVE INDICES IN SOME CULTIVARS OF *PRUNUS CERASUS*

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Abstract

The paper presents aspects related to the soil and climate conditions specific to Giarmata, Timiș County, Romania, and their influence on the main qualitative indices of five cultivars of sour cherry (Prunus cerasus): Mari timpurii, Târgu-Jiu 505, Oblacinska, Grecia 2, and Meteor. The research was carried out during 2021-2022 in a family-type plantation on a preluvosol soil type. The main indices studied were: tree vigour, fruit set degree, production, biometric elements, and fruit chemical composition. The results highlighted the following aspects: the diameter of the trunk was between 125.2-170.5 mm, the diameter of the crown was between 3.5-4.6 m per row and between 3.1-4.3 m between rows, the height of the trees was between 3.5-4.9 m, and the height of the crown was between 3.0-4.2 m. Fruit production ranged between 9.41 t/ha and 14.07 t/ha. Biometrics consisted of major diameter, minor diameter, tree height, tree size index and peduncle length. The chemical composition of the fruits was influenced by the soil and climate conditions, differing from one cultivar to another during the two study years.

Key words*: biometrics, cultivars, fruit chemical composition, Prunus cerasus, soil and climate conditions.*

AGROPRODUCTIVE EVALUATION OF SOME SWEET CHERRY CULTIVARS IN THE PEDOCLIMATIC CONDITIONS OF N-E ROMANIA

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Abstract

The sweet cherry (Prunus avium L.*) can be one of the most profitable fruit crops grown in temperate climates, highly appreciated worldwide due to the taste, color and nutritional value of the fruits. This study was carried out in the 2021-2023 years using some foreign ('Regina', 'New Star' and 'Kordia') and autochthonous cultivars ('Bucium' and 'Maria') from the Research Station for Fruit Growing (RSFG) Iasi. The aim of this research was to evaluate the productivity in the context of current climate change by determining the main physical and biochemical characteristics of the fruits (weight, diameter, color, sugar composition, titratable acidity and vitamin C), the total fruit production as well as the productivity index related to the trunk section area. The obtained results were interpreted statistically and although there was a variability between the experimental variants, the local cultivars present characteristics that allow agrobiodiversity and a better planning of future improvement programs.*

Key words*: fruit quality, growth, production, Prunus avium* L.

DAMAGE BY *DROSOPHILA SUZUKII* MATSUMURA FRUITS OF BLACKCURRANT CULTIVAR 'TITANIA'

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Abstract

Drosophila suzukii (Matsumura) is a particularly dangerous species of tree fruit and berry fruit species in Europe and all over the world. It was first reported in 2014 in the regions of Blagoevgrad, Kyustendil, and Plovdiv in Bulgaria. Its harmful activity directly threatens the yield and some years, it can compromise the harvest. The present study aims to monitor the population density and fruit damage to blackcurrant fruits of the Titania variety. The studies were conducted in the period 2019-2020 at the Research Institute of Mountain Stockbreeding and Agriculture of Troyan.Insect traps were used for monitoring, which were placed at the beginning of fruit ripening. As a result of the conducted observations, it was found that the spotted wing drosophila appeared at the beginning of fruit ripening, and its peak was reported during large-scale fruit ripening.

Key words: *Drosophila suzukii, damages, insect traps, blackcurrant.*

USE OF ECOLOGICAL METHODS TO CONTROL PATHOGENS AND PESTS IN APRICOT THE SOUTHERN AREA OF ROMANIA

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Abstract

The southeastern part of Romania is the area that offers the most favorable ecoclimatic conditions for apricot cultivation. The territory of the RSFG Constanta is influenced, from a climatic point of view, both by the Black Sea as well as the Danube, which means that spring arrives later summers are droughty and autumns are long and warm. The dynamics of the population of harmful microlepidoptera was realized with the help of AtraLIN, AtraMOL, AtraNUB pheromone traps. Trapping by specific sex pheromones initiated in 2020-2022 in an apricot plantation at the Research Station for Fruit Growing (RSFG), to monitor three pests, peach twig borer (Anarsia lineatella), oriental fruit moth (Cydia molesta) and (Hedyia nubiferana). The results of the three-year study showed that in 'Elmar' cultivar The amount of catches was higher for Anarsia lineatella (AtraLIN)in the Olimp cultivar, 341 butterflies in the year 2022 and the lowest amount of catches was for Hedyia nubiferana (AtraNUB), 267 butterflies in the year 2022.

Key words: *Prunus armeniaca, symptoms, variety sensitivity monitoring, feromonal traps, ecological products.*

MORPHO-BIOCHEMICAL RESPONSE OF BLUEBERRY CULTIVAR HORTBLUE PETITE UNDER DROUGHT STRESS INDUCED BY PEG 6000

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Abstract

The in vitro response of the blueberry cultivar Hortblue Petite to drought stress induced by PEG 6000 was investigated in this study. PEG was added to the culture media before pH adjustment at the following concentrations: 0 g/L, 10 g/L, 20 g/L, 30 g/L, 40 g/L, 50 g/L. The culture medium used was Woody Plant Medium (WPM) with 100 mg/l Sequestren 138, 1 mg/L zeatin (Z), and a pH of 5. After 80 days of in vitro culture, the average number of shoots, shoot length, fresh weight (FW), dry weight (DW), water content (WC), chlorophyll (Chl a, Chl b), carotenoids (Caro), proline (Pro), total soluble sugars (TSS), total phenolic compounds (TPC), total flavonoids (TFC), malondialdehyde (MDA), and hydrogen peroxide (H_2O_2) were evaluated. Drought stress induced by PEG increased the number of proliferated shoots but harmed shoot length. A reduction in the content of photosynthetic pigments was also observed. Osmolytes, oxidative stress markers, and antioxidant compounds also indicated the effect of drought stress on the Hortblue Petite blueberry cultivar.

Key words*: drought, hydrogen peroxide, malondialdehyde, proline, V. corymbosum.*

COMPARATIVE STUDY IN THE NURSERY OF VEGETATIVE PLUM ROOTSTOCKS, 'MIRODAD 1' AND 'SAINT JULIEN A'

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Abstract

In Romania, for plum species, the last registered vegetative rootstock was 'Mirodad 1'. The purpose of the research was to study the behavior of the 'Mirodad 1' vegetative rootstock compared to the 'Saint Julien A' rootstock at propagating by softwood cuttings, at planting and grafting in nursery conditions from the Southern part of Romania. In the nursery, the interaction of the two rootstocks with the plum varieties 'Tuleu gras', 'Jojo' and 'Romanța' was evaluated. The indicators monitored were the rooting percentage of softwood cuttings, viable rootstocks remaining after planting and growth indicators of grafted trees (height, cross-section area of the trunk, number and length of shoots). The results of the propagation showed that the 'Mirodad 1' rootstock has a significantly higher rooting percentage than the 'Saint Julien A' rootstock. After grafting, the 'Mirodad 1' rootstock induces the same vigor as the 'Saint Julien A' rootstock to the 'Tuleu gras' and 'Romanța' cultivars. In the case of the 'Jojo' cv., the 'Mirodad 1' rootstock induces greater vigor than the 'Saint Julien A' rootstock.

Key words*: grafted trees, plum, propagation, vegetative rootstocks, vigor.*

SENSORIAL ANALYSIS FOR SOME ROMANIAN AND FOREIGN BLUEBERRY VARIETIES

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Abstract

Blueberries are considered super-food because of their richness in antioxidants and vitamin C, essential for strengthening the immune system and protecting the brain. Breeders strive to improve the blueberries' fruit quality treats, so these fruits will have flavors and unique tastes, considerable size, and intense colors, which makes them even more appreciated by consumers. The firmness of fruits, their juiciness, taste, aroma, size, and color are all indicators used to appreciate the 30 blueberry varieties used in this study. Eight Romanian varieties and 22 foreign varieties were analyzed in a testing session in August 2023 with 51 accessors. The highest ranking is attributed to the 'Brigitta' variety. The 'Pink Lemonade' variety scored the best results for flavor, taste, firmness, and juiciness. The Romanian variety 'Delicia' was in the top 3 for 3 indicators. The results of the present study could be used by breeders to select promising varieties as genitors in blueberry breeding programs.

Key words: *Vaccinium corymbosum L., organoleptic evaluation, consumer preferences.*

PRODUCTIVITY AND FRUIT QUALITY OF SOME CHERRY VARIETIES CONDITIONED BY TECHNOLOGICAL AND CLIMATIC ELEMENTS IN THE ROMANIAN PLAIN

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Abstract

Due to the consumer preference, the consumption qualities and the early presence on the fruit market, the cherry is an important crop at the national and global level. It ensures high productions, important incomes through relatively simple technologies and the processing is diverse. The quality of the fruits depends especially on the genetic characteristics of the variety and the pedoclimatic conditions, although it can also be influenced by the rootstock and the applied technological elements. The experiments took place at the Baneasa fruit tree research station and the Moara Domneasca fruit farm. The purpose of this study is to evaluate the productivity and fruit quality of 5 varieties of cherry, grafted on various rootstocks, conditioned by the technological elements applied in the pedoclimatic conditions of the Romanian Plain area.

Key words*: cherry, productivity, quality, technology.*

DETERMINATIONS REGARDING THE PERCENTAGE OF KERNELS OBTAINED THROUGH DIRECTED HYBRIDIZATION OF THE APRICOT SPECIES AT SCDP CONSTANȚA

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Abstract

As climate changes are more and more evident, obtaining new elites in order to improve the assortment of apricots, with new varieties, having high agrobiological potential, requires a better selection of parental lines used for directed hybridization. In order to obtain hybrids with a high potential, the apricot varieties Elmar, De Valu, Augustin and Amiral were taken into consideration. The combinations used were the following: Elmar x De Valu, Elmar x Augustin, Admiral x Elmar. From the total of 2,500 hybridized flowers, a number of 150 viable kernels were obtained, resulting in a percentage of 6%, which means that there are factors that influence the hybridization process. High numbers of viable kernels were observed to be correlated with favorable weather conditions for the crop in that year. The research took place in the experimental fields of SCDP Constanta. They were planted in 2011, the planting scheme is 4/4 m, in an irrigated system. The trees are at full maturity, benefiting from an agricultural technique specific to the crop.

Key words: *Prunus armeniaca, cultivars, yields, kernels.*

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

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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.*

INFLUENCE OF GENOTYPES AND THE STORAGE TIME ON PEARS QUALITY INDICATORS

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Abstract

In order to study the changes in the quality of the fruits during the storage time, the late ripening seven Romanian genotypes and two international cultivars used as control. Genotypes were refrigerated for different periods of time under conditions of 4°C and 75% humidity. Fruit quality indicators: flesh firmness, skin color, pH, total dry weight, total soluble solids content, titratable acidity, total polyphenols content and vitamin C were evaluated starting at the time of fruit harvesting and continuing in the interval 60, 90 and 120 days after harvesting. All tested pear genotypes retained a hight level of quality after 60 days. The degradation of organic acids and vitamin C, the increase followed by decrease in the level of sugars and total dry weight per mass unit in fruits was influenced by the duration of storage. In the Romcor cultivar, firmness and the average weight decreased significantly compared to the other genotypes. The obtained results were significantly influenced by the genetic characteristics and the time of storage.

Key words*: biochemical characteristics, pear quality, postharvest storage.*

FRUIT QUALITY OF NINE BLACKCURRANTS (*RIBES NIGRUM* L.) CULTIVARS SELECTED IN MEADOW ARGEȘ

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Abstract

In Romania, the blackcurrant is an appreciated crop due to the nutritional and therapeutic value of the fruit. Therefore, the study aims to identify the potential parental plants with superior quality indicators that can contribute to the breeding program and stimulate the sustainable development of black currants. Phenological observation, physical and chemical characteristics responsible for fruit quality of nine cultivars 'Abanos', 'Ben Hope', 'Ben More', 'Ben Nevis', 'Bona', 'Geo', 'Joseni17', 'Poli 51' and 'Tiben' were evaluated under the conditions of the Meadow Argeș during 2022-2023. In this sense, the results of biometric determinations (weight, fruit firmness) and biochemical quality indicators (total water content, pH, soluble solids, titratable acidity, total sugar, and vitamin C content) of the fruits are presented. The study found that 'Bona' and 'Ben More' cultivars produce the largest fruits, while 'Geo', 'Poli 51', 'Tiben', 'Ben Nevis', and 'Abanos' cultivars have higher total sugar content. These findings can guide breeders in selecting suitable parent plants for controlled hybridization to improve fruit size and biochemical quality in future generations.

Key words*: biochemical characteristics, fruit quality, phenology, vitamin C.*

AGROPRODUCTIVE EVALUATION OF SOME SWEET CHERRY CULTIVARS IN THE PEDOCLIMATIC CONDITIONS OF N-E ROMANIA

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Abstract

The sweet cherry (Prunus avium L.*) can be one of the most profitable fruit crops grown in temperate climates, highly appreciated worldwide due to the taste, color and nutritional value of the fruits. This study was carried out in the 2021-2023 years using some foreign ('Regina', 'New Star' and 'Kordia') and autochthonous cultivars ('Bucium' and 'Maria') from the Research Station for Fruit Growing (RSFG) Iasi. The aim of this research was to evaluate the productivity in the context of current climate change by determining the main physical and biochemical characteristics of the fruits (weight, diameter, color, sugar composition, titratable acidity and vitamin C), the total fruit production as well as the productivity index related to the trunk section area. The obtained results were interpreted statistically and although there was a variability between the experimental variants, the local cultivars present characteristics that allow agrobiodiversity and a better planning of future improvement programs.*

Key words*: fruit quality, growth, production, Prunus avium* L.

INFLUENCE OF THE BIOLOGICAL CHARACTERISTICS OF THE VARIETY ON THE PRODUCTIVITY OF THE PLANTATION AND THE QUALITY OF THE APRICOT FRUITS DURING THE FRUITING PERIOD

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Abstract

The researches were carried out in the spring of 2015 from the company SRL "Agroparc Management", located in the southern part of the country. As biological research material, trees from apricot varieties were used: Wonder Cot, Magic Cot, Spring Blush, Lilly Cot, Perle Cot, Pinkcot, Sweet Cot, Orange Red, Big Red, Faralia, Kioto and Farbaly. The Orange Red variety was taken as a control. The varieties were grafted onto Mirobalan 29C rootstock. The trees formed by open vase crown type. Planting distance 5.0 x 3.0 m. The lot is not irrigated. The soil between the intervals, between the rows and between the trees in the row was maintained as black field. The atmospheric precipitation that fell in abundance in the months of April (73.6 mm) and May (46.0 mm) in the southern part of the country had a considerable impact on the quality of the fruits of the early ripening apricot varieties (Wonder Cot, Spring Blush, Magic Cot, Pinkcot). Medium and late ripening cultivars had slower fruit development due to insufficient moisture during the development period.

Key words*: apricot, variety, fruit, average weight, production, quality.*

A REVIEW OF BLACKCURRANT CULTURE TECHNOLOGY

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Abstract

As consumers increasingly prioritize health and wellness, the nutritional profile of blackcurrants, with its mix of vitamins, antioxidants, and anti-inflammatory properties, positions them as a valuable addition to a balanced and nutrient-rich diet. Blackcurrants are valued for multiple reasons, with distinct attributes that contribute significantly to their prominence. They are recognized for early fruit-bearing, consistently high yields, and adaptability to diverse climatic and soil conditions. These attributes enhance the economic viability of cultivating blackcurrants, contributing to their widespread popularity among fruit growers. This review aims to provide a screening of the cultivation technologies for the blackcurrant crop, focusing on specific characteristics such as planting, soil management, fertilization, irrigation, pruning, disease and pest management. This paper can be a useful tool for anyone interested in blackcurrant crop technology.

Key words*: disease, fertilization, irrigation, pruning, soil management.*

MULBERRY FRUITS SOURCE OF BIOMINERALS AND BIOACTIVE COMPOUNDS

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Abstract

The present study aimed to establish the chemical composition of white (Morus alba L.) and black (Morus nigra L.) mulberry fruits grown in the West Region of Romania. This study investigated mineral compositions, fat content, total antioxidant capacity, total polyphenols content, vitamin C (ascorbic acid), pH, and total soluble solids content. White mulberry displayed the highest total fat content, while in Morus nigra the highest total phenolic contents were observed. The interaction between fruit colour and sampling location showed a significant effect on antioxidant capacity. The total antioxidant capacity was analyzed by using the spectrophotometric method - CUPRAC method and the total polyphenols content was evaluated by the Folin-Ciocalteu method.

Key words*: mulberry species, minerals, fat content, total polyphenols, antioxidant capacities, CUPRAC method.*

ANALYSIS OF THE PHENOPHASES OF GROWTH AND FRUITING OF RASPBERRY VARIETIES IN THE CLIMATIC CONDITIONS OF BUCHAREST

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Abstract

The objectives of the research consist in assessing the intensity of the processes that determine the physiological growth of raspberry plants of the Delniwa variety and the Opal variety, which influence the fruiting process and the production of fruits per plant. In the framework of the experiment, the growth and fruiting of the two raspberry varieties under the influence of climatic factors from the experimental location of the raspberry culture established in 2023 within the INMA Bucharest was monitored. Thus, observations were made on the development of the main phenophases of the vegetative organs (foliar) from which the leaves and shoots developed and the fruiting organs (generative / floriferous) from which the flowers developed, hence the harvest. For both varieties, five representative plants of each variety were chosen for monitoring, from which the following parameters were measured every month of the crop`s evolution: the number of shoots, the length and diameter of the stem, the sizes of the fruits and receptacles, as well as the accumulated amounts of fruits specific to each variety analyzed.

Key words*: climatic factors, phenophases, fruits, varieties, raspberries.*

EVALUATION OF SOME ESSENTIAL ELEMENTS IN WALNUT KERNEL

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Abstract

The paper presents the results in determining essential element content in walnut kernel marketed in agri-food markets in Timișoara (Romania) and in estimating the supply of minerals of this food drug. Results of mineral elements analysis through flame atomic absorption spectrometry show that walnut kernel analyzed contains increased amounts (mg/100 g) dry matter of K (338-457), Mg (163–270) and Ca (62.60-119) and significant amounts of Mn (2.56-10.40), Fe (l.19-5.58), Zn (1.23-3.58), Na (0.75-6.45), Cu (0.58-3.14), Cr (0.08-0.60), unevenly distributed according to the origin of the kernel and the nature of the analyzed element. The results obtained when evaluating the mineral intake, show that a consumption of 25 g of walnut kernel contributes differently to ensuring the daily mineral needs: is not of interest from the point of view of the contribution of Na, Ca and K, but can cover significant percentages of the required Zn, Fe and Mg and high Cr, Cu and Mn. Given the results of our experiment, we can say that the analyzed walnut kernel can be considered as a good additional source, especially of Cr, Mn, Cu, Mg and less as the source of Zn and Fe.

Key words*: walnut kernel, essential element, mineral intake.*

THE INFLUENCE OF SOME ENVIRONMENTAL FACTORS ON APPLE AND CHERRY TREE OF FLOWERING PHENOPHASES

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Abstract

In Romania, among the favourite fruits for consumption are the cherries during the summer and the apples throughout the year. In the context of current climate changes, knowledge of fruiting phases and their evolution is of major importance for fruit growing. We recorded the phenological observations according to the specialized methodological norms together with the beginning of bud swelling of the flowers in 2 species: apple and cherry tree. The research on this study was carried out by: accessing specialized information on fruiting phases, daily photos of phenophases, recordings of temperature and precipitation provided by the Bacău weather station. Geographic coordinates were recorded taking into account the GPS coordinates of each tree tracked. The spatial distribution of the tracked trees includes Bacău and Neamț counties. Knowing the evolution of the fruiting phases according to the evolution of environmental factors allows specialists to establish the treatment and fertilization programs that support the most important phenological moment that determines the production on the tree, also find the optimal solutions to increase the degree of natural fertility and avoid pests.

Key words*: phenological observations, natural productivity, cherry, apple.*

CLIMATE CHANGE AND THE NATURAL INFECTION OF APPLE TREES WITH *ERWINIA AMYLOVORA* BURRILL IN NORTHERN TRANSYLVANIA

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Abstract

Considering the high level of risks that infection with the bacteria Erwinia amylovora has in apple orchards in Romania, we have undertaken four consecutive years (2019-2022) investigation in terms of fire blight occurrence. In the experimental plot's typical symptoms, such as wilted or necrotic shoots in the form of 'shepherd's crook, were visible for two consecutive years (2021-2022), while flower clusters were not affected. The highest damage degree was observed in 2022, when was recorded the least amount of precipitation in the May-June period, but accompanied by extreme phenomena, such as strong winds. At the same time, during the study, the average daily temperatures in the case of May were the highest in 2022, respectively the second highest, in the case of June, being exceeded only by June 2019. According to our observations, the climate changes in the area, which consist of both the increase of the average annual temperature and the occurrence of some extreme phenomena with greater frequency, are favoring factors to increase the occurrence of Erwinia amylovora and amplify the fire blight symptoms in apples.

Key words*: average temperature, bacterial disease, fire blight, young shoots.*

THE MINERAL PROFILE OF SOME PLUM (*PRUNUS DOMESTICA)* VARIETIES

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Abstract

This study aims to determine the concentration of some essential and toxic mineral elements from four plum varieties harvested from the orchard of the Lugoj area. The metallic elements were determined by the atomic absorption spectrometry method in flame. Phosphorus was determined in the form of molybdenum blue by spectrophotometric method. The obtained results show that the analysed plum varieties ('Record', 'Vinete românești', 'Čačanska lepotica' and 'Stanley') contain important quantities of essential elements unevenly distributed: 898-1.897 mg/kg K, 165 - 429 mg/kg Ca, 119-315 mg/kg Mg, 216 - 497 mg/kg P, 3.353-4.233 mg/kg Fe, 0.306-0.726 mg/kg Mn, 0.306-1.488 mg/kg Zn, 0.780-2.088 mg/kg Cu, 0.032-0.198 mg/kg Cr and very small amounts below the lead limits. No significant amounts of Ni and Cd were detected. The results obtained following evaluation of the mineral intake show that, in the present conditions, the degree of coverage of the daily mineral requirement varies in wide limits, depending on the variety of fruit, consumer and the nature of the mineral element.

Key words*: mineral intake, minerals, Prunus domestica, varieties.*

PEACH RESPONSE TO WATER DEFICIT UNDER THE CLIMATIC CONDITIONS OF SOUTH-EASTERN ROMANIA

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Abstract

In arid and semi-arid regions, the research and application of new irrigation techniques that economize water without altering tree performance and fruit quality is a challenge. In the present work, the impact of water deficit irrigation applied to peach trees was evaluated. In the context of global warming, saving water is a major goal. The studied crop was peach, Catherine sel. 1 cultivar, fourteen years old, grafted on rootstock Tomis 1. The planting distance was 4 m between rows and 3 m between trees in the row. The split-plot experiment described here is monofactorial, with the irrigation strategy having three gradations. The irrigation regime consists of a fully irrigated treatment T1 (100% ETc), a deficit irrigation treatment (T2), irrigated with half the amount of water in T1 (50% ETc), and a control, non-irrigated treatment (T3). The paper describes the quality of fruits for three years of study, 2020, 2021 and 2022, and 2022, respectively, in the semi-arid region of Dobrogea, Romania. The study suggests that moderate water stress can be profitable for enhancing key fruit quality characteristics.

Key words*: Prunus persica (L). Batsch, irrigation, soil water potential, quality fruit.*

MORPHOLOGICAL VARIABILITY OF SOME ROSEHIP FRUITS (*ROSA CANINA* L.) FROM THE SPONTANEOUS FLORA OF OLT COUNTY, ROMANIA

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Abstract

The present work aimed to analyse the variability of some genotypes of Rosa canina L. from some forest ecosystems located in the southern area of Olt County. Nine rosehip genotypes were subjected to the study, in which the morphological variability of the fruit was analysed starting from the dimensional and weight characteristics. It was found that there is a high variability between genotypes, highlighted by the Coefficient of Variability for weight (CV%=32.86), height (CV%=12.61), small fruit diameter (CV%=12.47), and large fruit diameter (CV%=12.33). The high existing variability is an essential factor through the presence of these genotypes and their usefulness as a sustainable resource in diversifying the fruit tree material.

Key words*: rosehip, fruits, genotypes, variability, Coefficient of variation.*

SOUR CHERRY GERMPLASM RESOURCES AND BREEDING IN ROMANIA

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Abstract

In Romania, after 1970, identification, conservation and evaluation of fruit genetic resources activities were started in order to limit the loss of the biodiversity due to erosion and genetic vulnerability. Regarding the sour cherry germplasm, there is a rich fund, located in Research Institute for Fruit Growing Pitești, Romania with 170 accessions, representing wild species, local population, cultivars and selections. In the breeding work de main objectives are: self fertility, productivity, tolerance / resistance to diseases, fruit quality for fresh market, ripening season extension. Taking into account these objectives, over time were used different genitors from genetic resources fund: 'Timpurii de Cluj', 'Timpurii de Pitești', 'Țarina', 'Bucovina', 'Scuturător', 'Amada', 'Stelar', 'Dropia', 'Ilva' for resistance/tolerance to Monilia and anthracnose; 'Pitic', 'Bucovina', 'Vrâncean', 'De Botoșani', 'Rival', 'Amada' for late blooming; 'Timpurii de Cluj', 'Crișana 2', 'Sătmărean', De Botoșani', 'Rival', 'Amada', 'Stelar' for fruit quality; 'Rival, 'Țarina', 'Stelar' for productivity; Ilva', 'Nana', ' Vrâncean', 'Bucovina', 'Sătmărean', ' Pitic' for self fertility. Using a different method (selection, crossing, open pollination) 19 cultivars were registered with a very good agrobiological characteristics, many of them are propagated and spread in the Romanian orchards ('Timpurii de Pitești', 'Țarina', 'Ilva', 'Pitic', 'Bucovina', 'Vrâncean', 'De Botoșani', 'Rival').

Key words*: sour cherry, germplasm, breeding, genitors, cultivars.*

COMPARISON APPLE BIO PRODUCTION ON CULTIVATED AND GRASSED AREA

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Abstract

Biological agriculture is an important priority in the thematic priorities of the European scientific programs and in agricultural development policy in each country. This article presented apple bio production in the territory of the village of Yagodovo, Plovdiv district, Bulgaria. Growth parameters are monitored on two types of areas - cultivated and grassed. The analysed indicators are cross-sectional area of the stem, average weight of fruit, number of fruits per tree, productivity coefficient. Each of the parameters has a different impact on the biological development of the fruits. The results show better values when growing on a grassed area compared to a cultivated area, regarding the parameters: average weight of fruit, number of fruits per tree and productivity coefficient. The indicator `cross-sectional area of the stem` has a better result when growing apples on a cultivated area than on a grassy area. The results for each of the indicators are presented in a digital model by Geographic Information System-GIS, in order to more fast, rational and modern use of technology by young farmers.

Key words*: apple growing parameters, organic production, cultivated area, grass plot area, GIS.*

CHANGES IN PHENOLOGY OF SERBIAN PLUM VARIETIES UNDER AGROECOLOGICAL CONDITIONS OF THE CENTRAL BLAKAN MOUNTAIN REGION IN BULGARIA

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Abstract

For the period 2019-2022, the phenological manifestations were studied of the Serbian plum cultivars such as 'Čačanska rana', 'Čačanska najbolja', 'Čačanska lepotica', 'Čačanska rodna', and 'Valjevka' and their response to climatic factors such as temperature, rainfall, relative air humidity in RIMSA-Troyan. The trees are grown on light gray forest soil, under non-irrigated conditions, with tillage between the inter-row spacing. The phenophases were studied, such as the beginning of flowering, end of flowering, and fruit ripening periods. The earliest flowering began in 2019 for 'Čačanska rodna' cultivar (28.03.), and the latest flowering began on 6.04.2019 for 'Kyustendilska plum'. In the following years, spring temperatures delayed the vegetation onset and the beginning of flowering was around 07.04 for 'Čačanska lepotica', followed by 'Čačanska rodna' (10.04.) and 'Čačanska najbolja' (12.04). The latest end of flowering was reported on 7-8 May 2022 ('Valjevka' and 'Kyustendilska plum'). For the entire study period, the phase from flowering to harvest maturity was shortened. To obtain favorable conditions for growth and fruit-bearing in the Central Balkan Mountain region, the introduced Serbian cultivars require changes in cultivation technology and adaptation to changes in the global climate.

Key words*: climatic factors*, *phenology, plum cultivars.*

THE INFLUENCE OF INTERANNUAL CLIMATE VARIATION ON THE PHENOLOGY OF SOME WILD FRUIT SPECIES AND THEIR RELATION WITH AVIFAUNA

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Abstract

This paper aimed to investigate the influence of interannual climate variation on the phenology of some wild fruit species and their relationship with avifauna. For this study, wild fruit species such as blackthorn, red and black hawthorn, dog rose, European crab apple, wild pear, elder, dewberry, and some bird species such as white and black stork, common cuckoo, Eurasian hoopoe, barn swallow, and European bee-eater were monitored. The observations were carried out in an ecosystem from the southern part of Oltenia, Romania, during the period 2019-2021. From the three years of study, 2021 stood out with an extension of the spring season, which influenced both plant phenology and the behaviour of bird species. It turns out that the presence of wild fruit species is essential in terms of the provided ecosystem services from an ecological and ecosystem balance point of view.

Key words*: BBCH, birds, phenology, spring, wild fruits.*

FRUIT QUALITY OF APPLE VARIETIES CULTIVATED IN AN ORGANIC SYSTEM

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Abstract

Apple is an important crop in many European countries. There is a growing interest, from consumers, for fruits obtained through ecological cultivation techniques. In order to satisfy this demand, some products compatible with ecological agriculture were tested applied to the soil and foliage of an apple crop in the Arges Meadow. The aim of this study was to evaluate the impact of organic fertilizers on production quality. Larger fruits were obtained from the organic treatments. The results also indicate a surplus of malic acid, sugars and total phenols in all varieties compared to those in the control variant. We conclude that through radicular and extraradicular fertilization, the apple varieties 'Romus 3', 'Idared' and 'Golden Delicious' have a higher nutritional quality.

Key words*: apple, organic fertilization, fruit quality, biochemical characteristics*

RESEARCH ON THE INFLUENCE OF ORGANIC FERTILIZERS ON THE AGROCHEMICAL INDICATORS OF THE SOIL

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Abstract

The aim of this study was to evaluate the influence of organic fertilizers on some soil agrochemical indicators, such as: soil reaction (pH), content of soil in organic carbon, humus, total nitrogen, total phosphorus and total potassium. Research was carried out in an apple demonstrative plot established in 2010 at Mărăcineni, in a private farm from Arges County. In 2022 the following fertilization variants were applied: V1 – Unfertilized; V2 - Biohumus – 0.5 l/tree, soil application + Macys BC 28 – 2 l/ha, foliar application + Cifamin BK – 1 l/ha, foliar application; V3 - Biohumus – 0.7 l/tree, soil application + Macys BC 28 – 2 l/ha, foliar application + Cifamin BK – 1 l/ha, foliar application; V4 – Biohumus – 0.9 l/tree, soil application + Macys BC 28 – 2 l/ha, foliar application + Cifamin BK – 1 l/ha, foliar application; V5 – manure – 20 t/ha. The following determinations were carried out: pH in aqueous solution mix soil: water = 1: 2.5 (potentiometric method); organic carbon according to the Walkley Black method, respectively the humus by calculation; the total nitrogen was determined by the Kjeldahl method; the total phosphorus was determined spectrophotocolorimetric, the Egner-Riehm-Domingo method; the total potassium was determined flamphotometrically from the same extract obtained when determining the phosphorus. Fertilization with manure in a dose of 20 t/ha (V4), has led to an improvement of soil acidity, increased soil content in humus, nitrogen, phosphorus and potassium compared to the unfertilized variant and with the other fertilization variants.

***Key words**: humus, nitrogen, phosphorus, potassium, soil reaction.*

FRUIT QUALITY ASSESSMENT IN RASPBERRY BREEDING

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Abstract

The available raspberry cultivars are rapidly changing, highlighting the need for improvement in raspberry cultivars. Fruit quality assessment is crucial for red raspberry assortment breeding, with being essential for consumer acceptance. This study aimed to characterize raspberry fruits from different progenies morphologically. The data collected included average fruit weight, shape index, colour and soluble solids. The results showed significant variation in fruit weight and soluble solids content among the progenies. The fruit weight ranged from 2.50 g / fruit ('16-22-4') and 3.52 g / fruit ('16-22-5') and the soluble solids content: 11.20 °Brix ('16-23-20') and 17.30 °Brix ('16-1-23'). Based on the fruit quality, certain genotypes were identified as promising for future steps in the breeding program, including '16-1-10', '16-1-11', '16-1-22', '16-22-5', '16-22-11' and '16-23-20'.

Key words*: Rubus idaeus, selection, fruit weight; soluble solids content; colour.*

QUALITY OF SOME STRAWBERRY CULTIVARS IN RELATION WITH CONSUMER PREFERENCES

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Abstract

Strawberries (Fragaria x ananassa) are among the first fruits consumed in Romania, being appreciated for their flavour and special nutritional qualities. In the evaluation of the quality of the strawberry fruit, consumers appreciate the fruit appearance, taste and aroma. The aim of this paper was to analyse fruit quality of some strawberry cultivars in relation with consumer preferences. The research took place out at Small Fruit Department of Research Institute for Fruit Growing, Pitești on 10 strawberry cultivars with different origin. The data were collected for: fruit weight, length, diameter, firmness, the soluble solids, acidity, five colour indicators, and sensory evaluation. The results showed significant differences between cultivars regarding the shape index, the fruit firmness and the highest value of content in total soluble solids was recorded by 'Vibrant' followed by 'Clery'. Regarding the panel test of the fruits the general score ranged between 5.58 ('Vibrant') to 8.22 ('Matis'). 'Sarom' had the highest weight, dark red fruit colour and balanced taste.

Key words*: Fragaria x ananassa, fruit quality, panel test, cultivars.*

INFLUENCE OF THE PROTECTIVE NETS ON FRUIT PRODUCTION IN MODERN ORCHARDS - A REVIEW

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Abstract

The protective nets and screens have become indispensable features in many fruit crops such as apple, cherry, kiwi, apricot, grapevine and berries. Considering climate changes, the protective nets contribute both to creating a safe environment for plants by controlling hail and reducing wind, but at the same time they have an important role in reducing excessive solar radiation, pests attack, while maintaining a suitable microclimate for the crop. The net color and density influences most of the physiological processes in plant with important effect on growth, yield and fruit quality. The paper presents the main scientific results regarding the influence of protective nets on mentioned parameters.

Key words*: protection system, anti-hail net, solar radiation, yield, fruit quality.*

EFFECTS OF MODIFIED ATMOSPHERE PACKAGING ON QUALITY FEATURES OF 'FAVORIT' APRICOT CULTIVAR DURING COLD STORAGE

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Abstract

Apricots are stone fruit highly perishable and their limited post-harvest life is a problem for marketing. Low-cost postharvest techniques should be employed to extend the shelf life of fresh fruit and reduce postharvest losses. Apricots were packaged using 2 types of polypropylene films: microperforated and non-perforated and then stored at 1°C to study the effects of modified atmosphere packaging (MAP) on the maintenance of fruits quality and optimum storage time by comparison with non-wrapped fruits. Dry matter, weight, firmness, soluble solids content, titratable acidity, color, respiration rate, and ethylene production were evaluated. Apricots sealed in non-perforated plastic films at low temperature had an extended marketable life of around 15 days. Our results indicate that apricot fruit in non-perforated films showed lower weight loss, firmness and TA, as well as higher sugar content during storage. The respiration rate and ethylene production were lower in MAP package treatments than in control fruits.

Key words: *stone fruit, ethylene production, quality, low temperature, postharvest techniques.*

BIOLOGICAL AND ECONOMIC CHARACTERISTICS OF PLUM CULTIVARS GROWN IN TWO PLUM-PRODUCING REGIONS OF BULGARIA

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Abstract

A comparative study was done on the biological and economic characteristics of plum varieties of Prunus domestica L. grown under agroecological conditions of Lovech (RIMSA – Troyan) and Gabrovo regions (the Plum Experimental Station Dryanovo). The observations were conducted in the period 2019-2021 of the varieties such as 'Čačanska lepotica', 'Čačanska najbolja', 'Čačanska rodna', 'Gabrovska', 'Strinava' and 'Stanley', selected for the control. The phenological phases of flowering and harvest maturity of the fruits were determined. Biometric measurements and the chemical composition of fresh plum fruits were made. It was found that the fruits of the large-size varieties such as 'Čačanska lepotica' and 'Čačanska najbolja' had an average weight (41-48 g) for the Troyan region, and 42-45 g for the region of Dryanovo, which are suitable for fresh consumption. The fruits of the 'Čačanska rodna', 'Strinava', and 'Gabrovska' contain over 20% dry matter in both regions, which makes them suitable for drying and distillation. The studied plum varieties are suitable for growing in the study areas and may be recommended for the expansion of the variety assortment in the establishment of new plum plantations for fresh consumption and processing.

Key words*: biometric measurements, chemical analysis, phenology, plum, variety.*

ANALYSIS OF THE TOTAL LIPID CONTENT IN THE KERNELS OF SEVERAL TEMPERATE NUT CROPS ACCESSIONS FROM THE GERMPLASM COLLECTIONS OF UCv-SCDP VÂLCEA, ROMANIA

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Abstract

Lipids are an important group of compounds that provide several biological functions such as: energy storage, cell membrane structure, and signaling. This study has the aims to investigate the total lipid content of fruits belonging to temperate nut crops like walnut (Juglans regia L.*), pecan (Carya illinoinensis), and hazelnut (Corylus avellana* L.*) using the extraction method based on different solvents. The analyzed kernels were collected from six walnut accessions ('Valcor', 'Jupâneşti', 'VL 51 B', 'Payne', 'Lara', and 'Franquette'), one pecan hybrid selection (H 21-13 - 2008) and six hazelnut cultivars ('Valcea 22', 'Romavel', 'Ennis', 'Daviana', 'Du Chilly', and 'Purple Filbert'), all from the germplasm collections of Fruit Growing Research and Extension Station (SCDP) Valcea. The FTIR spectroscopy using attenuated total reflectance and suitable variables (absorbance values at certain wavenumbers) of nut oil samples was utilized at frequency regions of 4000–400 cm^{-1}. The colorimetric sulfo-phospho-vanillin method developed by Van Handel (1985) was used in order to determinate the total lipid content. The results obtained after analyzing the nut kernels emphasized inter- and intraspecific variation depending on the genotype and the solvent used.*

Key words*: walnut (Juglans regia* L.*), pecan (Carya illinoinensis), hazelnut (Corylus avellana* L.*), total lipid content, lycopene, β-carotene, ATR-IR spectroscopy.*

FROST EVENTS FORECAST USING MACHINE LEARNING IN BULGARIA

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Abstract

In the present study a scheme for damaging frost occurrence forecast in Bulgaria is presented. It is based on Random Forest technique and uses the regional numerical weather prediction (NWP) model ALADIN output as predictor. Initially, the statistical model is trained with measured data with three-hours frequency at 5 representative meteorological stations in Bulgaria during April and May for the period 1991-2020. Using parameters from the regional NWP model production as predictors gives possibility to forecast frost probability 72 hours ahead. The performance of the scheme is evaluated. Results for 27 synoptic stations during April (2021-2023) show a probability of detection above 0.85 and a false alarm rate below 0.1 independently of the remoteness of the forecast. Most of the considered cases were correctly discriminated by the scheme as "frost" and "non-frost" cases, which would not be the case if only considering the forecasted minimum temperature. Our results show that frost could be forecasted by the presented scheme 3 days before its occurrence, which should be enough to react to minimize damage caused in the agricultural sector.

Key words*: frost, forecast, Random Forest, Bulgaria.*

SENSORIAL EVALUATION OF ORGANIC STRAWBERRIES AND RASPBERRIES: EFFECTS OF COMPANION PLANTS

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Abstract

Consumers' demands for high-quality organic fruits in terms of taste and nutritional content, including berries production, have showed an increasing trend. Raspberries and strawberries are two of the most appreciated fruits that contain high amounts of bioactive compounds and micronutrients, essential for their special taste, nutritional values, and organoleptic qualities. Introducing companion plants in berry crop production is an organic method that enhances fruit quality, aligning with consumer preferences. A preliminary sensorial test evaluated how cultivation techniques influence berries sensory characteristics. Consumer acceptance was gauged using a 7-point hedonic scale, assessing properties like color, smell, taste, and re-consumption intention. Both strawberries and raspberries were preferred by at least 70% of evaluators, which labeled with a significantly higher preference level. The result from this study can help in identifying consumers' behavior, providing new insights for exploring the role of biodiversity in organic berry orchards.

Key words*: consumer acceptance, berry crops, quality, intercropping.*

RESEARCH ON THE DEVELOPMENT OF RASPBERRY CULTIVATION IN CONDITIONS OF ORGANIC AGRICULTURE

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Abstract

This paper highlights the evolution of raspberry culture between March and November 2023 on a 1000 m certified organic field in the Bucharest Region. It is based on data obtained during the specified period, monitoring soil parameters at the beginning of the establishment of the crop of two species of raspberries, namely: Opal variety and Delniwa variety. The two varieties were divided into two rows, each occupying half of the total area. The results obtained were evaluated both per variety and per row. There were observed differences between varieties but also between rows in terms of the amount of fruit obtained, in each month of the harvest period. These results support farmers, highlighting varieties suitable for organic crops in the monitored area.

Key words*: raspberries, culture, ecological, development, yield.*

NORTHERN BANANA OR PAW-PAW GROWN IN SOUTHERN ROMANIA SANDY SOILS

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Abstract

The Northern banana (Asimina triloba L.) or paw-paw is one of the fruit tree species belonging to the Annonaceae Family, which behaves very well in areas with a temperate climate and is considered here an exotic species. In Romania it was introduced in 1926, but until now there are no commercial orchards. In 2019, seven genotypes were planted at SCDCPN Dăbuleni, which were evaluated by the growth capacity, productive capacity, and fruit quality. Following the study, the Mary Foos genotype stood out with an average length of the annual shoots of 71cm, an average fruit weight of 182 g/fruit and a fruit yield of 4.6 to/ha.

Key words*: shoots length, fruit quality, yield.*

RESULTS REGARDING THE STERILIZATION EFFECTIVENESS OF PLANT MATERIAL IN SOME STONE FRUIT SPECIES ROOTSTOCKS

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Abstract

This paper present results regarding the sterilization effectiveness of plant material appplied to peach, plum and apricot rootstocks explants necessary for the initiation of the in vitro culture. The research was conducted at the Complex Laboratory of Tissues and Virology within the Research Institute for Fruit Growing Pitești - Mărăcineni, Romania. For peach, apricot and plum rootstocks tissue culture initiation two presterilization agents (sanitary alcohol and ethanol) and two sterilization agents (sodium hipochlorite and calcium hipochlorite) where tested in 16 different variants. The explants (shoot-tips and nodes) were cultured in MS (Murashige and Skoog, 1962) basal medium supplemented with 20g sucrose, as carbon source and 9 g agar. The growth camber for the in vitro culture had 22 ± 2˚C temperature, with a photoperiod of 16h day light and 8h dark. The most effective treatment among the different sterilization variants with 54.16% survival rate was V9 (sodium hipochlorite for 10 min) and V14 (calcium hipochlorite 6% for 20 min). After sterilization, shoots continued to grow and the multiplication phase initiated.

Key words*: sodium hypochlorite, calcium hypochlorite, sterilization, explants, rootstock.*

IS SYMPTOMATOLOGY A RELIABLE TOOL FOR PLUM POX VIRUS MONITORING?

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Abstract

Sharka disease, caused by Plum pox virus (PPV), represents an important economically issue of stone fruits growers in Romania. Establishing plum orchards with PPV-free planting material, followed by their virus monitoring and removing infected trees, can contribute to PPV containment. Although PPV monitoring based on symptoms developed combined with serological or molecular assays is recommended for accurate virus detection, such approach is not costly effective in orchards. Therefore, there is under question whether a well recognizing of PPV symptoms developed by infected plum trees can be an acceptable tool for virus monitoring in orchards. To get this information, twenty-seven plum orchards comprising a large assortment of cultivars were surveyed. A total of 540 samples were tested by DAS-ELISA and compared with results of visual observation. Overall results revealed a high coincidental data of PPV infection established by serological detection and virus-based symptoms, suggesting that a good knowledge of PPV symptoms developed by infected trees on leaves could be a reliable tool for virus monitoring large areas of plum orchards.

Key words*: DAS-ELISA, plum, PPV symptoms, Sharka disease, survey.*

AN ASSESSMENT OF CURRENT STATUS, FUTURE TRENDS AND OPPORTUNITIES FOR IMPROVING EXOTIC AND UNDERUTILIZED POME FRUIT SPECIES PRODUCTION IN ROMANIA

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Abstract

With changing climatic conditions, some of the subtropical and tropical species adapt to the Northern regions finding more favourable conditions for growth and reproduction. In such context, fruit growing in the temperate regions is undergoing an important change in zoning of the species and introducing new ones that can adapt in the new ecological conditions. Species as: goji berry (Lycium chinense Mill.), saskatoon berry (Amelanchier alnifolia (Nutt) Nutt. ex M. Roem)*, pawpaw (Asimina triloba (L.) Dunal), kiwi (Actinidia deliciosa* (A. Chev.) C.F.Liang & A.R.Ferguson)*, pomegranate (Punica granatum L.), kaki (Diospyros kaki Thunb.), ziziphus (Ziziphus jujuba Mill.), fig (Ficus carica L.) and medlar (Mespilus germanica L.) have a high ecological plasticity and potential to adapt in the new environment. Also, an opportunity for growing these species into culture is that the Romanian consumers tend to be more curious and willing to try new fresh products so, there are emerging new opportunities for local producers and marketing these pome fruits with high nutritional potential and taste appeal.*

Key words*: climate change, zoning, fruit growing, ecological plasticity.*

VITICULTURE AND OENOLOGY

IMPACT ON UV-VISIBLE SPECTROSCOPY PARAMETERS OF TAMAIOASA ROMANEASCA WINES FROM MUSTS CLARIFIED WITH PEA PROTEIN BASED FINING AGENTS

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Abstract

Pea protein is a plant-based fining agent recently approved for the clarification of musts and wines. Vegetal proteins are intended to replace the classical fining agents based on proteins of animal origin or the synthetic polymer polyvinylpolypyrrolidone (PVPP), which both proved very efficient for partial removal of polyphenols, but are less accepted by vegetarian or eco-friendly consumers. As an alternative, pea protein can be used for clarification either alone or in complex products containing other non-animal materials. This paper focuses on the evaluation of several pea protein based fining agents used to clarify the must of Tămâioasa românească, an aromatic grape variety which is vinified with a short maceration, leading to wines with a higher content of polyphenols. Variants with no fining as well as PVPP fining were also produced. For all fining variants, the clarification was performed both with oxygen protection and in the presence of oxygen. UV-visible spectroscopy was used to determine parameters related to the content of phenols in the resulted wines (total phenol index as OD 280 nm, flavonoids as OD 365 nm, CIELab parameters and colour differences), after must clarification and completion of the fermentation.

Key words*: white wine; pea protein fining agents; CIELab, total phenol index.*

THE BIOLOGY OF THE DEVELOPMENT PROCESS IN SOME GRAPE CULTIVARS FOR RED WINES STUDIED ON THE SANDY SOILS OF SOUTHERN OLTENIA

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Abstract

The research carried out in the period 2020-2022 looked at the biological, productive and quality potential of four grape cultivars for red wines (Băbeasca neagră, Haiduc, Novac, Arcaș), studied in the ampelographic collection of the Dabuleni Research-Development Station for Plant Culture on Sands. The obtained results showed that the beginning of bud burst phenophase of these cultivars with grapes for red wines started at temperatures between 11.5-18.2°C, the earliest being the Novac cultivar, which beginning of bud burst between April 16 and May 10. The vegetation period for red wine grape cultivars was between 159-164 days, under the conditions of recording an active heat balance between 3429.4-3491°C. From the point of view of productivity, the Novac cultivar stood out with a grape production of 20479 kg/ha, registering a difference of 6579 kg/ha compared to the control, statistically assured as distinctly significant. The quality recorded at harvest maturity of the grapes revealed values of the content in total sugars between 180 g/l for the Arcaș cultivar and 200 g/l for the Novac cultivar.

Key words*: grapes for wine, grape production, quality.*

EFFECT PHYTOTECHNOLOGICAL FACTORS ON TWO RED WINE GRAPE VARIETIES

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Abstract

Among the most extensively grown plants worldwide are grapes. Numerous religions place a high value on grapes and wine. The objective of the experiment was to examine the impact of varying cluster loadings (30% and 50%) on the yield of two distinct grape varieties ('Zweigelt' and 'Fetească neagră'/ 'Feketeleányka'), both in terms of quantity and quality. The experiment was carried out Mica village, in Mureș County. From the yield numbers, could be deduct that the control variety yielded the highest. The sugar content was highest and the acid level was lowest at 30% cluster load. The values were pretty close at 50% load. In terms of wine production, the 50% load was the most appropriate to the control. In terms of grape berries number, at 'Fetească neagră'/ 'Feketeleányka' the highest values were reached at 50% cluster load and in the case of 'Zweigelt' the highest number was recorded at 30% load.

***Key words**: cluster load, grape varieties, production.*

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THE INFLUENCE OF TREATMENTS WITH AMINO-ACIDS AFTER HAIL FALL ON FETEASCĂ NEAGRĂ GRAPE HARVEST

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Abstract

Some fertilizers containing amino acids could help recover grapevine plants after hail stress and on the quality and quantity of harvest. After the hail damage on April 30th, 2019, three treatments with an amino-acids complex were applied to the grapevine canopy - at 20-25 cm, at 35-40 cm shoot length, and berries growth - on Fetească neagră grapevines at Serve Winery, Dealu Mare vineyard. At harvest, the quality and quantity of grape was tested for treated and untreated variant. The total anthocyanins for the treated variant were 211 mg/100 g FW and for the untreated variant - 198 mg/100 g FW. The content of total polyphenols total was 376 g/100 g FW for the treated variant, significantly higher than the untreated variant 320 g/100g FW. The content of flavonoids for the treated variant was of 147 g/100 g FW significantly lower than the untreated variant 130 g/100 g FW. The treatment with amino acids influenced the quantity and the quality of grape harvest affected by the hail, with significant results.

Key words: *Feteasă neagră, amino-acids treatments, hail, quality, quantity.*

THE EFFECTS OF CLIMATE CHANGE ON VINES IN THE MAIN GROWING COUNTRIES IN EUROPE

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Abstract

Climate change is one of the most urgent problems of contemporary society and has significant consequences for natural ecosystems and economic sectors, including the wine industry. Through this paper, an assessment of the consequences of climate change on vine is proposed, examining how these climate phenomena have influenced the growth cycles, quality and quantity of grape harvest in different European wine-growing regions. Another purpose of this documentation is to analyze available research and data to identify the contributory role of different factors in climate change. It is also intended to identify and analyze the strategies and solutions adopted by winegrowers to face these climate challenges, including the adaptation of grape varieties, the implementation of sustainable agricultural practices and the use of innovative technologies in viticulture. The results of this review underline the need for a proactive approach and international collaboration to manage climate change in the European wine sector.

Key words*: climatic factors, grapes, European region.*

PHENOLOGICAL AND SOME ENO-CARPOLOGICAL TRAITS OF THIRTEEN NEW ROMANIAN GRAPEVINE VARIETIES FOR WHITE WINE (V*ITIS VINIFERA* L.) IN THE CONTEXT OF CLIMATE CHANGE

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Abstract

Thirteen new grapevine varieties for white wines' behaviour were studied between 2015-2019, under climate change conditions in the ampelografic collection of the UASVM Bucharest. During the experimentation period, as compared to the reference period (1981-2010), the average temperature during the growing season increased by 0.75ºC, the average annual maximum temperatures by 1.26ºC, number of hot days by 21, number of very hot days by 6.2 and Huglin index by 140 units. Phenological cycles (budburst to harvest) varied between 138.6 and 140.6 days, with Aromat de Iași and Crâmpoşie selecţionată - the most precocious varieties and Columna - the latest variety, as an average of 5 years of experimentation. Due to the high temperatures during the growing season, phenological stages were anticipated, the harvesting being anticipated by approximately 15-25 days. The highest value of sugar content of must was for Aromat de Iaşi variety (23.33ºBrix) and the lowest value for Astra (19.38ºBrix). Aromat de Iaşi, Crâmpoşie selecţionată and Şarba varieties have been distinguished by the best qualities.

Key words*: climate change, grapevine, new cultivars, phenology.*

RESEARCH ON INCREASING THE ADAPTATION CAPACITY OF GRAPEVINE TO CLIMATE CHANGE - TREATMENTS WITH KAOLIN AND ZEOLITES

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Abstract

Climate change, global warming with the increase of thermohydric stress during the ripening of the berries, the greater frequency of extreme climatic phenomena, etc., produce physiological and biochemical changes in the growth and fruiting of the vine, influencing the production of grapes and especially its quality. The experience carried out in 2022 and 2023 on the 'Fetească regală', under the conditions of the experimental plantation of the UASVM Bucharest Romania, aimed at mitigating the effects of summer thermohydric stress, by applying treatments with kaolin and zeolite in concentrations of 3 and 5%. After applying the treatment, the intensity of photosynthesis and transpiration was determined, the quantity and quality of the harvest. The variant zeolite 5% stood out, where intensity of photosynthesis increased by 7.6 µmol CO_2 m^{-2} s^{-1} in 2022 and 4.45 µmol CO_2 m^{-2} s^{-1} in 2023, compared to the control; and the transpiration rate decreased by 2.24 mmol H_2O m^{-2} s^{-1} compared to the control, in 2022, for the zeolite 3% variant. Also, the concentration of sugars decreased by 3.67ºBrix in 2022 and 1.66 in 2023, for the zeolite 3 and 5% variants.

Key words*: climate change, foliar application, heat waves, kaolin, zeolites.*

CARBOHYDRATE DYNAMICS IN SOME GRAPEVINE (*VITIS VINIFERA* L.) CULTIVARS DURING DORMANCY

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Abstract

The adaptation and resistance of the vine to low temperatures during the dormancy involves the realization of processes of accumulation and dynamics of some biochemical compounds in the tissues. In this study, between November and March (2022-2023), the dynamics of carbohydrates (soluble sugars and starch) was monitored at 10 days in the annual and multiannual vine wood in the 'Cabernet Sauvignon', 'Feteasca neagră' and 'Merlot' from the Banu Mărăcine wine-growing center (plateau-type area, slightly leached reddish-brown soil) and Șimnicu de Sus wine-growing area (slope-type area, medium eroded reddish-brown soil). Regarding the carbohydrate content during the dormancy, significant differences between the two viticultural areas were highlighted only concerning the content of soluble sugars (%) in multiannual wood for the 'Merlot' and 'Cabernet Sauvignon'. As for the starch content (%) in annual woody shoots and in multiannual wood, no statistically significant differences were observed either between the studied cultivars or between the two areas.

Key words*: carbohydrate dynamics, freezing tolerance, dormancy.*

AMPELOGRAPHIC AND BIOPRODUCTIVE CHARACTERISTICS OF CABERNET SAUVIGNON CLONES IN OLTENIA WINEGROWING REGION, SOUTH-WEST ROMANIA

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Abstract

Polyclonal vineyards are a useful technological alternative in the context of climate changes foreshadowed in the medium and long term, through the premises of ensuring a sustainable viticulture, but also the possibility of obtaining complex wines. In the last decade in Romania, various international clones of wine grape varieties have been introduced in vineyards, whose performance in terms of adaptation or their bioproductive and qualitative potential in Romanian vineyards is little known. In this context, the aim of this study was to evaluate and determine certain phenotypic characteristics, as well as the bioproductive and qualitative performance of five Cabernet Sauvignon clones: two of French origin (clones 15 and 338) and three clones of Italian origin (ISV 105, ISV 117 and R5), in the pedoclimatic conditions of South-West Romania. Good fertility results are shown by clones 15 and R5, with ISV 117 clone being the most productive. All clones ensure the quality parameters required for Cabernet Sauvignon DOC wines produced in Oltenia winegrowing region.

Key words*: Cabernet Sauvignon, clones, phenotypic characteristics, grape quality*

ASSESSMENT AND PREDICTION OF GRAPE AND WINE TRACEABILITY: A CASE STUDY OF FETEASCĂ NEAGRĂ AND PINOT NOIR CULTIVATED IN VARIOUS WINE-GROWING REGIONS

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Abstract

The study was conducted between 2022 and 2023 with the aim of tracing specific elements of chemical composition from grapes to wine, focusing particularly on the 'Fetească Neagră' and 'Pinot Noir' varieties. These grape varieties were cultivated in five distinct wine-growing regions across Romania. A significant part of the grape's substances is proportionally transferred into the wine, blending with other beneficial compounds resulting from the conversion of grape must into wine. The correlation between the chemical composition of wine and its derivation from the chemical composition of the grape is a critical factor in forecasting wine quality. The chemical composition of the grapes was assessed at full maturity, and included the following elements: water, proteins, total lipids, ash, dietary fibers, and sugars. The corresponding components were subsequently traced within the wine. The examination took place subsequent to the stabilization of the wines, carried out in anticipation of bottling and consumption. The determination of both grape and wine samples' chemical composition adhered to specific standards validated by the Association of Analytical Chemists.

Key words: *chemical composition, grapes, quality, traceability, wine.*

RESEARCHES CONCERNING THE INFLUENCE OF ENVIRONMENTAL RESOURCES ON THE PHYSIOLOGICAL AND BIOPRODUCTIVE PARAMETERS OF GRAPEVINE

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Abstract

Numerous studies have highlighted the effects of climate change at global and regional levels. The increase in average temperatures is often accompanied by changes in precipitation patterns as well as the higher frequency of extreme weather events. The impact of variation of environmental resources on vines varies from short-term effects (variation in quantity and quality of production) to long-term effects (suitability of vine varieties grown in a certain area and setting the direction of production to maintain the economic sustainability of wine-growing areas). The reaction of the vine to the variation of environmental resources depends on the interaction of several factors: genetic characteristics of the variety, intensity and phenophasis of action of climatic factors, plant preparation, applied technology. The adaptive mechanisms by which the vine responds to the variation of environmental conditions can also be evidenced by the variation of physiological and bioproductive parameters. In this paper are presented research results on the response of 3 grapevine varieties (Cabernet Sauvignon, Merlot, Feteasca neagră) cultivated in Banu Maracine viticultural center to the variation of climatic conditions during 2 years of cultivation.

Key words*: grapevine, physiological parameter, bioproductive parameters, environmental resources.*

ROMANIAN VINEYARD AREAS AND THE EVOLUTION OF WINES WITH TRACEABILITY IN THE PERIOD 2007-2022, USING EUROPEAN RESTRUCTURING/ RECONVERSION FUNDS

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Abstract

This study provides an overview of the substantial changes in the structure of the wine grape assortment in Romania through the use of European funds allocated for vineyards reconversion/restructuring. Between 2007 and 2022, both new international varieties, which previously existed only in ampelographic collections, and old Romanian varieties, which are more adaptable to climate change and are increasingly appreciated by the wine drinking public, were introduced into the Romanian wine assortment. The study presents an update on the evolution of the areas cultivated with the most widespread wine grape varieties destinated for wines with protected designation of origin, protected geographical indication and varietally. On this basis, the quality level of the wines obtained during the 15 years studied was analyzed, based on the assessments made by the specialist tasting committees of the governmental Body which, on the basis of the traceability ensured by the producer, guarantees their origin and authenticity.

Key words*: assortment, PDO, PGI, tasting, winegrapes.*

CABERNET SAUVIGNON VARIETY BEHAVIOURAL ANALYSIS IN ROMANIAN VINEYARDS AREAS UNDER THE CLIMATE CHANGE INFLUENCES

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Abstract

In the European Union, the change of wine grape variety for economic reasons in vineyards established under reconversion/ restructuring programs can be done after at least 10 years of vineyard exploitation. In the context of climate changes modifications in the microclimates of vine-growing areas are increasingly observed. Extreme climatic phenomena, with an impact on the harvest or the lifespan of grapevines, are becoming more and more aggressive, with quantifiable effects in the wine industry as well. We have carried out an analysis, on various aspects, of the behavior of the 'Cabernet Sauvignon' variety in the vine-growing areas of Romania. For comparison, the years 2018 and 2022 were analyzed, in the terms of cultivated areas and produced and marketed wines. Our analysis suggests that in the near future, in Romania, due to climate change, there will be vineyard areas where this variety will either no longer be cultivated, or it will be used only for the production of rosé wines or bulk red wines and oenological modelling according to consumption trends is neither economical nor justified.

Key words*: climatic conditions, grapevines, production, trends, wines.*

EVALUATION OF THE POLYPEHNOL EXTRACTS FROM VINE CANES (*VITIS VINIFERA* L.) OBTAINED BY AN IMPROVED EXTRACTION METHOD

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Abstract

Waste vegetal materials generated during vine pruning are rich in bioactive molecules, especially polyphenols, therefore their valorization received considerable attention in the last years. This work focuses on evaluating the polyphenol composition and antimicrobial activity of vine cane extracts obtained with an improved method using a pre-treatment with cell wall degrading enzymes and fluidized bed extraction. Different quantities of canes (1 to 20 g) were used to obtain several extracts. Total phenolic content (TPC), hydrolysable and condensed tannins, antimicrobial and antioxidant activity (DPPH test) were determined. The extract obtained from 5 g of dry vine cane showed the highest antioxidant activity (85.64±0.22%), a high value of TCP (83.85±4.62 mg GAE/g dw) and a 2.44 times higher antimicrobial activity compared to antibiotic ciprofloxacin on E. coli ATCC 8739. However, the highest gallotannin content (16.26±0.03 mg tannin acid/g dw) was detected in the extract obtained from 20 g of vine canes, while the condensed tannin was low in all samples.

Keywords: *improved extraction method, grapevine cane, polyphenol composition, antioxidant activity, antimicrobials*

THE IMPACT OF COPPER APPLICATION TIMING AND THE FREQUENCY OF TREATMENTS ON PHYSIOLOGICAL, BIOCHEMICAL, AND PRODUCTIVE PARAMETERS IN A VINEYARD

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Abstract

The research carried out between 2021 and 2023 was primarily focused on managing the timing and frequency of copper application-an essential treatment in the control of diseases and pests. The grape varieties (Victoria, Muscat de Hamburg, Merlot, Cabernet Sauvignon, Feteasca neagră) involved in the research were for table grapes and wine, with peculiar tolerance to frost, diseases, and pests. Experimental plots were organized based on several copper treatments correlated with disease and pest management. Several grape yield parameters, as well as berry composition and canes (berry sugar and vitamin content; cane carbohydrate content), were tracked for each of the six experimental plots within each grape variety. Simultaneously, an examination of how the vines survived during the winter as regards of wood maturity and bud viability was carried out, taking into account the major influence of copper on these parameters. The results showed that the grape varieties behaved differently from year to year, depending on the individual qualities of each variety.

Key words*: viticulture, copper, cane maturation, grapes, quality.*

IMPACT OF SUMMER GREEN PRUNING ON THE PHENOLIC CONTENT OF GRAPES FROM SYRAH CULTIVAR

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Abstract

The study was made on the phenolic content of grapes of the Syrah variety when applying bunch thinning and defoliation in the area of the bunches. The study was conducted in a fruiting plantation for a two-year period (2021-2022). The effect of green pruning on the content of total, flavonoid, non-flavonoid phenolic compounds and anthocyanins in the rachis, seeds, skins and berries was monitored. During the study period, the samples from the 2021 harvest were characterized by better anthocyanin content in the skins and berries of the normalized and defoliated variant, and for the 2022 harvest with the normalization variant. In the 2021 harvest, there is a higher content of OFS, FFS and NFS in all variants compared to the variants of the 2022 harvest in the structural elements of rachis, seeds, skins and berries. A positive influence of the applied pruning practices on the phenol content compared to the control variant was found.

Key words*: Syrah, grapes, summer green pruning, phenol content.*

MONITORING OF A VINEYARD BY FLYING OVER WITH A UAV

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Abstract

With the help of constant visual control and spectral during the period 2021-2022, the development of a vineyard was followed, and the dynamics of climatic factors were followed. Monitoring of climatic parameters (air temperature, soil temperature, atmospheric humidity, leaf humidity, sunshine, wind direction, evapotranspiration, rainfall) was carried out throughout the growing season of the vineyard. As a result of the observations and reports, some conclusions were drawn related to the effectiveness of drone monitoring. The BNDVI indices, which range from 0 to 1, were measured, and soil and leaf moisture parameters were recorded throughout the growing season. During the drone survey, the dynamics of the vegetation index of the vine was tracked in the established field experiment. The results of the two-year research on yield and quality of grapes fully correspond and are linked to the influence of climatic factors during the growing season and the dynamics and course of phenophases. A difference was reported between the two years, both in terms of climate and grape and wine quality. Considering the non-uniform site and sloping terrain of the vineyard, it was concluded that remote monitoring data is an excellent tool for control, tracking and forecasting, but when considering a specific local site, professional visual inspection and the application of additional analyzes and performance of measures related to cultivation technology.

Key words: *grapes, monitoring, drone, vegetation index, yield, quality*.

PHYSICO-CHEMICAL COMPOSITION OF DIFFERENT GRAPE VARIETIES FROM PIETROASA VINEYARD

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Abstract

The objective of this study was to evaluate the quality aspects of grapes harvested prior to the commencement of the 2023 winemaking campaign at Pietroasa Winery. Grape samples from eight distinct varieties - Busuioacă de Bohotin, Tămâioasă Românească, Riesling Italian, Alb Aromat, Fetească Regală, Fetească Neagră, Merlot, and Cabernet Sauvignon - were collected during the harvest season at Pietroasa. This paper details the analysis of key quality indicators, including fruit weight, shape index (SI), firmness, total soluble solids (Brix), total titratable acidity (TTA), pH, dry matter content (DM), total polyphenols content (TPC), and antioxidant activity (AA), all of which are critical to assessing wine quality. It synthesizes current research on grape quality, highlighting the significant antioxidant capacity attributed to polyphenol content and suggesting avenues for future research on wine production at Pietroasa Winery. In conclusion, the study reaffirms the suitability of the Pietroasa region for vinification, attributed to its terroir which ensures the production of grapes of high quality, resulting in wines with desirable and distinctive aromatic profiles.

Key words*: quality, grape, wine, polyphenols, antioxidant activity.*

ENHANCING OF BIOAVAILABILITY OF VALUABLE COMPOUNDS FROM GRAPE POMACE BY ENZYMATIC TREATMENT

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Abstract

Grape pomace, the most abundant winemaking by-product, represents a possible source of valuable biocompounds that can be valorised in different domains of industry also providing environmental benefits. The investigation performed provides relevant data on the potential of various enzyme mixtures (β-glucanase, hemicellulases, xilanases, pectinases, proteases) to release monosaccharides, amino acids and polyphenols by grape pomace's hydrolysis, thereby increasing its nutritional and functional properties. The reducing sugars, the aminoacids and the polyphenols obtained were determined, and the antioxidant activity was measured before and after the enzymatic treatments of the grape pomace. The researches performed on two varieties of grape pomace indicated that the white variety was noted with a higher quantity of total soluble sugars, while red grape pomace was found to have higher amounts of amino acids, polyphenols and higher antioxidant activity. The enzymatic treatment of grape pomace enhanced the extraction yield by up to 59% for reducing sugars, respectively 55% for polyphenols.

Key words*: antioxidant activity; enzymatic hydrolysis; glucanases; pectinases; polyphenols*
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BIOLOGICAL ASPECTS AND MANAGEMENT APPROACHES OF THE GRAPEVINE PEST, *PULVINARIA VITIS*, IN THE CLIMATE CHANGE CONTEXT

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Abstract

The aim of this study arises from the emergence of new outbreaks producing damage in vineyards from Transylvania and also from the limited amount of updated literature on Pulvinaria vitis, in Romania. The present paper provides an overview of the biology and control of Pulvinaria vitis in the climate change context, because further research is needed, especially on specific regions where it was identified, in order to understand the full range of impacts and to elaborate effective management strategies. In the last few years, wine growers reported the presence of a sticky black residue on the grapevines and a cottony grape scale, which seems to produce economic losses. Pulvinaria vitis has the ability to cause damage by feeding on phloem sap and excreting honeydew on which sooty mold develops, reducing the plant's capability of respiration, transpiration, and photosynthesis. Additionally, it has been identified as a vector for several grapevine-infecting viruses. Recent climate change appears to be influencing the distribution and life cycle of Pulvinaria vitis and also making the plants more susceptible to pest damage.

Key words*: climate change, vineyard pest, management strategies, Pulvinaria vitis.*

INFLUENCE OF HIGH-POWER ULTRASOUND TREATMENT ON RED WINE QUALITY PARAMETERS

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Abstract

The objective of this study was to assess the impact of applying high-power ultrasonic treatment (HPU) on crushed Merlot grapes, at a laboratory scale, on the phenolic matrix of red wines, particularly anthocyanins, which are crucial for color, stability, and sensory profile. The ultrasonic treatment (US) was carried out using two amplitudes, 70% and 90%, and three treatment times, namely, 3, 4, and 5 minutes, while maceration was conducted via sequential extraction after 3, 5, and 7 days. After a bottling period of three months, there was a decrease in total polyphenol content observed compared to the content found at the end of maceration. Treatment with ultrasound caused significant variations in the optical density at 420, 520, and 620 nm, and in the content of monomeric anthocyanins. All the sonicated samples, including those extracted after three days of maceration, exhibited significantly higher color intensity values than the maximum color intensity value in the untreated samples. It is noteworthy that the change in color was a positive outcome of this treatment. The Random Forest algorithm was used to identify the most distinct variables among wines. The most significant variable was found to be the total polyphenol content, followed by antioxidant capacity and the color intensity of the wines. The algorithm grouped all the samples into 5 clusters based on three fixed factors that influenced their characteristics: amplitude, treatment time, and maceration duration. Based on these results, it can be inferred that the effects of ultrasound treatment vary significantly depending on the parameters used.

Key words*: high-power ultrasound treatment, red wines, bioactive compounds, chromatic characteristics.*

PERFORMANCES EVALUATION OF SOME WINE GRAPE CULTIVARS GROWN IN NORTH-WEST OF ROMANIA

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Abstract

The historic vineyards of Satu Mare County, mentioned since feudal times, were the focus of research in the Bogdand village area from 2021 to 2022. Various wine grape cultivars including 'Fetească regală', 'Sauvignon Blanc', 'Italian Riesling', 'Traminer rose', 'Muscat Ottonel', 'Tămâioasă românească', 'Pinot noir', 'Burgund mare', 'Cabernet Sauvignon', and 'Merlot' were studied. The research encompassed cultivation techniques, soil tillage frequency, pest and disease treatments, and quantitative and qualitative production analyses, including organoleptic evaluations. Despite challenges like droughts and heavy rainfall in 2022, meticulous management yielded balanced sugar-to-acidity ratios and high-quality grapes, notably in the 'Cabernet Sauvignon' and 'Traminer rose' varieties. Recommendations from an initial agrochemical study were implemented in subsequent years to address reported issues. Climatic variations influenced technological applications. National programs aimed at revitalizing Romanian viticulture through European funds have proven successful. The unique terroir and local culinary tradition elevate the profile of these wines, labeled "I.G. Hills of Sătmarului."

Key words: *grape varieties, Satu Mare County, vineyards, wines*

TRAINING TYPE, CROP LOAD AND SHADING EFFECT ON QUALITY COMPONENTS OF ITALIAN RIESLING GRAPE VARIETY

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Abstract

The study investigated the influence of crop load and grape berry exposure on the characteristics of Italian Riesling grapes from the Recaș vineyard, Timiș County, Romania. The research focused on vines managed under the Guyot training system, utilizing both single and double cordons, arranged in north-south rows. Evaluation of grape exposure encompassed strategies such as: complete (100%) and partial (50%) leaf thinning around the bunches. Sixteen distinct plots were established, organized into four blocks, to examine various management practices and thinning techniques. Vine vigor was assessed through measurements of pruning and leaf area, with harvesting schedules adjusted to achieve similar °Brix values across plots. Following berry sampling and processing, grape juice analysis was conducted, revealing that vines trained double Guyot generally exhibited superior grape yield. However, higher crop loads were associated with reduced leaf area, resulting in delayed veraison and impacting sugar accumulation. Crop load had a significant influence on grape berry juice acidity and pH level, depending also of training system. Overall, the findings underscored the importance of the leaf surface-to-grape yield ratio as a critical determinant of grape yield and juice quality.

Key words*: Italian Riesling, Guyot training, leaf area, crop load, Brix.*

RESEARCH CONCERNING THE UTILISATION OF THE UNDERGROUND DRIP IRRIGATION IN ORDER TO CONTROL THE WATER STRESS OF GRAPEVINE

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Abstract

The research was carried out in the period 2019-2023 in an experimental polygon with Chardonnay and Sauvignon varieties, in the conditions of a reddish-brown molic soil and Feteasca regala variety under the conditions of an anthrosol hortic, argic, vertic. According to the level of the rainfalls that induced a certain level of soil humidity, four water supplies were yearly applied, the irrigation amount ranging in between the limits of 1100-2225 cubic meters/ha. Therefore, during the whole green period, the irigated variants were supplied with a water reserve in the soil exceeding the minimal threshold by 50% of the Useful water capacity (UC). The results obtained evidenced the positive influence of irrigation both upon the grape yield and its quality. Increased yields of grapes were obtained in comparison with the not irrigated witness control, averagely ranging in between the limits of 12-64%, on the background of a better accumulation of sugars in grapes. Under severe conditions of water stress, the application of irrigation proves to be compulsory, in certain years even after the beginning of the grape ripening stage.

Key words*: water stress, pedological drought, Active Humidity Index.*

CLIMATE CHANGE TREND AND EFFECTS ON VINE CULTIVATION IN DEALU MARE VINEYARD

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Abstract

The measurement and quantification of climate variability was carried out on the basis of the 27 climate indices (16 indices based on temperature and 11 precipitation indices) defined by the Climate Change Detection and Indices (ETCCDI), which mainly focus on both cold and hot extremes of daily minimum temperature (TN), maximum daily temperature (TX), precipitation (PR) and, also percentile-based thresholds. Compared to climatology 1990-2009, in 2010-2022 the frequency of cold nights decreases and the frequency of warm nights increases. Percentile-based indices measuring the frequency of "cold days" (TX10p) has decreased and "warm days" (TX90p) has increased. The fixed maximum temperature events, freezing days (TX < 0°C) and summer days (TX > 25°C), show decreasing and increasing trends, respectively by 22 days (2.09 days/year), (in line with the general warming trend), but these are generally statistically significant. The effects of climate change are manifested on the development of vegetative phenophases (budding, flowering, leaf, grape ripening) and the evolution of grape production and its quality.

Key words*: ETCCDI indices, freezing days, summer days, vegetative phenophases.*

EFFECT OF BUNCH THINNING ON THE GRAPES QUALITY IN CLONES 174 AND 470 FROM SYRAH VARIETY

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Abstract

The experiment was conducted in the experimental vineyard of the Agricultural University - Plovdiv, during the period 2020-2022. Two clones of the Syrah variety numbered 174 and 470 grafted onto the SO4 rootstock were used. The green pruning operation `bunch thinning` was applied, performed manually in the `pea size` phase. Differences were found in the bunch structure according to the indicators - normal berries (%), bunches (%), milleranded berries (%), raisined berries (%), theoretical yield (%), average bunch mass (g) and average cluster size (cm). The mechanical analysis was obtained from skins (%), seeds (%), mesocarp (%), average weight of 100 berries (g), number of seeds in 100 berries, average seeds weight in 100 berries (g), average berry size (mm). The grape ripening dynamics was monitored, through the quantitative change in the sugar content (%) and titratable acids (g/l). The application of bunch thinning, as a widely known viticultural practice, part of the Canopy management complex of activities involved in, has had a positive impact on accelerating the grapes ripening and increasing its quality in the studied clones.

Key words*: bunch thinning, clones, mechanical analysis, Syrah variety, technological maturity*

PRELIMINARY RESEARCH ON THE GRAFTING AFFINITY OF SOME NEW GRAPEVINE CULTIVARS CREATED AT RDSVO ODOBESTI ON DROUGHT-RESISTANT ROOTSTOKCS

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Abstract

The global warming of the climate, a phenomenon that has significantly characterized the last decades, has considerably influenced the evolution of the thermal and water regime annually and during the growing season in the viticultural ecosystem of the Odobeşti vineyard, the atmospheric and pedological drought characterizing the last four years of viticulture. In this context, the use of drought-resistant rootstocks for grafting is one of the solutions to counteract this extreme phenomenon that is increasingly present in the wine-growing areas of southern Moldova. In the present paper, preliminary results are presented regarding the grafting affinity of three new vine varieties created at RDSVO Odobeşti ('Putna', 'Măgura' and 'Vrancea'), on three rootstocks with drought tolerance obtained by Romanian viticultural research ('Drăgăşani 70 M.', 'Crăciunel 71 Bl.', 'Ruggeri 140 Vl.'). For comparison, the rootstock 'Berlandieri x Riparia Sel.Oppenheim 4-4 Bl.' was used, with the widest use for grafting in the Odobeşti wine-growing area. The preliminary results obtained show a good and very good grafting affinity on 'Ruggeri 140 Vl.' rootstock. for all three varieties studied.

Key words*: rootstock, grafting affinity, drought.*

CHALLENGES CAUSED BY CLIMATE CHANGE IN ORGANIC GRAPE PRODUCTION IN THE SOUTHWESTERN WINE-GROWING REGION

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Abstract

In recent years, the adverse effects of climate change on agricultural productivity have been increased drastically. As a result of this change, in the Southwestern wine-growing region, which has a transitional Mediterranean climate, the possibilities for organic grape production are hampered. Productivity and profitability decrease due to uncontrollable events caused by climatic anomalies. Rainfalls of 119 mm, and 218.2 mm, per m^2 were recorded during the study period. These rainfalls accumulated during the autumn-winter period in combination with the low temperatures of the atmosphere and the soil create prerequisites for stopping rhizogenesis and suction activity of the root system in the spring, and this reflects on the growth processes of the vines. All this has a direct impact on the accumulation of biomass, which has a direct impact on the duration of the growing season. These components lead to significant changes in the intensity of growth processes in the vine. From here follows the formation of yields with inappropriate technological quality.

Key words: *Climate, Organic viticulture, Phenology, Shiroka Melnishka loza*

THE LOCAL GRAPEVINE VARIETIES - A SOURCE OF TYPICITY, AUTHENTICITY, AND ADAPTABILITY, WITHIN THE FRAMEWORK OF SUSTAINABLE VITICULTURAL TECHNOLOGIES

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Abstract

The research was carried out over the 2020-2022 growing seasons and focused on specific local grape cultivars discovered in 2019 in the gardens or vineyards of amateur winegrowers in Alba County. Among these, 12 little-known or unknown local cultivars were studied, grouped based on grape quality and yield, and compared to well-known reference types widely distributed in the area. The local white wines were compared to the control 'Fetească regală', the red wine cultivars to 'Cabernet Sauvignon', and the fresh consumption cultivars to 'Chasselas dore'. The aim was to identifying the growth stages of local cultivars and identifies those that bud or bloom later, in order to mitigate risks associated with increasingly frequent climate variability. Additionally, the research focused on the main ampelographic characteristics, grape production quantity and quality, as well as disease and pest resistance, important indicators in the current context emphasizing cost and pollution reduction, and the production of healthier viticultural products. Most of the analysed cultivars displayed higher resilience against diseases and pests when compared to the control cultivars.

Key words*: adaptability, grapevine, local cultivars, technology, typicity*

STUDIES ON THE CONTENT OF VOLATILE AROMATIC COMPOUNDS AND UNDESIRABLE COMPOUNDS IN VARIOUS FRUIT-DISTILLED BEVERAGES

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Abstract

In Romania, along with țuica (distilled from plums), distilled beverages from several fruit species (apricots, peaches) are obtained through traditional distillation in copper stills. In most cases, the producer will use fruit that still retains its stone during the fermentation process. This results in important contributions to the overall flavor complexity in distilled beverages. Drinks distilled from plums, apricots, peaches are characterized by an intense `fruity` aroma, specific to the raw material used. In addition to these compounds that form the specific flavor, these distilled beverages may also contain some harmful, undesirable compounds. To investigate the behavior of volatile compounds during a traditional still distillation, a large number of important volatile compounds were identified and quantified by GC/MS analysis in different fractions (Head, Heart and Tail) of fruit distillates obtained from three species: plums, apricots and peaches. In this study, the concentration of methanol and hydrocyanic acid (HCN) which are toxic and acetaldehyde and furfural which are harmful only if present in higher concentration were also determined.

Key words*: Distillated beverages, aromatic compound, acetaldehyde, methanol, furfural, hydrocyanic acid, distillation cuts.*

STUDY ON THE QUALITATIVE PROFILE OF SOME SEEDLESS VINE VARIETIES IN A TEMPERATE CLIMAT

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Abstract

In grapevine varieties - the lack of seeds seen from the perspective of two phenomena parthenocarpy and stenospermocarpy - has a major impact on the consumer, representing an important added economic value, currently being one of the most appreciated features of table grape varieties. In the present work, four varieties of grapes intended for fresh consumption but also for raisins were studied – 'Sultanina' (Thompson seedlles), 'Sublima', 'Supernova' and 'Călina'. The obtained results showed that the productive and qualitative performances obtained, expressed by the values of the productive indices and the organoleptic qualities (brix, glucose, fructose, acidity, gluco-acidometric index), both in the fresh product and in the raisins, correspond to the quality standards. The surprising fact is that these varieties ensure a double use - firstly as table grapes for fresh consumption and secondarily as raw material for obtaining raisins (artificial dehydration at a temperature of 50^0C).

Key words: *grape, raisins, temperature, varieties, yield.*

THE ASSESSMENT OF PURITY AND TYPOLOGY OF THE 'PINOT GRIS' CULTIVAR, CULTIVATED IN THE MURFATLAR WINE-GROWING CENTER, THROUGH SYSTEMS BASED ON AMPELOMETRY

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Abstract

A study on ten 'Pinot Gris' cultivar elites was carried on at the Research Station for Viticulture and Enology Murfatlar during the 2021-2022 wine year aimed to authenticate plantation specimens. Ten elites (H1-H10), each with similar growth force, had ten leaves harvested during veraison from the middle part of the shoot. Using a planimeter with 0.1 mm precision, leaf vein length and main angle size were measured. These elites were compared to a control vine from the base plantation. Analysis showed H4, H8, H6, and H9 could be new biotypes for further agrobiological study. H1, H3, and H7 did not differ from the control, suitable for multiplication and maintaining cultivar authenticity. The variation coefficient remained below 30%, ensuring homogeneity and representativeness in the study.

Key words*: ampelometry, typicity, clonal elites, grapevine.*

VEGETABLE GROWING

A BRIEF DESCRIPTION OF CULTIVATED CHILLI PEPPERS

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Abstract

Chili peppers is an important vegetable and spice crop grown all over the world for fresh, dried, and processing products. Capsicum spp. is a member of the Solanaceae family and native to the temperate, subtropical and tropical regions of the Americas. This research paper provides a comprehensive overview of the distinctive descriptors of the Capsicum genus, showcasing images sourced from the germplasm collection at the Vegetable Research Development Station (VRDS) Buzau, Romania. The paper focuses on morphological features as the key basis for differentiation among the domesticated Capsicum species: C. annuum L., C. chinense Jacq., C. frutescens L., C. baccatum L. și C. pubescens Ruiz & Pav. Various descriptors, such as flower and fruit shapes, corolla color, corolla sport color, the presence or absence of calyx annular constriction, and seed colour, are employed to provide a nuanced understanding of the unique characteristics of each species. By elucidating these morphological features, the paper aims to empower readers to easily distinguish between different Capsicum varieties.

Key words*: biodiversity, Capsicum spp., morphological features, Solanaceae.*

THE INFLUENCE OF CULTIVAR AND ORGANIC FERTILIZATIONS ON PLANT GROWTH, PRODUCTION AND QUALITY OF SWISS CHARD, IN WESTERN ROMANIA

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Abstract

Swiss chard (Beta vulgaris L., ssp. cicla) are grown for whole leaves or only for petiole. In Romania, chard is a less cultivated species, being present in some areas of Transylvania. Research aim was to establish how some Swiss chard cultivars behave, after fertilization with three different organic fertilizers. Plant growth, total production as well as dry matter, phenols, flavonoids, dietary fiber, carbohydrates and vitamin C content was measured. Experiment took place between 2021-2022, in an organic vegetable farm, in Săcueni, Bihor county, Romania. Three organic fertilizers were used: Lignohumate, Alcygol Z2M and Alg Green, applied 30 days after emergence, at the dose recommended by the manufacturer. Plant development, 60 days after emergence, was higher at Lucullus cultivar, fertilized with Alg Green, 54.35 cm. Production ranged from 44.67 t/ha (Carde Blanche d'Ampuis fertilized with Lignohumate) to 51.04 t/ha (Lucullus fertilized with Alg Green). Plant content in dry matter, fibers and vitamin C, was higher when plants were fertilized with Lignohumate. Phenols and flavonoids were higher at variants fertlized with Alg Green.

Key words*: chemical composition, organic fertlizers, plant development, swiss chard.*

ENHANCING *PHYSALIS IXOCARPA* L. CROP YIELD QUANTITY AND QUALITY USING BIOCHAR, WOOD VINEGAR AND CROPMAX: A SUSTAINABLE APPROACH

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Abstract

Physalis ixocarpa L., commonly known as tomatillo or Mexican husk tomato, is an economically valuable crop due to its nutritional value and culinary versatility. However, its growth and yield can be affected by various factors including soil quality, nutrient availability, and environmental stressors. In this study, we investigated the effects of employing biochar, wood vinegar, and CropMax - a proprietary organic fertilizer - on the growth, yield, and some quality parameters of Physalis ixocarpa L. Results demonstrated that the combined application of biochar, wood vinegar, and CropMax significantly improved the growth characteristics of Physalis ixocarpa L. The treatments applied positively influenced both quantitative and qualitative yield parameters compared to control variant. This study highlights the potential of employing biochar, wood vinegar, and CropMax as a sustainable approach to enhance the growth, yield, and soil health of Physalis ixocarpa. The findings underscore the importance of integrated management strategies for sustainable agriculture practices, emphasizing the potential for improving crop productivity while maintaining soil health and fertility

Key words*: tomatillo; pyrolized biomass; pyroligneous acid; eco-friendly produces; crop enhancer.*

PRELIMINARY STUDIES ON THE INFLUENCE OF DIFFERENT SUBSTRATES ON THE CULTIVATION OF PEPPERS (*CAPSICUM ANNUUM* L.)

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Abstract

The paper presents a summary of scientific and technical findings on the influence of different substrate types used in pepper crops in protected environments. Pepper cultivation has developed a lot over time, due to different factors, so that different possibilities of cultivation have emerged, in the field, in greenhouses, in seedlings, on natural or artificial substrate, in hydroponic systems. The substrate must meet certain requirements: it must have a suitable structure, ensure gas exchange with the atmosphere and be permeable to water and air, and be rich in nutrients. In particular, the paper refers to the use of organic substrate to improve the quality and quantity of pepper fruits. According to the literature cited, the use of organic substrate offers numerous advantages including better control of nutrition and irrigation, adequate aeration and drainage and better conditions for root system development. The aim is to obtain an earlier and higher yield by adapting the pepper cultivation technology in a limited space, by using certain doses and types of fertilizers leading to the optimization of nutrients.

Key words*: organic substrat, cultivation tecnology, higher yield, protected environments.*

EFFECT OF BIOSTIMULANT TREATMENT ON THE ANTIOXIDANT ACTIVITY IN TOMATO FRUIT

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Abstract

One of the most widely grown and consumed vegetable, tomato (Lycopersicon esculentum Mill.) is valuable both for their rich taste and for their nutritional value and antioxidant properties. Vitamin C, carotenoids (lycopene, β-carotene) and polyphenols are the main bioactive compounds present in tomato, their regular consumption being correlated with a low risk of various cancers and some cardiovascular diseases. Biostimulants products represent nowadays a sustainable alternative to the chemical fertilizers used for improving crop yields and quality. A product obtained from fish gelatin and collagen hydrolysate was physicochemically characterized and used for foliar application on tomato crop in the fruiting stage. The objective of this study was to assess the effect of the biostimulant treatment on antioxidant activity of tomatoes. The tomatoes were analyzed regarding carotenoids, ascorbic acid, phenolic compounds content and antioxidant activity. The treated tomatoes presented higher content by 26.64% for lycopene, by 12.8% for ascorbic acid and by 17.25% for total phenolics. These positive effects can be attributed to the supplementary amino acids amount provided by the biostimulator product.

Key words*: antioxidant activity, ascorbic acid, fish gelatin, lycopene, phenolic compounds.*

CHALLENGING THE UNBEATABLE: *HELICOVERPA ARMIGERA* INFESTATION IN *MOMORDICA CHARANTIA* - A NOVEL CASE STUDY

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Abstract

Momordica charantia, commonly known as bitter gourd or bitter lemon, belongs to the Cucurbitaceae family and is a versatile herb cultivated in various tropical and subtropical regions. Despite its distinctive appearance and bitter taste, it stands out as one of the most nutritious gourds. Numerous studies have highlighted its antimicrobial properties against soilborne pathogens and inhibitory effects on human pathogens. Additionally, the plant contains compounds known to repel insect pests. In Romania, M. charantia has been successfully acclimatized at the Vegetable Research and Development Station in Buzău, leading to the development of two cultivars: Rodeo and Brâncuși. Over a span of fifteen years, this plant has demonstrated resilience, remaining free from diseases and pests that could compromise its yield. However, during the vegetation period of 2023, a notable exception occurred as researchers identified an infestation of Helicoverpa armigera in the fruit crop. Intriguingly, this pest has not been previously reported in association with bitter gourd worldwide. The existing literature does contain studies on the inhibitory effects of M. charantia compounds against H. armigera, but this case study demands further investigation.

Key words*: bitter gourd, cotton bollworm, Cucurbitaceae.*

ELEMENTS OF PRODUCTIVITY IN TOMATO PLANTS IN RELATION TO FOLIAR FERTILIZATION

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Abstract

The study evaluated productivity elements in tomato plants in relation to foliar fertilization. 'Beldine F1', 'Sandoline F1', 'Ciciu F1' and 'Izmir F1' tomato hybrids were grown. Foliar fertilization was done with the Bionat product. In relation to the specifics of each hybrid and the applied fertilization, the variation of some physiological and productivity parameters was recorded: plants height, Ph=179.80-203.60 ± 2.73 cm; inflorescence number, In=7.50- 8.50 ± 0.12; flower number, Fn = 5.20-6.70 ± 0.17; fecundated flower, Ff = 4.60-6.20 ± 0.20; fruit number in bunches, Fnb = 4.60-6.20 ± 0.20; average bunch weight, Abw = 0.53-0.90 ± 0.05 kg; fruits number on plant, Fnp = 35.50-50.80 ± 2.12; average fruit weight, Afw = 0.12-0.16 ± 0.01 kg; average plant production, App = 4.17-7.33 ± 0.42 kg. Based on the coefficient of variation, high variability was recorded in the case of the App parameter (CV = 20.79140) and low variability in the case of the Ph parameter (CV = 3.95331). According to PCA, the distribution diagrams of variants were generated in relation to flowering parameters (PC1 explained 80.696% of variance, and PC2 explained 18.566% of variance) and in relation to fruiting parameters (PC1 explained 83.685% of variance, and PC2 explained 15.523% of variance).

Key words: *fecundated flowers, inflorescence number, multicriteria analysis, Pearson's correlation, prediction models.*

IMPACT OF URBAN CONDITION ON BRASSICACEAE DEVELOPMENT

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Abstract

Urban agriculture refers to the practice of cultivating plants within city environments. It faces challenges such as accessing resources, soil, water, and air quality in urban environment. Field experiments were carried out in 2023 on alluvial-meadow soil located in Sofia city, focusing on growing cabbage and kohlrabi. Biometric analysis, absolute dry matter, and crop yields were conducted for both crops. Soil analyses were performed at the beginning of the experiment. The soil showed weak humus content, ranging 1.5% to 1.82%. The data obtained for kohlrabi yields and total available water, along with the correlation coefficient R2-0.77, indicate that an increase in irrigation rate results in decreased yield. Yields obtained in urban conditions ranged between 14-15 t/ha for kohlrabi and 34-47 t/ha for cabbage.

Key words*: urban agriculture, drip irrigation, yield, soil condition.*

ASSESSMENT OF GENETIC DIVERSITY OF COMMON BEAN (*PHASEOLUS VULGARIS* L.) GERMPLASM RESOURCES, USING MORPHOLOGICAL CHARACTERIZATION

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Abstract

Common bean (Phaseolus vulgaris) is an important crop in Romania. The analyse of genetic diversity of common bean populations is useful tool in breeding programs, as it helps to select genetic material to be valorized for further crossing. Twenty-five common bean accessions were analyzed using qualitative morphological traits, as follows: hypocotyl pigmentation (HP), color of flowers (CF), color of wings (CW), growth habit (GH), leaf shape (LS), podding habit (PHA), pod color (PC), plant height (PH), number of the primary branches (NB), number of pods per plant (NP), shape of the pod (SP), pod color (PC), pod length (PL), pod width (PW), number of seeds per pod (NSP), seed shape (SS), seed coat color (SCC), seed length (SL), seed width (SW), hundred-seed weight (HSW), and length/width of the seed (LWS) were recorded at harvest. The average diversity based on investigations of qualitative morphological traits revealed that qualitative morphological markers are efficient in assigning modern cultivars to their gene pools of origin.

Key words*: legumes, biodiversity, phenology, traits.*

ASSESSMENT THE EFFECT OF GENOTYPE X MYCORRHIZA INTERACTION ON SOME FRUIT QUALITY TRAITS IN TOMATO

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Abstract

In the context of current concerns regarding sustainable tomato production, the use of arbuscular mycorrhizal fungi (AMF) can represent an important way in order to reduce the use of chemical fertilizers and pesticides and their negative environmental impact. The aim of this study was to assess the qualitative traits of fruits (firmness, titratable acidity, total soluble solids, maturity index, and flavour index) in six tomato genotypes under the effect of mycorrization with Glomus sp. The biological material was composed by five hybrids and one tomato variety developed at ULS Timișoara. The study was carried out using a split-plot design with mycorrhizal treatment as the main factor. The effect of AMF on different quality traits was influenced by the genotype, to a greater extent for fruit firmness and acidity, and associated with an increase of sugar content and firmness of fruits. The obtained results highlighted that the use of AMF in tomato can lead to an improvement in fruit quality, considering that a selection of appropriate genotypes is also necessary.

Key words*: Solanum lycopersicum, arbuscular mycorrhizal fungi, fruit quality.*

ANALYSES OF MORPHOLOGICAL DYNAMICS INTO THE VEGETATIVE PHASE OF WHITE CABBAGE (*B. OLERACEA* VAR. *CAPITATA* F. *ALBA*) ACROSS DIVERSE PLANTING SCHEDULES

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Abstract

Cabbage (Brassica oleracea var. capitata f. alba) stands as an economically significant vegetable crop cultivated on a global scale. The life cycle encompasses four distinct vegetative stages: seedling, rosette, folding, and heading. Rosette leaves, contribute substantially to the energy allocation necessary for the development of the characteristic leafy head. This study delves, firstly, into a detailed morphological analysis to investigate the early developmental stages of cabbage seedlings, unravelling the intricate dynamics of their overall morphology. Secondly, an exploration was carried out into the quantities of assimilatory pigments within the cabbage seedlings which provides valuable aspects of early cabbage development. The third study delves into the influence of planting dates and densities on the morphological characteristics of cabbage plants during the vegetative phase. Through analyses of plant morphology, the study discerns nuanced developmental responses influenced by varied planting schedules. This research aims to contribute not only to the scientific understanding of white cabbage cultivation but also to practical implications for optimizing planting strategies.

Key words*: seedlings, carotenoid pigments, planting strategies, Brassicaceae, heading stage.*

QUALITATIVE AND AGROPRODUCTIVE RESULTS REGARDING SUCCESSIVE CROP OF SWEET PEPPER IN PROTECTED SPACES

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Abstract

Sweet peppers are among the most appreciated vegetable species, renowned for their important nutrients and organoleptic properties. Although their cultivation is mainly carried out in the main crop, for the present study, the sweet peppers were established in a tunnel, in a successive system of culture, after the early cabbage. The aim of this study was to evaluate the influence of the fertilization regime and the cultivar on biochemical and agroproductive characteristics of three sweet pepper hybrids grown in tunnel in a successive system. The experimental protocol consisted in the organization of a bifactorial experience, placed in subdivided plots, with three repetitions: Factor A – Sweet pepper hybrid (a1 - Reno F1; a2 - Traian F1; a3 - Bihar F1) and Factor B – Fertilization regime (b1 - unfertilized; b2 - organic fertilization; b3 - chemical fertilization). Results showed significant influence of the fertilization regime on yields, the best quantitative values being obtained following chemical fertilization (1.52 kg/plant). Conversely, the highest vitamin C content (127.40 mg/100 g product) was observed with organic fertilization.

Key words*: sweet pepper, hybrid, fertilization, yield, protected spaces.*

ASSESSING THE ALLELOPATHIC POTENTIAL OF VARIOUS SPECIES FOR WEED CONTROL IN ORGANIC FARMING ON A CLIMBING BEAN CROP

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Abstract

The aim of the research was to assess the allelopathic potential of certain species for weed control in climbing bean crop. Field trials were carried out to examine the allelopathic impacts of the following allelopathic species: white clover (Trifolium repens), red clover (Trifolium pratense), sainfoin (Onobrychis viciifolia), oil radish (Raphanus sativus var. oleiformis), yellow mustard (Sinapis alba), oats (Avena sativa), barley (Hordeum vulgare), two-rowed barley (Hordeum distichon) and Japanese grass (Lolium perene, Festuca rubra and Poa pratensis). These species were sown with "Auria Bacăului" climbing bean (Phaseolus vulgaris) on intercropping system. It has been observed that main weed species identified in climbing bean crop were: red-root amaranth (Amaranthus retroflexus), cockspur (Echinochloa crus-galli), Canada thistle (Cirsium arvense), perennial sow thistle (Sonchus arvensis), pale knotweed (Persicaria lapathifolia), groundsel (Senecio vulgaris), bindweed (Convolvulus arvensis), guasca (Galinsoga parviflora), flower-of-an-hour (Hibiscus trionum) and petty spurge (Euphorbia peplus). In conclusion, intercropping beans with allelopathic species such as red clover, yellow mustard, and oil radish, along with red clover, oats, sainfoin, two-rowed barley and barley, resulted in a substantial diminishment in weed infestation.

Key words*: ecological agriculture, biological phenomenon, weed infestation, intercropping system.*

REVIEW ON THE IMPACT OF CULTIVATION CONDITIONS ON THE GROWTH AND DEVELOPMENT OF MALABAR SPINACH (*BASELLA* SP.) IN ROMANIA

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Abstract

Basella sp., known as Malabar spinach, Ceylon spinach, Indian spinach, climber spinach and vine spinach, is a green leafy vegetable that grows in the tropical zones across the globe. This specimen manifests commendable resilience to high temperatures, thriving as a fast-growing perennial vine. It is extensively cultivated as a cool-season vegetable. Basella sp. plant serves as a substitute for authentic spinach (Spinacea oleracea L.) and holds considerable economic and medicinal significance. Various studies have substantiated the plant`s richness in vitamin A and vitamin C, accompanied by the presence of amino acids, organic acids, flavonoids, saponins and carotenoids. The objective of this paper is to present a comprehensive depiction of the main outcomes attained in diverse studies concerning the cultivation of Basella sp. in non-conventional systems, with the ultimate aim of garnering optimal results in the cultivation of this species.

Key words*: Basella sp., substrate, conventional, NFT systems.*

STUDY ON THE EFFECTIVENESS OF SOME INSECTO-FUNGICIDE COMBINATIONS IN THE CONTROL OF PATHOGENS AND PESTS IN SWEET POTATO CROP IN THE FIELD

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Abstract

In the conditions of the sandy soils of Dăbuleni, in the period 2020-2022, the aim was to identify some combinations of active substances, to test their effect in preventing and combating pathogens and pests reported during the vegetation period in the sweet potato crop, but also to establish the effectiveness of the application of these products. The best control over the attack of the harmful organisms taken in the study was ensured by the variants in which the Cabrio top and Ortiva 250 SC fungicides were applied in complex with the Mospilan 20 SG insecticides. The combinations of products used in the experimental variants had different effectiveness in terms of the control of harmful organisms that appeared during the vegetation period in the sweet potato crop, depending on the year of the study. Thus, in the variants in which the Ortiva 250 SC product was used in combination, the effectiveness in combating the pathogen Alternaria spp. had values between 82.0% and 89.5%, and in combating the pathogen Botrytis cinerea the effectiveness was between 74.7% and 88.0%.

Key words*: sweet potato, treatment, fungal diseases, effectiveness, pest control.*

DETERMINATION OF THE NUTRITIONAL COMPOSITION OF CARROT POMACE

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Abstract

Carrot (Daucus carota L.) is one of the most important root vegetables cultivated worldwide, due to its nutritional valueand the phytochemicals content which promotes health. Carrot root is a rich source of carotene, carbohydrates, fiber, minerals, vitamins and other biologically active compounds. The processing of carrot root involves the production of waste such as carrot pomace, which can represent a good source of important nutritional and bioactive compounds. The objective of this work was to evaluate the nutritional content of carrot pomace resulting as a by-product of obtaining carrot juice from carrots sold in local agro-food markets. The results obtained showed that the analyzed dried pomace carrot contains important amounts of nutritional compounds that vary depending on the origin of the carrot: 49.02-53.16% carbohydrates, 25.61-31.88% fiber, 5.48-6.95% minerals (ash), 6.32-7.34% protein, 0.88-1.36% fat. The highest fiber potential was recorded in the case of samples from the batch cultivated in Dudestii Noi, while carrot samples grown in Timișoara recorded the highest intake in proteins, lipids, minerals and carbohydrates. The values of the nutritional parameters suggest the use of dried pomace carrot to obtain products with added nutritional value. The superior use of carrot pomace, as a secondary product, can be an ecological way of limiting the waste resulting from the processing of carrot roots.

Key words*: carrot pomace, nutritional parameters, carrot roots, by-product valorization, waste.*

RESISTANCE OF LOCAL GENOTYPES AND MODERN TOMATO CULTIVARS TO ROOT–KNOT NEMATODES *(MELOIDOGYNE* SPP.)

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Abstract

Tomato is one of the main vegetable crops, widely viewed and in demand both in our country and around the world. The aim of the research was to make a primary assessment of the specific reaction of resistance or susceptibility of modern Bulgarian tomato cultivars and old local genotypes to infection with root–knot nematodes. Three cultivars of Bulgarian tomatoes were selected: 'Large red', 'Large pink' and 'Fantasy', which are relatively new and are widely distributed and in high demand on the market, and local genotypes from the Sofia villages of Grigorevo and Negovan - 2 pink and 1 red: genotype G1 /pink tomato/, genotype G2 /red tomato/, genotype H1 /large pink tomato/. The cultivar Moneymaker was grown and compared with the above as a standard cultivar for its response to infection with Meloidogyne spp. The results of the biometric indicators of the studied cultivars and genotypes showed significant differences. The values between the infected and uninfected plants were statistically proven in the 'Large red' and 'Large pink' cultivars, and in the 'Large pink', a significant delay in development was reported.

Key words*: resistance, root–knot nematodes, tomatoes.*

EFFECT OF APPLICATION OF BIOSTIMULANT PROTIFERT LN 6.5 ON THE EPIPHYTIC AND RHIZOSPHERE BACTERIA OF PEPPER SEEDLINGS

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Abstract

The study estimated the effect of biostimulant Protifert LN 6.5, with either foliar or soil treatment at three different doses - 1%, 2%, and 3% on the epiphytic and rhizosphere microflora of pepper seedlings of two varieties - Kurtovska kapia 1619 (KK) and Bulgarski rotund (BR). Irrespectively of the type of treatment, the higher number of epiphytic and rhizosphere bacteria was observed when the biostimulant was applied at dose of 2% but the effect was dependent on the pepper variety. Analysis showed that the type of treatment significantly affected only the microflora in the area of application. The doses of 1% and 3% did not affect the number of bacteria and in general, the estimated values was lower than those for control plants. The beneficial effect of biostimulants based on amino acids is related to improvement of nutrients absorption and the mineralization of organic matter which can increase soil microorganisms abundance. Further research can focus on mechanism of action of biostimulants and their specific effects on plant growth and productivity and on microflora.

Key words*: biostimulant, epiphytic, pepper, rhizosphere microflora.*

STUDY REGARDING THE INFLUENCE OF SOME TECHNOLOGICAL FACTORS ON THE QUALITY OF SWEET POTATO PLANTING MATERIAL

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Abstract

The preliminary study was conducted at the University of Agronomic Sciences and Veterinary Medicine of Bucharest, Faculty of Horticulture, on various sweet potato varieties obtained at the SCDL Dăbuleni, Romania. The sweet potato tubers were rooted in different types of substrates, in various combinations (100% peat, 100% perlite; 25% peat+75%perlite; 50% peat + 50% perlite; 75% peat + 25% perlite), with the aim of obtaining shoots necessary for establishing the crop. Observations were made regarding the growth of the obtained seedlings and the rooting time. The root volume and root mass were determined, and correlations were made regarding the influence of the type of substrate and the fertilizers used.

Key words*: sweet potatoes, peat, perlite, transplants, quality.*

THE INFLUENCE OF BENEFICIAL BACTERIA ON SOIL AND TOMATO ROOTS

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Abstract

The soil is one of the most important resources of mankind, being the physical support as well as providing the supply of nutrients that plants need to grow and bear fruit. It is well known from specialized research that the application of products based on microorganisms can improve the physical and chemical qualities of the soil and also the productivity of culture. The present study examined the efficacy of two products Rizobac and Bactilis on 3 tomato hybrids Kingset (red fruit), Bucanero (black fruit), Buffalosun (yellow fruit) grown in protected spaces (plastic tunnels), in the Scărișoara district of county Olt. The experiment took part in 2 years, 2022 and 2023. The culture was established by seedling (seedling maturity = 60-65 days) and after planting in the plastic tunnels, the technology specific to tomatoes was applied. The results showed that were considerable differences regarding length (cm) and root volume (cm^3) from 18% in terms of root length to 49% higher volume for plants treated with products used. Furthermore, the application of Rizobac and Bactilis improved soil apparent density, total porosity, and compaction degree. In summary, based on statistical correlation tests, it can be concluded that as the total nitrogen content decreases, the number of bacterial colonies increases proportionally.

Key words*: biological, fertilizers, microorganisms, PGPR, soil.*

THE BEHAVIOR OF SOME MELON GENOTYPES (*CUCUMIS MELO* L.) GROWN ON SANDY SOILS FROM SCDCPN DABULENI

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Abstract

The study was carried out in the period 2022-2023 on the sandy soils of SCDCPN Dăbuleni, characterized by low natural fertility. Six melon genotypes were studied. A great diversity of their morphological and biochemical characteristics was observed. Morphological characteristics such as fruit weight, fruit length and diameter, pulp thickness and fruit shape index were determined for the analyzed fruits. The biochemical characteristics of the fruits, such as total dry matter, soluble dry matter, titratable acidity, carbohydrates, vitamin C and water content, were also analyzed. The best results regarding fruit weight in 2022 (2.48-3.12 kg) were recorded for genotypes: L16, L13, L14 and in 2023 for genotypes L14, L11 and L16 (2.89-3.45kg). The content of soluble dry matter varied in the two years of study between 8.36% at genotype L12 and 9.02% at L14, being a character of the variety, which can also be influenced by environmental conditions. As a result of the study, a great diversity of morphological and biochemical characters was identified, which can be used in the future in the breeding process of existing varieties.

Key words*: melon, morphological characteristics, biochemical characteristics, sandy soils.*

RELATIONSHIP BETWEEN NDVI AND IN SITU DATA IN PEPPER PLANTATIONS ON OPEN FIELD CONDITIONS

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Abstract

Of the spectral vegetation indices, NDVI is one of the most suitable for tracking the dynamics of vegetable crop development. Its values are most accurate in the active phases of pepper growth. Due to the individual nature for the determination of vegetation indices, it is necessary to look for correlation with the analytical measurements of plants. The aim of this paper is to determine the relationship between NDVI and in situ data in pepper plantations, field production in the phases of active plant growth. In situ data collection was carried out in a production pepper plantation, cv. Slonsko uho, grown under field conditions in the village of Katunitsa, Plovdiv region, Bulgaria. Measurements were carried out in two phases - mass flowering (BBCH 59610) and technological maturity (BBCH 73703). Vegetative plants parameters were determined. NDVI was obtained from Sentinel-2 HR multispectral satellite imagery. The relationships between NDVI and in situ data were determined.

Key words*: pepper, productivity, vegetation indices.*

INFLUENCE OF OPAQUE WALL GREENHOUSE MICROCLIMATE ON MELON GROWTH AND FRUITING

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Abstract

Melon (Cucumis melo) belongs to the Cucurbitaceae family and is suitable for cultivation in various systems, such as cultivation in the field, solariums and greenhouses. The present study refers to the behavior of 3 hybrids grown in protected spaces, in the Chinese solarium of the Faculty of Horticulture in Bucharest, in the climatic and social context of 2021.3 hybrids of different origins were used: one Dutch (Antalya F1), one Chinese and one Korean. The culture was established by planting the seedlings, the technology specific to melons was applied in protected spaces. In the case of vegetative growth, but also fruiting, all hybrids had a favorable evolution, even if the temperature was higher than the limit cited in the specialized literature for Cucurbitaceae (35˚C). The plants showed very good vegetative growth, over 2.5 m high, formed between 11 and 19 shoots. From the point of view of fruiting, the hybrids had a production per plant between 0.91 kg for the Korean hybrid, and 3.22 kg for the Chinese hybrid. They stood out for their high SUS content and superior organoleptic qualities.

Key words*: Chinese solarium, hybrids, production protected culture.*

INFLUENCE OF IRRIGATION AND FERTIGATION ON SENSORY CHARACTERISTICS OF FRUITS OF WHITE STRAWBERRY (*FRAGARIA X ANANNASSA* 'SNOW WHITE') GROWN IN BULGARIA

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Abstract

The aim of this paper is to present the effects of the applied regimes of fertilization and irrigation on the sensory characteristics of white strawberry variety. A two factors experiment was conducted during 2023 in unheated greenhouse in the Chelopechene experimental field, Sofia, Bulgaria with drip irrigated and fertigated strawberry variety (Fragaria x Anannassa "Snow White"). The irrigation and the fertilization factors were applied in two rates: I1 - 75% (ETc) I2 - 50% (ETc), F1: optimal fertilization $N_{8.09}P_{12.76}K_{15.62}$; F2 - suboptimal fertilization - 75% (F1). Five treatments were tested: control: I0F0:100% (ETc) without fertigation; I1F1; I1F2; I2F1; I2F2. Sensory analyzes were carried out during the first growing season of the fruits according to indicators: appearance, color, consistency, taste, aroma and general sensory evaluation on a 5-point rating scale, given by 10 experts. It was established that the applied agricultural techniques have an impact on the indicators of appearance, color and aroma of the investigated fruit variants. The total sensory evaluation was statistically distinguishable only in the fruits of the control and the variant with 50% irrigation and 75% fertilization ($p<0.05$).

Key words*: strawberry, irrigation, fertigation, sensory characteristics, Bulgaria.*

STUDY ON THE MEDICINAL APPLICATIONS OF *MOMORDICA CHARANTIA* SPECIES: A REVIEW

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Abstract

Natural products are useful in the treatment of many human ailments as well as in the process of finding new drugs. In general, medications made from naturally occurring products are safer, less expensive, easier to get, and more effective than pure manufactured medications for treating a variety of illnesses. A bitter melon's abundance of bioactive substances, including as saponins, alkaloids, polypeptides, minerals, and vitamins, can help prevent and treat a number of illnesses, including diabetes, cancer, kidney stones, diabetes mellitus, stomach pain, tumor growth, and fever. Steroid saponins, the primary component of BM known as charantin, function similarly to peptides and certain alkaloids in regulating blood sugar levels. By controlling blood cholesterol, M. charantia's therapeutic qualities help reduce cardiovascular diseases including atherosclerosis. tannins are examples of secondary metabolites. Alkaloids, flavonoids, and tannins are only a few of the secondary metabolites with antibacterial qualities found in both fresh and dried leaf extracts of bitter melon. It was demonstrated that the phytochemical content of both leaves exhibited antibacterial action against a range of bacteria, including Bacillus, Streptococcus, E. Coli, Pseudomonas aeruginosa, and Salmonella.

Key words*: Momordica charantia, bitter melon, antidiabetic, wound healing, antimicrobial, anticancer.*

STUDY ON THE EFFECT OF SOME PRODUCTS FOR FOLIAR APPLICATION ON THE PRODUCTIVITY AND ESSENTIAL OIL CONTENT IN CORIANDER SEEDS (*CORIANDRUM SATIVUM* L.)

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Abstract

The field trial was carried out in the period 2015 – 2017 on alluvial-meadow soil type on the territory of the village of Voivodinovo – Central-South Bulgaria. The experiment was carried out with coriander of Yantar cultivar. The following foliar fertilizers were included in the study at the respective rates: Variant 1 – Humustim – 1 l/ha; Variant 2 – Maxgrow – 5 l/ha; Variant 3 – Tecamine vigor – 1,5 l/ha; Variant 4 – Yara Tera kristalon blue – 2,5 kg/ha; Variant 5 – Poly Plant – 1 kg/ha. In order to follow out the effect of those products on the elements of productivity, seed yield and essential oil content, the variants were compared to an untreated control (Variant 6). The results show: the structural elements of the yield, i.e. the number of umbels per plant, the number of seeds per plant, the seed weight per plant and the 1000 seed weight in the treated variants exceeded the untreated control by 4-15%, 5-15.2%, 3.2-15.4% and 6.5-12.5%, respectively. The highest seed yield was produced under the treatment of coriander with leaf fertilizer Yara Tera kristalon blue in dose of 2.5 kg/ha. An increase in the essential oil content from 2.8 to 9.4% was established after treatment with the foliar applied products compared to the untreated control.

Key words: *coriander, fertilizer, productivity, seed yield, essential oil*

STUDY ON THE EFFECT OF NUTRIENT CONCENTRATION ON QUALITY PARAMETERS FOR LETTUCE GROWN ON VARIOUS SUBSTRATE TYPES

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Abstract

The study was carried out in the research greenhouse, within the Horticultural Products Quality Research Center between October-December 2022 and October-December 2023 on lettuce varieties, oak leaf type, Kineta type, and Lollo Bionda type, Lugano variety. Three EC concentrations of the nutrient solution of 1 mS, 1.5 mS and 2.0 mS were used to fertilize the seedlings. Three pH levels were used for each EC type. Differences were found between the experimental variants in terms of seedling growth. The aim of the study was to see the influence of the concentration of the nutrient solution on some growth parameters of lettuce seedlings produced in different types of substrate.

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

THE ROLE OF THE PARENTAL FACTOR IN THE HERITABILITY OF THE BIOCHEMICAL CHARACTERS OF THE TOMATO FRUIT

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Abstract

The paper presents data on the testing results of 5 F_1 reciprocal hybrid combinations and 7 parental forms of tomato based on the content of dry matter, sugars, acidity, vitamin C, lycopene and β-carotene in fruits. The biochemical analysis of parent varieties and reciprocal F_1 hybrids was differentiated – specific to the genotype, the hybrid, the crossing orientation, the analyzed character. By cluster analysis (k-means) of the tomato F_1 parents and hybrids were identified – Vrojainii, Rufina, Flacara, L 10B, and the hybrid combinations F_1 Flacara x Vrojainii, F1 L 10B x Rufina, F_1 Rufina x L 10B, F_1 Vrojainii x Flacara, F_1 Desteptarea x Flacara, F_1 Flacara x Desteptarea, F_1 Flacara x Rufina, F_1 Rufina x Flacara, F_1 Dolgonosic x Mary Gratefully which are characterized by high indices of the biochemical characters, which provides opportunities for their use in breeding programs in quality of the initial material in improving the quality of tomato fruits. The differences in the manifestation of the characters analyzed in the reciprocal F_1 hybrids demonstrate the involvement of the parental factor in their phenotype.

Key words*: tomato, varieties, hybrids, parental effect, dominance, biochemical characters.*

CLIMATE CHANGES AND ITS EFFECTS ON SOILS AND AGRICULTURE IN WESTERN AND SOUTH-WESTERN ROMANIA

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Abstract

The paper refers to certain aspects of risk that have influenced the climate changes of the last two decades, especially after the year 2000. Updated data from the representative meteorological stations belonging to the Banat-Crișana Regional Meteorological Centre are presented. More extensive research was carried out in the case of thermal regime, pluviometric regime, and wind regime, regarding the evolution and deviations of these parameters in western and southwestern Romania compared to the national level. From 1960 until now, average temperatures have increased by up to 1.5°C in the Banat area and by 2-3°C in southern Romania, especially in the summer months. It is also worth noting the anomalies that occurred after 2000. At national level, 2019 was the warmest year. In the period 2012-2022, the most positive thermal anomalies were recorded (0.7-1.9°C), making it the warmest period of 10 consecutive years in the history of meteorological measurements recorded in Romania, with negative effects on soil cover and agriculture.

Key words: *climate change, thermal regime, pluviometric regime, soil cover, agriculture.*

RHIZOPLANE AND RHIZOSPHERE MICROBIAL ACTIVITY IN ECOLOGICALLY CULTIVATED VEGETABLES AND OTHER CROPS

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Abstract

The purpose of the article is to present data from a comparative study of the composition and activity of the microflora from the rhizoplane and rhizosphere in leeks, red beets, chard, spinach, dill, parsley, and common vetch, as well as control sample without vegetation. The experiment was conducted at the training field at the University of Forestry, Sofia, Bulgaria. Microorganisms from the rhizoplane (the surface of the roots) and the rhizosphere, near the roots, were studied. Growing leeks increases the biogenicity of roots and soil to the highest degree. The main share in the composition of the general microflora is occupied by non-spore-forming bacteria in all variants. In the vegetated variants, the catalase value was highest when growing leek, followed by parsley. Cellulase activity is highest in red beets and leeks. The studied microbiological and enzymatic indicators are sensitive indicators of soil fertility and qualitative development of the analyzed crops. The activity of the rhizosphere and rhizoplane microflora depends on the humidity in the root zone, and the number of microorganisms is not the only and independent prerequisite for their activity.

Key words*: catalase, cellulose, legume, microflora, spices.*

NEW VARIETY OF *SOLANUM SYSYMBRIIFOLIUM* OBTAINED AT BRGV BUZAU, ROMANIA

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Abstract

In addition to the classic tomato species of Solanum lycopersicum, the main relict genetic resources with a wild character preserved in the germplasm collection of BRGV Buzau are part of the following subspecies: Solanum torvum, Solanum caripense, Solanum melanocerasum, Solanum quitoense, Solanum mamossum, Solanum sysymbriifolium, Solanum nigrum. Of these, Solanum sisymbriifolium is the genotype that clearly expresses the authenticity of a wild tomato, in its ancestral form, as it was known since ancient times. The species was phenotypical, qualitative and quantitative evaluated at the BRGV Buzău, obtaining a new variety being under approval and named Matilda. The plant has yellow-brown aggressive thorns with an average height of 14.5-15.4 mm on the entire vegetative part, both on the stem, as well as on the shoots, leaves, inflorescence. The berry-type fruit, with an average weight of 7.6 g, is encapsulated in a persistent calyx ornamented with thorns. It is used in intraspecific and interspecific hybridizations, using the rusticity of the species, noting that it grows and fruits well in extreme temperature conditions, having a high capacity to adapt to thermo-hydric stress.

Key words*: biodiversity, conservation, cultivar, litchi, rusticity.*

RESEARCH ON THE INFLUENCE OF THE IRRIGATION REGIME AND ORGANIC FERTILIZATION ON THE CUCUMBER PRODUCTION GROWN ON PERLITE SUBSTRATE

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Abstract

Food security has become an increasingly pressing global challenge, especially with the continuous growth of the world population and the reduction of arable land due to urbanization. Greenhouses, as controlled environments, provide an ideal framework for improving crop production and quality. Hydroponics is an intensive method of agricultural production that offers advanced environmental protection and increased food safety control. Cucumber production is one of the most successful crops in hydroponic systems. The study was conducted in the Automated Research Greenhouse at the Research Center for Studies of Food Quality and Agricultural Products, focusing on the cultivation of the long-fruited cucumber hybrid Peloton. The crop was established in the first cycle using a soilless cultivation system with perlite-filled mats (4 mm diameter). This system serves as an alternative to greenhouse cucumber cultivation. Three fertigation rates of 4 L/day, 3.6 L/day, and 3.2 L/day were employed. The main objective of the study is to identify the most efficient variant regarding the influence of fertigation rates on the number and weight of fruits per plant and overall cucumber production.

Key words*: cucumbers, hydroponic culture, greenhouse, perlite.*

THE EFFECT OF ADDITIONAL OXYGENATION AND LED LIGHTING ON THE GROWTH OF LUGANO AND CARMESI LETTUCE VARIETIES CULTIVATED IN THE NFT SYSTEM

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Abstract

The oxygen concentration in the nutrient solution is extremely important for the health and development of plants, including lettuce. Lettuce plant roots perform respiration, a process through which they absorb oxygen and release carbon dioxide. This metabolic process is essential for providing the energy necessary for growth and optimal plant functioning. An adequate oxygen concentration in the nutrient solution is crucial for the roots to efficiently carry out this process. Insufficient oxygen concentration can lead to inefficient nutrient absorption, thus affecting plant growth and development. The purpose of this paper is to investigate the impact of different lettuce varieties and cultivation technologies on the average plant mass, length, and average root volume. It examines how various growth conditions, such as additional oxygenation and LED lighting, influence the development of lettuce plants, especially the Lugano and Carmesi varieties. By evaluating these factors, the paper aims to provide relevant information for optimizing agricultural practices in lettuce cultivation, with the goal of maximizing production and crop quality.

Key words*: Oxygen, roots, nutrients, respiration, development.*

EFFECT OF MONTMORILLONITE BASED HYDROGELS APPLICATION ON MORPHOLOGICAL CHARACTERISTICS OF LETTUCE SEEDLINGS (*LACTUCA SATIVA*)

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Abstract

The agricultural sector and food production have witnessed persistent expansion in the past few decades. This occurrence has resulted in the excessive utilization of intensive production methodologies, leading to the unsustainable depletion of soil nutrients and water resources. Numerous research endeavors have been undertaken with the aim of examining the influence of hydrogels on the enhancement and optimization of agricultural inputs. The aim of this study is to assess the impact of four different compositions of hydrogels based on montmorillonite on the morphological characteristics of lettuce seedlings (Lactuca sativa) subsequent to the transplanting procedure, in the greenhouse conditions. The effect of the tested hydrogels on the development of the plants was regularly monitored through evaluation of the overall height, number of leaves and the relative content of chlorophyll. The results show no noticeable differences for the height parameters of the samples, meanwhile the total number of leaves and relative content of chlorophyll proved to be significantly higher for the samples cultivated using hydrogels compared to the control samples.

Key words*: hydrogels, lettuce, montmorillonite, morphological parameters.*

THE STUDY OF SOME AMINO ACIDS WITH A ROLE IN THE ADAPTATION OF THE BITTER CUCUMBER (*MOMORDICA CHARANTIA*) TO SALINITY STRESS

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Abstract

Bitter cucumber (Momordica charantia L.) is an annual tropical plant in the family Cucurbitaceae, cultivated worldwide for its bitter fruits that are used both for food and for its many medicinal properties. Salinity is a widespread problem globally and is constantly growing. This limits plant growth and biomass production, especially in arid, semi-arid and tropical areas. To adapt to new environmental conditions, plants can accumulate or consume different metabolites. In this work, proline and aromatic amino acids were determined by the spectrophotometric method. To carry out the determinations, two varieties of bitter cucumber and three experimental lines were used that were treated with saline solutions of different concentrations. Following the analyzes carried out, a tendency to increase the amount of proline was noticed in the variants treated with saline solutions compared to the control, and in the case of aromatic amino acids, a tendency to their decrease was observed proportional to the increase in the concentration of saline solutions. The determinations made highlight the degree of resistance of the studied genotypes to saline stress and the preferential accumulation of metabolites.

Key words*: Momordica charantia, saline stress, amino acids.*

THE INFLUENCE OF TWO TYPES OF EXTRACTS OBTAINED FROM *TAGETES ERECTA* FLOWERS ON RADISH SEEDS

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Abstract

This research paper aimed to evaluate the influence of two types of extracts from the flowers of Tagetes erecta on radish seeds. The extracts were obtained in two organic solvents, ethanol 70% and propylene glycol - PG-50%. Studies were carried out on the phenolic profile, dry matter and antioxidant activity by the DPPH method. The results highlighted that the extract in ethanol had a high concentration only in the total content of flavonoids (6,574 RE mg/mL) compared to the extract in PG (5,111 RE mg/mL) and slightly higher content in polyphenols was found in the case of the PG extract variant. The extract in ethanol 70% registered a higher redox potential (EC50-0.65µl/ml extract). The monitoring of the effect of the extracts was carried out by applying the radish seed germination bioassay. Thereby, the extracts in ethanol showed moderately phytotoxic activity at 0.50% concentration (Gi<80%) and strongly phytotoxic at 1.50% (Gi<50%), and in the case of the extract in PG, they showed moderately phytotoxic activity at 0.50% concentration and a stimulatory effect at 1.50% concentration (Gi>100%).

Key words*: germination bioassay, Tagetes erecta, biostimulants.*

CONTENT OF POTASSIUM AND IRON IN TOMATO PRODUCTS

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Abstract

Tomato (Lycopersicon esculentum Mill.) is an annual vegetable crop whose fruits can be consumed fresh or processed. The aim of this thesis was to determine the amount of potassium and iron in samples of tomato products from different production batches. Sampling was carried out on six tomato products (ketchup, double concentrate, canned tomatoes, pureed tomatoes and chopped tomatoes from conventional and organic farming). Potassium was determined by flame photometry while iron was determined by AAS (Atomic Absorption Spectroscopy). The determined content of potassium in dry matter ranged from 1.36 to 5.37 % K DW. Potassium levels in fresh matter ranged from 185.19 to 1224, 46 mg K/100 g fresh weight. The determined content of iron in dry matter ranged from 24.30 to 155.07 mg Fe/kg DW. Iron levels in fresh matter ranged from 0.42 to 1.23 mg Fe/100 g fresh weight. The highest potassium content in dry and fresh matter was determined in tomato concentrate. The highest iron content in dry matter was determined in chopped tomatoes, while the highest iron content in fresh matter was determined in tomato concentrate.

Key words*: Lycopersicon esculentum Mill., minerals, microelement, macroelement, processing.*

BIOLOGICAL CONTROL OF LETTUCE DROP (*SCLEROTINIA SCLEROTIORUM*) USING ANTAGONISTIC *BACILLUS* SPECIES

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Abstract

Sclerotinia sclerotiorum (Lib.) de Bary is a phytopathogenic fungus that causes lettuce drop, a serious problem of lettuce production. In Bulgaria, the management of rot relies primarily on the strategic application of synthetic fungicides. In an attempt to find alternative strategies for managing the disease, four naturally occurring bacterial isolates were screened for antagonism to S. sclerotiorum. This study reports the in vitro evaluation of the antifungal activity of four strains of B. subtiiis, B. megaterium, B. safensis, and B. mojavensis against S. sclerotiorum. The molecular identification of the isolates involved in the activity was examined by 16s rRNA sequencing. The inhibitory action showed by the filtrates of the bacterial growth broths against S. sclerotiorum highlighted the nature of the molecules involved, that were released. The analysis of the presence of ituA, fenD, and surfA genes confirmed the potential production of cyclic lipopeptides, such as iturin, fengycin, and surfactin, reported as antifungal compounds. Growth promotion was evaluated on seedlings after treatment with suspensions from the four bacteria. The bacterial strains promoted lettuce growth, approving potential biofertilizers for this vegetable.

Key words*: Lettuce, Bacillus spp., biocontrol of lettuce drop, cyclic lipopeptide, biofertilizers.*

USING BIOCHAR AND ORGANIC FERTILIZER IN THE CULTIVATION OF BOK CHOY (*BRASSICA RAPA* L. SSP. *CHINENSIS* L.)

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Abstract

In period during 2022 and 2023 years a pot experiment was conducted in a greenhouse using alluvial-meadow soil. Two seeding dates were tested. Five variants with different doses of biochar and humate fertilizer (Bioforce) was developed. The test crop was leafy vegetable - Bok Choy (Brassica rapa L. ssp. chinensis L.). Results indicate that increased moisture and temperature in the vegetative house caused premature budding and flowering of the plants. In the variant with Soil + Bioforce (humic fertilizer) *showed high photosynthetic activity, while variant Biochar 112.5g per pot + Bioforce (20%) exhibited the best biometric indicators. Plants grown in March-April were taller but had less mass compared to those from December. The mass flowering makes the method suitable for seed production but not for consumption. Sugar levels followed a similar trend in both assessments. The least amount of accumulated sugars was in variant 3 with 50% biochar. Variant 4 consistently had the highest sugar content, ranging from 7.6 to 7.7% brix. The low nitrate content in leaf tissue was evidenced. The nectar`s sugar content and pollen quantity were assessed to determine the honeybee potential of Bok Choy by the tested variants.*

Key words*: Bok Choy, Brassica rapa l. ssp. chinensis L., biochar, humate fertilizer, honeybee potential.*

RESEARCH ON THE VARIABILITY OF PHENOLOGICAL CHARACTERISTICS IN GARLIC GENOTYPES AND THE INFLUENCE OF ENVIRONMENTAL FACTORS ON DIFFERENT VEGETATIVE STAGES

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Abstract

The objective of this study was to analyse the variability of phenological characteristics in garlic genotypes over two vegetation years and to assess the influence of environmental factors on different growth stages across 36 genotypes and two garlic varieties. The primary phenological development stages were examined according to BBCH standards, considering the specific environmental factors of the experimental location (44°21'55"N, 23°48'18"E). For autumn varieties, the vegetative period of garlic genotypes was longer during the 2022/2023 season (253.79 days) compared to 2021/2022 (224.99 days). Conversely, in spring varieties, the vegetative period was shorter in 2023 (108.99 days) than in 2022 (130.5 days). This reduction was attributed to abundant precipitation, influencing the growth and development of the crop and reducing the plant's lifespan. The results underscore the significant impact of environmental factors, particularly temperature and precipitation, on the developmental stages of garlic plants.

Key words*: Allium sativum L., climatic impact, crop phenology.*

THE EFFECT OF CULTURE SUBSTRATE AND WATER STRESS ON TUBER DEVELOPMENT IN THREE SWEET POTATO CULTIVARS ACCLIMATIZED IN THE GREENHOUSE

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Abstract

Starting from the micropropagation and selection of sweet potato varieties that responded best to in vitro water stress conditions, this study aims to identify the most effective methods of plantlets acclimatization in protected space. The three-factor experiment was carried out by combining the following factors, analyzed in several gradations, as follows: experimental factor A-variety, experimental factor B-substrate, experimental factor C-irrigation. Regarding the influence of the culture substrate and the irrigation variant on the tuberization of the three varieties of sweet potato (CD/1, CD/3, CD/4), the CD/1 genotype is noted on the normal irrigation variant and the use of the culture substrate containing: red peat, black and perlite (2: 1: 1), with a very significant positive difference (5.00) at the average number of tubers/pot. On the same culture substrate, but in a deficient level of irrigation, the CD/3 variety recorded at the average mass and the number of tubers a distinctly negative difference (-131.63 g) and a negative significant difference (-3.25), compared to the control variety (CD/4).

Key words: *acclimatization, culture substrate, protected space, sweet potato, water stress.*

AGROBIOLOGICAL AND TECHNOLOGICAL CHARACTERIZATION OF *PHASEOLUS COCCINEUS* L.

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Abstract

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

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

EFFECTS OF TREATMENTS WITH BIOPESTICIDE CARBECOL AND FUNECOL ON TOMATO (*SOLANUM LYCOPERSICUM*. L) LATE BLIGHT

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Abstract

Tomato late blight (Phytophtora infestans) is a major disease of tomato (Solanum lycopersicum L.) in many agricultural regions, causing huge losses in vegetable production. A greenhouse experiment was conducted to investigate the efficacy of the new biofungicide Carbecol alone or in combination with treatments of the biofungicide Funecol in the control of late blight in tomato and their impact on crop productivity. Tomato plants were treated four times during the growing period with Carbecol alone or in combination with treatments of Funecol at different concentrations to control late blight of tomato. The experimental results revealed that foliar disease of late blight in tomato was significantly reduced by treatments applied in combinations of Carbecol and Funecol in comparison with untreated plant or Carbecol alone. However, the best results were reached in the variant with integrated application of Carbecol at a rate of 0.4% plus treatments with Funecol at a rate of 0.4%. The treatments had a beneficial effect on the tomato fruit production. The integrated application of Carbecol and Funecol gave the best effect and the yield increased by 16% in comparison with untreated plants.

Key words*: Biorational products, Carbecol, Funecol, Late blight, tomato.*

RESEARCH ON THE EVOLUTION OF TOMATO VARIETIES AND HYBRIDS CULTIVATED IN ROMANIA

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Abstract

The study was carried out at USAMV Bucharest and aimed to identify the assortment of tomato varieties and hybrids grown in protected spaces and open fields in Romania. Tomatoes are traditional vegetables, rich in carbohydrates, vitamins, lycopene and carotene. Currently, in our country, imported F1 hybrids, extra-early and early, are cultivated in a smaller proportion and in a larger proportion Romanian or imported varieties. F1 hybrids are preferred, because show the phenomenon of heterosis which gives crops resistance/tolerance to diseases, pests, drought, a higher production 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.
This study aims to highlight the large number of varieties adapted and used in the different cultivation areas in Romania, varieties that are recommended for both conventional and organic crops in the different cropping systems.

Key words*: Solanum Lycopersicon, genotypes, productions.*

THE INFLUENCE OF FOLIAR FERTILIZATION WITH HUMIC ACIDS - BASED PRODUCTS ON THE QUALITY OF TOMATO FRUITS

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Abstract

The use of natural biostimulators on crops is an innovative approach, friendly to the environment and with beneficial effects on the quality of production. In this sense, the objective of this study was to evaluate the application of the Lignohumate biostimulator to the tomato crop on fruit quality, depending on the fertilization dose. This is a bio-fertilizer, consisting of a complex of potassium salts of humic and fulvic acids, supplemented with microelements. The biological material was represented by the 'Giraffe F1' tomato hybrid. The specifics of the variants were: V1 (Mt) - unfertilized, V2 - fertilized with 1 g/10 L water, V3 - fertilized with 1.5 g/10 L water, V4 - fertilized with 2.0 g/10 L water. The monitored quality parameters were: total soluble substance, titratable acidity, reducing carbohydrates, ascorbic acid, total carotene, total lycopene and total polyphenols. The recorded data showed that all quality parameters had significant values compared to the control in the variants fertilized with Lignohumate 1.5 g/10 L water and 2.0 g/10 L water.

Key words*: humic substances, Lignohumate, Lycopersicon esculentum, quality.*

A RESEARCH ON THE USE OF ORGANIC FERTILIZERS APPLIED TO TOMATO PRODUCTION

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Abstract

Studies have been conducted with regard to the way in which the elements of tomato field crop yield are influenced by the application of supplementary fertilization with organic fertilizers obtained only from natural ingredients. The organic material used was TAMARIS F1, an early tomato hybrid, recommended for greenhouse, solarium and field palisade cultivation. Based on the analysis of the experimental variants, it was found that the variant additionally fertilized with Plantella Bio had an average fruit weight ranging between 170-180 g, with a yield of 40 t/ha as compared to the control variant where the average fruit weight was between 130-140 g and the yield was 28 t/ha. Consequently, there was a 30% higher yield in the variant fertilized with Plantella Bio than in the reference variant.

Key words*: Plantella, Agrecol, Tamaris, hybrid.*

BIOLOGICAL CONTROL OF MAIN DISEASES AND PESTS ON MELON CROPS IN THE FIELD

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Abstract

The main foliar diseases of melons, Pseudoperonospora cubensis and Sphaerotheca fuliginea, have a negative impact on fruit yield and quality. Also, in warm and dry summer, the mites (Tetranychus urticae) caused significant damages on melons crop in the field. This experiment aimed to study the efficacy of biological plant protection products for the control of mites, powdery and downy mildew on melons crops in field. The experiment includes 2 fungicides for downy mildew based on aluminum fosetyl, Mimosa tenuiflora extract and citrus, 2 biological fungicides for powdery mildew, based on Bacillus amyloliquefaciens Bacillus pumilus and 4 biological products used to mites control, based on potassium salts, mixture of terpenoids, cinnamon extract and saponified oil extract from Neem tree. The biological products had efficacy between 56.25 and 88.25% in the control of the adult mite T. urticae, 47.02 - 66.48% on P. cubensis and 71.25—84.76% on S. fuliginea. It is concluded that it is possible to grow melon in an organic way using these biological products for controlling the main diseases and pest on melons crop in the field.

Key words*: pathogen, mite, downy mildew, powdery mildew, Tetranychus urticae.*

BIOLOGICAL AND CONVENTIONAL CONTROL OF SPHAEROTHECA FULIGINEA PATHOGEN ON ZUCCHINI CROPS

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Abstract

Maintaining a good phytosanitary level of vegetable crops in greenhouses, it is conditioned by application of a complex of measures and means to prevent and control the attack of the pathogen and the pests present in the crops. The main objective of this experience was the control of the pathogen Sphaerotheca fuliginea on zucchini crops in organic and conventional systems, and a comparison was to be made between the efficacy of applied chemical products and the efficacy of biological products. The chemical products (Topas 100 EC 0.5/L/ha, Amistar 1 L/ha, Cidely Top 1 L/ha, Dagonis 0.6 L/ha) had an efficacy between 73.44 and 96.33%, and the biological products (Fytosave 2 L/ha, Funres 3 L/ha, Mimoten 3 L/ha, Canelys 3 L/ha) between 20.74 and 56.90% for Diana, Perfect and Eskenderany varieties. In the zucchini crops in greenhouses, the chemical products applied in the conventional system had a much higher efficacy than the biological products.

Key words*: disease, zucchini, Sphaerotheca fuliginea, pathogen, greenhouse.*

THE INFLUENCE OF LIGHT INTENSITY ON YIELD AND MINERAL CONTENTS OF FOUR LETTUCE SPECIES CULTIVATED IN NUTRIENT FILM TECHNIQUE (NFT)

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Abstract

Lettuce cultivation in hydroponic systems using the Nutrient Film Technique (NFT) is widely practiced globally, and it can be done under either natural light or LED light conditions. LED lights are commonly employed in plant factories or as supplemental lighting during periods of insufficient natural light, such as the winter season. To achieve optimal growth and quality of vegetables grown in NFT system, various factors need to be considered, including temperature, light intensity, humidity, and others. Our study aimed to investigate the yield and mineral content of lettuce cultivars grown under natural light and LED light conditions. The experiment was conducted at a greenhouse in USAMV. We observed that lettuce cultivated under natural light conditions exhibited higher fresh weight, dry matter, phosphorus, iron, and copper content. Conversely, lettuce grown under LED light conditions showed higher nitrate, potassium, calcium, magnesium, and zinc levels.

Key words*: Lettuce, natural light, LED light, macro and micronutrients.*

POPULATION MANAGEMENT OF *MYZUS PERSICAE* (SULZER) IN *SOLANUM TUBEROSUM* AGROECOSYSTEM USING CHEMICAL AND BIOLOGICAL PRODUCTS

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Abstract

Myzus persicae produces significant economic losses in the agroecosystem of Solanum tuberosum, through direct and indirect damage. The aim of this study was to control the population of Myzus persicae, in the potato crop, by applying the substance acetamiprid and biological products based on potassium salt (Kabon and Konia) and Bacillus thuringiensis (Bitoxybacilin). The study included seven variants, acetamiprid was applied in three doses (0.13 l/ha; 0.09 l/ha; 0.08 l/ha), 0.900 l/ha was applied in the variants treated with Kabon and Konia K Plus and 1.0 l/ha Bitoxybacilin. The efficiency of the biological and chemical products was compared with the control variant (untreated). Phytosanitary products were applied on 27.05.2022. The efficacy of the treatments was assessed 3, 7, 14, 21, 28 days after application, by analyzing 25 plants/variant. On the day of the treatment's application, the number of individuals of Myzus persicae was 274-284/25 plants. Acetamiprid 0.13 l/ha significantly reduced the aphid population. Among the biological products, Konia K Plus stood out. 28 days after application, the effectiveness of the products to control the Myzus pericae species decreased.

Key words*: Myzus persicae, efficacy, Solanum tuberosum, treatments, biological products.*

THE INFLUENCE OF THE TEMPERATURE REGIME ON THE QUALITY INDICATORS OF TOMATOES GROWN IN OPEN GROUND

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Abstract

The vegetable growing occupies one of the leading places in the agricultural sector of Ukraine, as it provides the population with necessary food and raw materials for industry. The developed agro-industrial sector uses various fertilizers, irrigation and aeration technologies, which are able to increase the yield of various crops several times [1]. Among vegetable crops in Ukraine, tomatoes occupy an area of 93 thousand hectares and are among the most common among all vegetables. At the same time, these crops are quite demanding regarding the level of humidity, light, temperature, and soil fertility [2, 3]. The ripening process of tomatoes is a complex process of synthesis and decomposition of organic compounds, which is regulated by metabolism. The rate of fruit ripening is coordinated and regulated by plant hormones, but can be modified by genetic and environmental factors. The quality of tomato fruits is determined by color, texture, taste and absence of wrinkling (Gautier et al., 2008) [4,5]. At the same time, the content of solid soluble substances (SSR) of lycopene and carotenoids are important criteria for the quality of tomatoes.

Key words*: growing tomatoes, licopin, temperature.*

MORPHOLOGICAL CHARACTERIZATION OF SOME DWARF BEAN SEEDS FROM SCDL BUZĂU COLLECTION

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Abstract

Over 400 bean lines can be found in the bean germplasm collection of the V.R.D.S. Buzău, Romania. Maintaining the collection requires achieving the following objectives: preserving the species (Phaseolus vulgaris L.) diversity, developing new kinds, and climate-change-adaptability. In this regard, 40 lines from this collection were tested in the field in 2023 and based on the preliminary results, the best ones will be selected to be further studied in order to obtain a new variety of beans. This work presents the variability of the main seed's characteristics of 10 lines of dwarf bean from the collection, which were selected for their characteristics, productivity and resistance to negative environmental conditions. The aim of this study was to make observation and assessment on each line`s seeds for their quantitative (seed weight, length, thickness) and qualitative (seed color, brilliance, veining) characteristics, in order to maintain the collection and create one or more varieties of beans. The results show that the selected lines are stable and can be used for the development of new dwarf bean varieties to ensure their diversity.

Key words*: variability, collection, lines, Phaseolus vulgaris L.var. communis.*

RELATIONSHIPS BETWEEN RGB COLOR CHARACTERISTICS AND TOMATO FRUIT QUALITY

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Abstract

The present study aimed to establish the relationship between the characteristics of RGB images of tomato fruits of three cultivars and important indicators of the quality of these fruits. In the study, 30 fruits from three cultivars at different ripening stages were used. The digital images of each tomato from four sides were obtained using a document camera. The same fruits were analyzed for dry matter, total dyes, vitamin C, titr. organic acids, beta carotene and lycopene content. The data of each image's G, R, and B channels were extracted and averaged. The average data of grayscale were taken as well. Based on the color characteristics and the chemical analyses, a procedure of descriptive statistics, correlation, and regression analysis was performed. The image procedure of all obtained data was performed using Jupyter notebook. The highest correlation coefficient (-0.860) was obtained between the Gray channel and total dye content, followed by the strong correlation between the Green channel and lycopene content (-0.820). And the models with the highest predictive ability were the models for total dye by Gray channel values (R^2 = 0.815) and lycopene by Green channel (R^2 = 0.761).

Key words*: tomato, images, color, Jupyter notebook, regression.*

RESEARCH ON THE EFFECT OF SALINITY ON TOMATO (*LYCOPERSICON ESCULENTUM* MILL.) DURING THE SEED GERMINATION STAGE AND ON THE VEGETATION PERIOD: REVIEW

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Abstract

The tomato is a major annual crop that is grown all over the world for the nourishment of consumers. Since it is predicted that by 2050, over 50% of arable land will be saline, researchers have recently concentrated on understanding how tomato plants respond to different saline environments. The tomato is regarded as "moderately tolerant" of salinity because of its capacity to maintain ionic and water balance in the root zone at moderate salinity levels and because it is more vulnerable to salt stress than its wild equivalents. Some papers include information on how different cultivars behave under different salinity concentrations, analyse various parameters, and discuss the mechanisms regarding tomato salt tolerance. When the salt concentration increased, tomato seed germination was reduced, the time required for full germination was prolonged, plant growth and productivity were limited, and sometimes it led to plant death. Therefore, this review provides a synthesised understanding of the latest scientific findings about the impact of salinity on tomato fruit morphology (germination and seedling growth), physiological (transpiration), biochemical characteristics, as well as yield and fruit quality indicators.

Key words*: genotypes, tomato seeds, salinity stress, germination.*

SMALL HOLDINGS IN MOUNTAIN AND SEMI-MOUNTAIN AREAS IN BULGARIA AND THEIR IMPACT ON AGROBIODIVERSITY

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Abstract

Agrifood system includes the totality of the stakeholders, interactions and decisions that contribute to agricultural production. Small farms are highly vulnerable to climate change because most depend on weather conditions, especially rainfall, cultivate small areas in mountainous areas and hard-to-reach areas, and do not have access to technical or financial support. Local and traditional varieties play an important role, as a resource for breeding, sustainable crop diversity in farms or to compliment diets with organic products. Plant diversity grown in small holdings in Bulgaria is characterized by a large number of crops: vegetables, grain legumes, medicinal and aromatic species. The sustainable production of horticultural crops provides a key part of the healthy food. Our aim is to explore developing of conserved collections through new information strategies, supporting free access to plant gene fund. The study provides information on crop diversity in rural areas using the survey method and analysing the passport data from conducted collection missions. Based on results argent activity plan to improve protection of these valuable plant genetic resources for guarantee our food and agriculture will be recommended.

Key words*: climate changes, horticultural crops, landraces, data base, genebank.*

EVALUATION OF SOME NUTRITIONAL COMPOUNDS OF GARLIC *(ALLIUM SATIVUM L.*) PEEL WASTE

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Abstract

Garlic (Allium sativum L.) is known as a valuable spice and common medicine for various diseases. The bulb of garlic is a rich source of nutritional compounds (carbohydrates, proteins, minerals, fibre), vitamin and other biologically active natural compounds, with beneficial effects on the body's health. The skins obtained when peeling the garlic bulb also contain important amounts of proteins, fibres, minerals, carbohydrates and essential phytochemicals. The purpose of this work is to evaluate the content of nutritional compounds from the peel of garlic bulbs sold in local agri-food markets. The obtained results show that the analysed garlic peel contains important amounts of nutritional compounds whose value varies depending on the origin of the garlic: 4.21-5.36% moisture, 15.18-16.53% minerals, 7.38-8.11 protein, 58.77-63.46% fibres, 20.56-21.64%, 0.52-0.78% fat. The preliminary results suggest that the investigated garlic peel could be considered for obtaining products with additional content of nutritional compounds. Also, the superior valorization of garlic peels can be an ecological method of garlic peel waste resulting from peeling garlic bulbs.

Key words*: garlic**, garlic peel, by-products, nutritional parameters.*

EFFECT OF DROUGHT STRESS ON PROLINE AND CHLOROPHYLL CONTENTS IN SOME TOMATO GENOTYPES

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Abstract

*Drought is the most important factor affecting yield loss in global agriculture. Drought stress negatively affects the physiological, genetic, biochemical, and morphological characteristics of plants. The objective of this study was to determine whether there are differential responses to drought stress on proline and chlorophyll content in some tomato genotypes. Drought deficit was induced by polyethylene-glycol (PEG 6000) solution using a control and two variants with different osmotic pressures (-2.72 Bars, -4.48 Bars). The determination of proline and chlorophyll content was evaluated after periods of 7/14 and 21 days after the induction of drought stress. Comparing the biological material studied, it can be observed that different concentrations of PEG 6000 influenced differently the analysed genotypes. High levels of proline content during drought stress were noticed also in Pontica, Viorica, Darsirius, and Buzau 47. The chlorophyll content of the leaves decreased proportionally with drought induction. The lowest chlorophyll content was recorded (*22,965 *SPAD units) after a longer period of water stress. The obtained results will be useful to serve in plant breeding programs.*

Key words*: tomato genotypes, proline and chlorophyll content, drought stress.*

YIELD AND QUALITY EVALUATION OF L 548, VITAMINA, THE NEW TOMATO VARIETY OBTAINED AT BRGV BUZĂU

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Abstract

The researchers of BRGV Buzau had the preservation and improvement of local old autochthonous varieties and landraces as their purpose. In 2022, through repeated individual selection, the variety for fresh consumption with indeterminate growth registered at ISTIS with the provisional name of Vitamina was obtained. The strong distinguishing character of the variety is given by the fruit color. It is yellow, slightly orange. The fruits are large, round, slightly ribbed, with a weight that varies between 96-315 g. In addition to the high production potential, the variety presents an added quality given by the fruits taste and aroma and their richness in beneficial and healthy substances, leading the authors to propose the name Vitamina. It has the U gene, which express medium green cap immature fruit, but also specific taste and aroma given by the SGLK2 gene complex. The variety shows main pathogens attack high resistance and also has the nematode repellence mi gene. The market tests carried out so far with more than 1000 growers, have been favorable to the variety, and it enjoys a lot of appreciation.

Key words*: autochthonous, expressiveness, repellency, aroma, local landrace.*

NEW CHERRY TOMATOES VARIETIES OBTAINED AT BRGV BUZĂU

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Abstract

BRGV Buzău owns a rich germplasm collection of tomato, consisting of over 3600 genotypes, over 35% of which are cherry cultivars. The research aimed to obtain new cherry type varieties with high yield potential and superior quality, especially taste and aroma, with high resistance to the main pathogens attack. The research was completed with obtaining a large number of lines, and 4 of them were registered for homologation and patenting. These received the provisional names of Serena, Simila, Rapsodia and Monalisa. Simila variety has round, slightly juicy, tasty dark brown fruits, with an average weight of 12 g. Serena variety presents red, round, slightly ovoid, firm, tasty fruits, with an average weight of 17 g. Rapsodia variety presents brindle, green with burgundy-red fruits, round, firm, tasty, brown-pink pulp, with an average weight of 23 .5 g. Monalisa variety has red, ovoid, crunchy, tasty fruits, with an average weight of 15 g, being very productive. Research will continue with the promotion of these varieties as crops and by increasing the seeding surfaces and obtaining new valuable varieties.

Key words*: directions of use, interspecific, kumato, local landraces, selection.*

PRE-TREATMENT OF SLOW-GERMINATING APIACEAE SEEDS FOR MICROGREENS

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Abstract

The purpose of the experiment is to test the application of different fertilizers, as growth regulators, for soaking slow-germinating seeds of the family Apiaceae, in the cultivation of microgreens. A potted laboratory experiment was prepared at the University of Forestry. Four fertilizers were tested: Bioforce, Humustim, Biotor, and Algreen, with four of the species of the Apiaceae family, suitable for growing microgreens: dill, carrot, parsley, and celery. Six variants were developed: the four fertilizers and two controls - with non-soaked seeds and with seeds soaked only in water. The seeds are soaked for 24 hours before sowing. Sowing is done in plates for microgreens, on a peat substrate. Of the four tested fertilizers as growth stimulators, Biotor shows the most complex results - it accelerates germination, affects the content of dry matter, increases the level of total sugars, and affects plastid pigments.

Key words*: Apiaceae, growth regulators, microgreens, soaked seed.*

FLORICULTURE, ORNAMENTAL PLANTS, DESIGN AND LANDSCAPE ARCHITECTURE

PHYTOTOXICITY EFFECTS OF LEAD ON SEEDS GERMINATION AND SEEDLING GROWTH OF `WIZARD ROSE` AND `WIZARD JADE` COLEUS VARIETIES

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Abstract

The study presents the comparative analysis on the impact of different concentrations of Pb(II) (25 to 300 mg/kg) on germination, seedling rate, velocity, tolerance index, toxicity index and vigour index at Coleus blumei 'Wizard Rose' and 'Wizard Jade'. The experience was conducted in 6 variants with 3 replicates, each replicate having 10 seeds. The humidity of the substrate was performed with water for the control sample (C) and with $PbCl_2$ solutions for the other 5 variants. At high concentrations of lead (300 mg/l), a significant decrease in the germination percentage can be seen of approximately 20% in the case of the 'Wizard Rose' coleus and 50% in the case of the 'Wizard Jade' coleus. The results obtained in the study show that lead had the highest inhibitory effect on germination, seedling rate, velocity, and plant growth at the coleus 'Wizard Jade'. The degree tolerance of Coleus blumei varieties to the stress caused by the lead decreases with the increase in the concentration of Pb(II), coleus 'Wizard Rose' highlighting a better tolerance to Pb(II) compared to coleus 'Wizard Jade'.

Key words*: Coleus blumei, germination, toxicity, velocity.*

THE INFLUENCE OF SOME GROWTH REGULATORS ON THE GERMINABILITY AND DEVELOPMENT AT *ALBIZIA JULIBRISSIN* DURAZZ.

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Abstract

Among the multitude of dendrological species with high decorative value, Albizia genus is of particular importance in the landscape design especially in the conditions of our country which are generally favorable and very favorable for the growth of these species. The purpose of the present work is to highlight the ornamental potential of the best-known species of Albizia genus. Albizia julibrissin Durazz. *seeds were used for the experiment. Propagation of this species can be done quite easily by seeds, provided that the pods are harvested in October and the sowing is done in the spring (Sandu, 2009). Observations were made regarding the evolution in different periods of the vegetation, aiming the development regarding the germinability, growth and development of seedlings under the action of some rooting regulators, namely Radi-Stim Nr. 2, Asfac-4 25 ppm and Asfac-4 20 ppm. The variants treated with these regulators had a particular importance on seed germination, in terms of a deeper rooting, resulting in much more vigorous plants.*

Key words*: seedlings, variants, growth regulators, Albizia*, *germinability.*

PAULOWNIA IMPERIALIS, PRINCESS PAVLOVA'S TREE: DEVELOPING A PLANTATION IN ROMANIA

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Abstract

Paulownia is the fastest-growing tree species in Romania compared to other dendrological species. The development of this species for commercial purposes can be achieved in 4-6 years if certain pedological, agrochemical, and agrotechnical factors are respected, along with specific maintenance work. This study analyzed two hybrid varieties: Paulownia 'Cotevisa 2' and Paulownia 'Superhibrid Z 07'. The establishment and maintenance work, as well as the growth evolution of these varieties, were monitored. The main objective is to obtain data that contribute to the success of Paulownia cultivation in Romania, due to the lack of information regarding the cultivation and maintenance of this plant.

Key words: *paulownia, timber, flowers.*

CURRENT STATE OF RESEARCH ON BIOLOGICAL, ORNAMENTAL AND UTILITARIAN PARTICULARITIES OF SOME SPECIES OF THE GENUS *SALVIA* L. (LAMIACEAE)

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Abstract

This paper is a synthesis of research on the history and current state of knowledge regarding the biological, ornamental and utilitarian characteristics of some species of the genus Salvia L. (Lamiaceae).The analysis aimed to identify the literature from the Romanian and international academic literature, in which the genus Salvia L. (Lamiaceae) is treated, paying particular attention to the species Salvia officinalis, Salvia nemorosa, Salvia splendens, Salvia mellifera.During the activity carried out, historical milestones were determined and highlighted from the perspective of the scientific treatment of the genus Salvia, and a deeper dive into the already existing knowledge has been attempted, focusing on analyzing and capitalizing on the identified specialized works in which the biological, utilitarian and ornamental peculiarities are addressed.The results of the research highlight the importance of the species studied, as they may have an important practical use, both for lovers of sage flowers, as a garden plant, and for researchers and professional growers, as a medicinal and/or honey plant.

Keywords: *biological, decorative, medicinal, melliferous.*

A MULTIPLE LINEAR REGRESSION MODEL TO ESTIMATE THE PLANT COVERAGE OF A GREEN WALL SYSTEM

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Abstract

Recently, green walls have come to the attention of researchers from several fields, as a result of the concerted effort to find viable solutions to stop/mitigate urban pollution that produces numerous negative effects. The viability of a green wall consists in the use of plants with a high aesthetic appearance, which are resistant to environmental conditions and ensure a quick and compact coverage. The present paper proposes a multiple linear regression model for the plant coverage of a vertical system in which the soil moisture and temperature are explanatory variables. The questions that we address and answer in this paper are related to the dependence of the plant coverage on the orientation of the wall and the influence of the plant coverage on the temperature inside a green wall system.

Key words*: green walls, multiple linear regression model, plant coverage.*

IN VITRO EVALUATION OF SALT AND DROUGHT STRESS TOLERANCE IN *HYPERICUM CALYCINUM* L.

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Abstract

*Hypericum calycinum L. is a species of the genus Hypericum with pharmaceutical, ornamental, and landscape potential. To assess the salt and drought tolerance stress, in vitro cultures grown on media supplemented with different concentrations of NaCl (0; 10; 30; 50; 100 mM) and PEG 6000 (0; 10; 20; 30; 50 g/l) were used. After six weeks of in vitro culture under salinity and drought stress conditions, the following parameters were evaluated: viability, number of shoots, shoot length, rooting percentage, number of roots, root length, fresh weight, dry weight, water content, stress tolerance index (STI), and McKinney index (MKI). The viability of initial explants was higher under low salt stress (100% under 10 mM NaCl) compared to low drought stress (80% under 10 g/l PEG 6000). Drought stress caused a decrease in shoot height under all concentrations of PEG 6000, while the longest shoots (4.38 ± 0.22 cm) were obtained on the culture medium supplemented with 10 mM NaCl. The rooting percentage was 0% using concentrations of 30, 50, and 100 mM NaCl and 20, 30, and 50 g/l PEG. Our results showed that H. calycinum had a higher sensitivity to drought stress compared to salt stress***.***

Key words*: abiotic stress, drought, in vitro, PEG 6000, salinity.*

A REDEVELOPMENT SOLUTION FOR THE "ALEXANDRU SAHIA" PARK IN RĂDĂUȚI

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Abstract

This study investigates the rehabilitation of a green area found in the city of Rădăuți, Suceava. Since the '60s, the 'Alexandru Sahia' Park has been a suitable oasis for its inhabitants, for socializing and relaxation, especially during hot summer days. Considering its current state of deterioration, mainly due to decay of its elements and poor maintenance works, the park no longer fully meets the needs of the community. The proposed solution aims to fulfil the functional, environmental, and aesthetic requirements so that each area can reach its optimal potential from all perspectives and put at the community's disposal a relaxation and recreation oasis, where people could rest or have fun, socialize, and benefit from a higher quality of life. The solution meets both the needs of the citizens living near the park and of the students passing through the park on their way to the three nearby educational institutions.

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

CARULASPIS JUNIPERI (BOUCHÉ) (DIASPIDIDAE: CARULASPIS), PEST OF THUJA FROM TIMIȘ COUNTY - CASE STUDY

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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.*

VEGETATIVE PROPAGATION SYSTEM FOR HELICHRYSUM ITALICUM PLANTS WITH ORNAMENTAL AND MEDICINAL PROPERTIES

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Abstract

Market demand for Helichrysum italicum (Asteraceae) is growing, especially for its valuable essential oils; however, seed quality and crop growth are variable. Among the various methods of vegetative propagation, propagation by stem cuttings is one of the most viable techniques that allow multiplication of genotypes of interest to achieve crop uniformity. Therefore, the aim of this work was to develop a sustainable vegetative multiplication system under controlled growing conditions. For this purpose, H. italicum seedlings were grown on different experimental substrate variants. Growth and vegetative development parameters of the seedlings were monitored, such as: average number of seedlings, average height of seedlings, length and number of roots. The results showed that the best substrates for root growth and rapid seedling production of H. italicum were: perlite and rooting with Radistim 2 (V5 a2b2) followed by perlite with peat and Radistim 2 (V8 a3b2) and perlite with peat and rooting with Atonik solution (V9 a3b3). The results obtained may contribute to the expansion of H. italicum cultivation in Romania for use as a medicinal plant or in the food industry.

Key words*: cuttings, culture conditions, Helichrysum italicum, vegetative propagation system.*

STUDIES ON THE INFLUENCE OF GROWTH REGULATORS IN THE *IN VITRO* MULTIPLICATION OF TWO VARIETIES OF PITAYA (*HYLOCEREUS UNDATUS*)

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Abstract

Dragon fruit (Hylocereus undatus) belongs to the Cactaceae family and is a species cultivated for fruit consumption due to its rich content of vitamins, minerals and an excellent source of antioxidants (betacyanin), but also vegetable albumin, vitamins and water-soluble fibres. The best method for rapid plant multiplication is cell and tissue culture, so in this study we followed the influence of different growth hormones on micropropagation and rooting, in two varieties of pitaya (Vietnamese White dragon fruit and Red Jiana Dragon Fruit). Thus, the shoots obtained from the seeds were grown on Murashige and Skoog (MS) culture medium supplemented with two types of cytokinins: 6-benzyl amino purine (BAP) – 2.5 mg/l and kinetin (KIN) – 2 mg/ l, respectively naphthaleneacetic acid (NAA) – 1 mg/l, for multiplication, and for the rooting of the shoots, Murashige and Skoog (MS) medium supplemented with 1 mg/l IBA, respectively the medium without growth regulators, was used. The results obtained were different depending on the variety, but also on the type of growth regulators used.

Key words*: pitaya, micropropagation, Murashige and Skoog, growth regulators.*

LEAF STOMATAL TRAITS AND ASSOCIATED PHYSIOLOGICAL PARAMETERS IN DIFFERENT DECIDUOUS ORNAMENTAL TREES DURING AUTUMN SENESCENCE

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Abstract

Global warming and the climate associated changes generally influence on plant phenology throughout their entire ontogenetic cycle (including autumn phenology), also having an impact on different ecological processes and on ecosystems. Stomata are specialized cellular structures located in the plant epidermis, which have a great importance for plant physiology, evolution, and global ecology. They are known especially for their role in carrying out the gases exchange, but their contribution to the maintenance of optimal leaf temperature, water, and nutrients uptake, as well as to assuring the continuity of their transport throughout the plant cannot be neglected This paper describes: 1) characteristics of stomata in mature leaves of some deciduous ornamental trees grown in the Botanical Garden of the University of Agronomical Sciences and Veterinary Medicine from Bucharest, Romania; 2) water use efficiency, quantum yield, and transpiration: stomatal conductance ratio, during autumn senescence. Both indicators' categories can be promising to predict the autumn phenological shifts of the studied species driven under urban area conditions.

Key words: *Botanical Garden; deciduous ornamental trees; leaf stomata; water use efficiency; leaf senescence*.

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STUDY ON THE USE OF PAPER WASTE AS AN ALTERNATIVE SUBSTRATE FOR *FICUS BENJAMINA* SPECIES

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Abstract

The main objective of the paper was to establish the effectiveness of paper waste added to a growth medium, avoiding waste management processes, which require time and energy, but providing an efficient solution for using paper waste as a nutrient substrate for plants cultivated in containers. It was specifically aimed to evaluate the percentage of peat that could be replaced by waste paper for the ornamental plant Ficus benjamina cv. Golden King in an experiment with 4 variants in 3 repetitions (V1-100% peat, V2- 80% peat+20 % paper waste, V3-70% peat+30% paper waste, V4-50% peat+50% paper waste) in 2023. In conclusion, based on the research carried out, it can be stated that paper waste mixed with peat in a proportion of 30% can be used as an alternative substrate.

Key words*: paper, waste, alternative substrate, peat.*

ANTIBACTERIAL ACTIVITY AND GC-MS ANALYSIS OF ESSENTIAL OIL FROM *DOMBEYA SPECTABILIS* FLOWERS

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Abstract

This study was carried out to assess the antibacterial activity of essential oil extracted from Dombeya spectabilis flowers by microwave assisted method, and identification of the compounds in the oil through GC-MS analysis. The flowers of D. spectabilis yielded 0.093% of essential oil. Antibacterial activity of the oil was assessed against four bacterial species namely Staphylococcus aureus, Klebsiella pneumoniae, Escherichia coli and Pseudomonas aeruginosa. The oil showed a variable activity against different bacterial species. E. coli was the most susceptible bacterial species with 13 mm zone of inhibition followed by S. aureus (12 mm), K. pneumoniae (11 mm) and P. aeruginosa (9 mm). GC-MS analysis revealed the occurrence of 13 compounds. The predominant compound was pentacosane (36.75%) followed by heptacosane (16.46%) and octadecane (13.78%). Other important compounds included 2-pentadecanone, 6,10,14-trimethyl- (5.2%), eicosane (4.79%), phytol (4.59%), tetracosane (4.49%), eucalyptol (2.98%), and hexacosane (2.93%).

Key words*: antibacterial, Dombeya spectabilis, essential oil, flower.*

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PRELIMINARY RESEARCH ON THE EFFECTS OF BIOEXTRACTS FROM FICUS CARICA LEAVES ON CHILI PEPPER (*CAPSICUM ANNUUM*) PLANTS CULTIVATED FOR ORNAMENTAL PURPOSES

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Abstract

The main objective of this research was to obtain a preliminary evaluation of the influence of fig leaf bioextract on germination, growth and general development of plants obtained from treated seeds. The bioextract, produced from the maceration of fig leaves in distilled water, was applied to chili pepper (Capsicum annuum) seeds in order to improve the parameters of the seeds and the plants developing from them. Particularly, subsequent observations revealed a substantial increase in the growth and flowering capacity of plants obtained from seeds treated with this extract compared to the control group. These initial results support the potential efficiency of fig leaf bioextract as a viable stimulant for the growth and development of edible ornamental chili pepper plants. However, the investigation remains ongoing and further examinations will be done in order to validate and strengthen these preliminary results.

Key words*: bioextract, fig leaves, Capsicum annuum.*

INVESTIGATIONS ON THE BIOACTIVE COMPOUNDS AND ORNAMENTAL PROPERTIES OF SOME LAVENDER CULTIVARS

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Abstract

Lavandula angustifolia L. is a perennial plant with multiple uses in the cosmetic, pharmaceutical, food, aromatherapy industry and for ornamental purposes. Six lavender cultivars were used for measurements, laboratory analyses and decorations: L. angustifolia 'Hidcote', L. angustifolia 'Sevstopolis', L. angustifolia 'Nana Alba', L. angustifolia 'Dwarf Blue', L. angustifolia 'Blue Scent', Lavandula x intermedia 'Grosso', grown under field conditions. The ATR-FTIR spectra of various tissues of lavenders used in this experiment have revealed presence of a wide range of biochemical compounds with pharmaceutical importance. The content of lycopene, β-carotene, flavonoids, tannins and the antioxidant activity of each cultivar were determined, using UV-Vis spectroscopy. The best antioxidant activity has been noted in the 'Sevtopolis' cultivar, the 'Blue Scent' has the highest percentage of lycopene (3.47 mg/100 g) and the 'Dwarf White' cultivar the large amount of β-carotene (3.25 mg/100 g). The ornamental qualities have been highlighted by making decorations to create a relaxing space. The data obtained will help to identify the cultivars with the most biologically active principles as well as those with special decorative qualities.

Key words*: Lavender, UV-Vis spectroscopy, ATR-FTIR spectroscopy, ornamental, bioactive compounds.*

LANDSCAPE STUDY ON THE USE OF WOOD IN THE REHABILITATION OF THE "BOJDEUCA ION CREANGA" MUSEUM GARDEN IN IASI

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Abstract

This work presents the idea of arranging the space in the courtyard of the "Bojdeuca Ion Creanga" Museum in Iasi. The objective is to make the space more efficient and create a favorable environment for specific activities. Through a detailed study of the site and a documentary study on the history of the building, the need for rehabilitation and appropriate landscaping was identified. The project is designed in a predominantly geometric style, combining the geometric elements imposed by the plan form with free plant design elements to give the whole composition a harmonious and aesthetic appearance. By strategically dividing the space into distinct functional areas and equipping them with specific furniture and plant elements, the landscaping will provide an optimal setting for cultural, recreational, and leisure activities within the museum. Thus, by integrating the ideas of landscaping with wooden objects in the proposed context, a new and valuable framework will be created for the experience offered to visitors in the courtyard of Ion Creanga's Bojdeuca Museum in Iasi.

Key words*: museum garden arragement, public garden rehabilitation, wood landscape design.*

IN VITRO PROPAGATION OF *SAINTPAULIA IONANTHA* WENDL. GENOTYPES AND ASSESSMENT OF GENETIC STABILITY OF REGENERATED PLANTS USING CDDP MARKERS

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Abstract

A micropropagation protocol via direct shoot organogenesis from leaf explants of six commercial varieties of Saintpaulia ionantha Wendl was established in this study. The shoot induction was successfully achieved on Murashige and Skoog (MS) media supplemented with 0.2 mg L^{-1} indole-3-acetic acid (IAA) and 0.5 mg L^{-1} benzylaminopurine (BA). In proliferation stage, the effects of two combinations of PGRs (V1-0.2 mg L^{-1} IAA + 0.2 mg L^{-1} BA and V2-0.2 mg L^{-1} NAA +1 mg L^{-1} BA) on shoot number and length were examined for each genotype. The results suggest that PGR's combinations significantly influenced shoot proliferation in all analysed variety and among the treatments 0.2 mg L^{-1} NAA in combination with 1 mg L^{-1} BA was the most effective for in vitro shoot multiplication. The in vitro rooting percentage was 86.86-96.66% and was varieties-dependent. In vitro-raised plants showed a very high rate of survival (82-94 %). The genetic fidelity between the selected vitro-plants and mother plants were confirmed by CDDP markers.

Key words*: in vitro culture; African violets; molecular markers; genetic fidelity.*

VARIABILITY STUDIES OF LOCAL POPULATIONS OF *ANACAMPTIS LAXIFLORA* SSP. *ELEGANCE* LAM. SSP. *ELEGANS* (HEUFFEL) SOÓ FROM THE OLTENIA REGION, ROMANIA

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Abstract

Orchids are some of the most popular flowers. They are appreciated for their beauty and the varied range of colors and shapes Anacamptis laxiflora ssp. elegans is a "gem of the Romanian landscape" that grows in meadows, forest edges and clearings. The unique characteristics of this orchid species are to be appreciated because of its morphological complexity. Comparative analysis of plant morphological traits indicates that there are significant differences between natural populations of this terrestrial orchid species. A special priority should be given to this type of orchid because they are very common in the habitats of the Oltenia region and have large populations. Their monitoring in the context of global warming is also necessary, and one of the conservation priorities concerns the protection of the habitats in which they occur. Regarding the analysis of character variability according to plant density, it influences the average plant length, stem diameter and leaf number/pl., so the values recorded for these characters have significant differences compared to the values recorded by plants at lower densities of individuals.

Key words*: Anacamptis laxiflora ssp. elegans, morphological characters, population, variability.*

THE EFFECT OF TREATMENTS WITH BIOFERTILIZER AND/OR ANTIOXIDANT PRODUCTS ON THE GROWTH AND DEVELOPMENT OF *HYDRANGEA HORTENSIS* SM. PLANTS

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Abstract

The present study was conducted at the Floriculture Research Area, Faculty of Horticulture, University of Craiova, with the objective to investigate the effect of foliar applications of some natural fertilizers and biostimulants products on the growth and development of Hydrangea hortensis plants. Foliar application treatments were: humic acids - HA 2.5%, grape seed extract - GSE 0.25%, a mixture of HA + GSE (1:1), Bionat Plus 0,2% and control (treated with tap water), resulting in five experimental variants. The results showed that treatments with Bionat positively influenced vegetative growth, and regarding flowering, the best results were recorded in the HA and HA+GSE variants. The treatments with the Bionat product applied throughout the vegetation period delayed the onset of flowering, with the lowest percentage of flowering plants. Consequently, treatments with Bionat are justified at the beginning of the vegetation period, while before and during the flowering period, we recommend the application of extracts based on humic acids or the combination of HA+ESV.

Key words*: Hydrangea hortensis, humic acids, grape seed extract, growth, flowering.*

EFFECTS OF ORGANIC AND MINERAL FERTILIZERS ON GROWTH AND FLOWERING OF YOUNG LAVENDER (*LAVANDULA ANGUSTIFOLIA* MILL.) PLANTS

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Abstract

Although lavender grows in its native environment in rocky and poor soils, various studies have shown that it responds positively to fertilizers, increasing not only the yield but also the quantity and quality of the essential oil. In order to determine the most effective type of fertilizer – organic or mineral, young plants of the Sevtopolis lavender cultivar were tested in a field experiment conducted in the village of Rădulești, Ialomița County, in south-east of Romania. Fertilizers were applied before vegetation, using either yard waste compost or a mineral fertilizer containing 11-11-21 macronutrients and micronutrients. The results showed that in the first year of growth, the mineral fertilized plants had grown less. Floral initiation and flowering period were not influenced by the type of fertilizers. The length of flowering stem and the size of inflorescence were smaller in case of mineral fertilization but the number of inflorescences was significantly lower in lavender plants fertilized with compost.

Key words*: chemical fertilization, Lavandula angustifolia Mill., phenology, sandy soil, yard waste compost.*

MORPHOLOGICAL AND BIOLOGICAL STUDIES ON *IRIS SUAVEOLENS* BOIS. & REUT. IN THE SOUTHERN REGION OF ROMANIA

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Abstract

Many species of genus Iris (Iridaceae family) are appreciated and grown as ornamental plants in botanical, particular and public gardens, in many world regions, because of their flowers and scent. This study has the propose to bring a mofological and biological description of Iris suaveolens Bois. &Reut., as arguments for its ornamental potential. Were investigated the morphological and biological characteristics of the specie, located in the botanical garden of the University of Agricultural Sciences and Veterinary Medicine in Bucharest, Romania. During the study, were analysed the internal and external morphological properties for organs like leaves, scape and flowers. In this direction, were examined microscopical views for cross-sections of the mentioned organs, biometricaly measurements of the main organs in different stages and examination of the vegetative and the flowering phenophases, in the climatic conditions of south Romania. The entire plant keeps its dwarf characteristics, growing no taller than 12 cm. Beside this, long time green leaves, the color, shape and proportion of flowers gives her valuable ornamental potential. The morphological and biological characteristics are similar with the existing descriptions of the specie.

Key words*: Iridaceae, morphology, biology, phenophases, ornamental.*

A CULTURAL LANDSCAPE OF CASTLE AND MANOR PARKS AND GARDENS NEAR AND AROUND BUCHAREST. CASE STUDY OF THE CATARGIU ESTATE IN MAIA

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Abstract

In between the 18th and early 20th century a large number of castles and manors with parks and gardens were built near and around Bucharest, particularly north of the city and near main roads and rivers. Together, these ensembles define a network and cultural landscape of peri-urban noble estates similar to other around big cities in Romania (eg. Cluj-Napoca, Târgu Mureș, Timișoara etc.) or along several historical and commercial routes such as the Prahova or Mureș river valleys or the road from Bucharest to Iași, and, to a certain extent, to other networks of castles and manors with parks and gardens such as those near Paris and the Loire valley, Florence, Rome etc. Either in communism, yet also after 1989, many of these sites were destroyed, their parks were fragmented into multiple properties, their buildings dismantled or left to decay etc. The following paper thus aims to address both the nowadays cultural landscape defined by the remnants of these ancient estates, as well as to emphasize on the importance of one of the oldest manors and its park at Maia.

Key words*: Bucharest, Catargiu, cultural landscapes, garden history, historic monuments, Maia.*

ANATOMICAL RESEARCH OF THE VEGETATIVE BODY OF *IMPATIENS GLANDULIFERA*, AN ORNAMENTAL PLANT THAT HAS BECOME INVASIVE

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Abstract

Ornamental horticulture is a significant contributor to the introduction of invasive plant species, such as Impatiens glandulifera. Native to the temperate and humid regions of Asia, particularly the Himalaya Mountains, the species was first reported in Europe in 1839, introduced for ornamental and nectar-producing purposes. Its presence in Romania dates since 1882. Over the past few decades, the species' invasive nature has led to its inclusion in the List of Invasive Alien Species of Union concern. The existing studies have systematically examined the plant's morphology, habitat requirements, ecology, life cycle, and genetic aspects, emphasizing the traits associated with its high invasive potential. The species exhibits a preference for moist to wet and nutrient-rich soils, commonly found in river valleys and associated riparian habitats. Our research, based on samples collected from Romania, aims to identify and detail the structural features of the vegetative body of Impatiens glandulifera that contribute to its adaptive ability to specific environmental conditions. The anatomical investigations revealed a secondary root and stem structure, enhancing this annual species' robustness and resistance in plant communities.

Key words: *alien plants, structural adaptations, wet environment, environmental requirements.*

TOWARDS SUSTAINABLE URBAN GREEN AREAS: TREE INVENTORY IN GROZĂVEȘTI PARK (BUCHAREST, ROMANIA) FOR REVITALIZATION USING WATER-EFFICIENT APPROACHES

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Abstract

The Romanian law fails to give exact methodologies for the landscape study, planning, and management. Grozăvești Park is part of the strategy for increasing the amount and quality of green areas in District 6 in Bucharest, Romania. It also has the potential of an urban green pole, and will be integrated into the future green corridor of District 6. Considering the specific site conditions, as the metro under the park has water infiltrations, water scarcity and climate changes in Bucharest, there is a need for water-efficient approaches. To assess and protect the current park, comprehensive site analyses were carried out in spring 2024. The vegetation study identified 583 trees with 104 being dead or non-viable, leaving 479 viable trees. From the site analyses, topography and vegetation study, there was a clearer view for what set of recommendations to follow for the revitalization program of the park. The inventory of trees helped to identify young and mature trees that require irrigation and to select appropriate new plant species for efficient water usage.

Key words*: tree inventory, irrigation, green areas, water-efficient approaches, park revitalization.*

EVALUATION OF SOME HYACINTH CULTIVARS UNDER OPEN FIELD CONDITIONS

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Abstract

The hyacinth is one of the most important spring-flowering bulbous plants, extremely appreciated for its beautiful and fragrant flowers in attractive colours, which is used in flowerbeds, borders, small groups, mass plantings of single variety or colour for a greater visual impact in parks and gardens, patio containers, and as cut flowers in bouquets and floral arrangements. It is also grown in pots and forced to bloom indoors in late winter. The aim of the study was to evaluate the growth and flowering characteristics of nine hyacinth cultivars grown in open field conditions. The results revealed that the maximum plant height (31.25 cm), length of the leaves (29.38 cm) and inflorescence length (14.33 cm) were recorded in 'Woodstock'. Among the studied cultivars, 'Blue Jacket' produced the highest number of flowers in inflorescence (44.36), 'Purple Pride' recorded the minimum number of days from planting to flowering (146.16 days) and 'Fondant' had the longest flowering duration (15.12 days).

Key words*: Hyacinthus orientalis, cultivars, growth, flowering.*

THE BEHAVIOR OF SOME DECORATIVE VARIETIES OF *IPOMOEA BATATAS* IN DIFFERENT CULTURE SYSTEMS AND TYPES OF SUBSTRATE

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Abstract

The study was carried out on three ornamental varieties of Ipomoea batatas (`Heart Bronze`, `Black`, `Heart Lime`) grown in the field and in pots. Four types of substrate were used for pot culture: garden soil + peat, garden soil + peat + hydrogel, garden soil + peat + coconut fiber, garden soil + peat + coconut fiber + hydrogel. In field conditions, the plants from the three varieties were distinguished by a larger size than in the pots. Also, in the field, the higher degree of stem branching was recorded in `Black` and the longest branches in `Heart Lime`. The substrate garden soil + peat favored the length of the branches in all the varieties studied. The garden soil + peat + hydrogel at `Heart Lime` and the garden soil + peat + coconut fiber at `Heart Bronze` had a positive effect on the degree of branching. The use of two-factor ANOVA analysis indicates a strong influence of both the variety and the cultivation system on the morphological characters analyzed.

Key words*: morphological characters, ornamental varieties, sweet potato.*

INFLUENCE OF THE ULTRASOUND ON THE SOWING QUALITY OF SNAPDRAGON *(ANTIRRHINUM MAJUS* L.) SEEDS

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Abstract

The main goal of the present study was to establish the effect of ultrasound on the sowing parameters of snapdragon (Antirrhinum majus L.) seeds. Experiments were carried out with three varieties snapdragon. The seeds were sonicated with ultrasound for 2, 4, 6 and 8 minutes. The following parameters were investigated: germination energy, germinability, Mean germination time, Uniformity of germination, length of embryo root and hypocotyls, and fresh weight of the sprouts. The sowing parameters were improved from each duration of ultrasound treatment. The best results for germination and in most of the parameters were found about treatment with 6 minutes. The high correlation between the length of hypocotyls and embryo root and fresh weight was established. Polynomial regression with a high determination coefficient was registered.

Key words*: seeds, energy of germination, germination, mean germination time, seedlings.*

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FROM AGRICULTURAL OASIS TO URBANIZATION: PATH OF OASIS GREEN INFRASTRUCTURES IN BISKRA, ALGERIA

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Abstract

This article explores the dynamic of oasis green infrastructure in Biskra, Algeria, highlighting the crucial role of palm groves in urban sustainability. By revisiting its traditional past and assessing its current impact on urban sustainability, the study highlights the importance of the oasis of Biskra as an essential connector between cultural heritage and contemporary challenges. Analytical methods encompass historical, geographical and environmental assessment approaches to trace the evolution of green infrastructure in the pre-colonial, colonial and post-independence periods. Indicators of surface area and types of green infrastructure were used to quantify changes. The results highlight the capacity of the palm grove to adapt while preserving its crucial role in providing social, economic and environmental services, underlining the environmental issues associated with its degradation. In conclusion, the Biskra palm grove emerges as an essential element of urban sustainability, illustrating the need to preserve this traditional ecosystem. Integrating sustainable practices into palm grove management can strengthen urban resilience and promote a harmonious balance between urbanization and ecological conservation.

Key words*: oases, green infrastructure, palm groves, urban sustainability, biodiversity, cultural heritage, environmental assessment, environmental management.*

THE ROLE OF ORNAMENTAL HORTICULTURE IN PLANT INVASION: A CASE STUDY IN ROMANIA

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Abstract

Ornamental horticulture, a global practice, has significantly contributed to the proliferation of plant invasions on a worldwide scale. The European landscape, perpetually influenced by evolving horticultural trends, has witnessed the introduction of plants from diverse continents. The horticultural industry actively promotes ornamental species that exhibit characteristics traits conducive to their success, such as rapid growth, low maintenance requirements, resilience to local climatic conditions, and resistance to pests and pathogens. However, all these characteristics also ensure their success outside the gardens, so the number of alien plants escaping cultivation in native ecosystems increases from year to year. This study explores the evidence underscoring the fundamental importance of ornamental horticulture in introducing and promoting alien plant species, ultimately leading to their escape into natural ecosystems. In the context of Romania, a comprehensive analysis revealed that 264 ornamental taxa have escaped cultivation, and 30 of them have become invasive. Notably, six taxa, including Ailanthus altissima, Asclepias syriaca, Humulus scandens, Impatiens glandulifera, Ludwigia peploides, and Myriophyllum aquaticum, are of concern to the European Union, warranting special measures for population control and mitigation. This paper seeks to raise awareness about the urgent need for implementing international and European codes of conduct and codes of practice specifically addressing horticulture, ornamental plants, and the management of invasive alien species. The information provided highlights the crucial role of regulatory frameworks in mitigating the unintentional ecological impact of ornamental horticulture. It underscores the importance of collaborative efforts to preserve biodiversity and uphold ecological balance.

Key words*: alien, non-native, decorative plants, floriculture, phytodiversity.*

CADMIUM`S EFFECTS ON GERMINATION AND GROWTH IN *DIANTHUS DELTOIDES*: AN *IN VITRO* CULTURE APPROACH

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Abstract

Heavy metals, such as cadmium, pose a real threat to the health and balance of ecosystems and have a significant impact on organisms and plants. In this research, we focused on the impact of cadmium on germination and growth processes in Dianthus deltoides using cadmium concentrations of 1, 10 and 100 mg/l. The experiment was conducted by growing the plants under in vitro conditions in MS medium supplemented with different cadmium concentrations over three time periods of 7, 14 and 21 days. Results indicate that higher concentrations of cadmium significantly hinder root growth and leaf area, and completely inhibit germination. A specific concentration of 10 mg/l showed a negative impact, not immediately apparent in early analysis but evident after prolonged exposure, with noticeable differences in root growth and leaf area compared to the control group ($p < 0.05$). These findings highlight the plant's response to varying cadmium levels and the importance of exposure duration, underscoring the necessity of understanding and managing the effects of heavy metals like cadmium on plant life.

Key words*: Dianthus deltoides, growth, heavy metals, toxicity.*

INFLUENCE OF COLD TREATMENTS ON FLOWER QUALITY OF BULBOUS ORNAMENTALS

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Abstract

Ornamental plants are among the most extensively grown plants worldwide. They main purpose is for different occasions, like Valentine Day, International women and Mother's Day and bulbous ornamental plants are one of the most important parts of these special moments. The aim of the present research was to find out for how long should be kept under cold conditions in order to produce cut and potted flowers. For this study it was selected the Tulipa gesneriana, Hyacinthus orientalis, and Muscari armeniacum. Different cold treatment types and times were applied to the bulbous plants. The results indicate that the bulbous plants under the influence of 7 weeks cold treatment under controlled temperature proved to be the best and suitable for cut flowers production at all three selected bulbous ornamental plants. In conclusion, the present work could be usefully for cultivation of different ornamental bulbous plants.

Key words*: cold treatment, grape-hyacinth, hyacinth, tulip.*

JUGLANS REGIA: QUALITATIVE AND QUANTITATIVE ANALYSIS BASED ON GIS TECHNOLOGIES

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Abstract

Juglans regia, an allochthonous fruit tree species in Romania, is highly regarded for the nutritional richness of its fruits, the superior quality of its wood, and its ecological contributions as an urban tree. An inventory of trees from urban green spaces in Caransebes was systematically conducted using advanced GIS and GNSS technologies. The gathered data were stored in spatial databases, integrating Cartesian coordinates along with specific characteristic features for each measurement, such as height, diameter, and vitality. Walnut trees have a significant role as contributors to both biodiversity and the ecological balance of the urban landscape in Caransebes. Their multifaceted significance, encompassing nutritional value, wood quality, and ecological benefits, positions Juglans regia as a valuable component of the urban ecosystem. In accordance with the inventory results within the analyzed urban green spaces of Caransebes, the proportion of Juglans regia individuals approximates 9% of the total trees. This highlights the significant presence of walnut trees in the urban landscape.

Key words*: Juglans regia, Biodiversity, GIS, GNSS, Caransebes Urban landscape.*

EXPLORING THE POTENTIAL OF ROMANIAN WALNUTS: A STUDY ON *JUGLANS REGIA* POPULATIONS

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Abstract

The walnut (Juglans regia) is a highly valuable fruit tree species in Romania, occupying extensive areas in plantations and for-ests. Its primary agricultural value comes from the walnut kernel, notable for its rich content of fats, proteins, sugars, essential vitamins, and minerals, thus providing unique nutritional value. This study analyzed four walnut populations in Romania: Gabud, Maldaoci, Stana de Mureș, and Gheja. The research involved identifying differences in bioaccumulation capacity between populations, the study focused on the number of leaflets and leaf area. It also examined the number of nuts per branch, their size, the kernel-to-shell ratio, and other quality characteristics related to their nutritional profiles. The results demonstrate significant evidence that the Gabud and Maldaoci walnut populations possess superior characteristics. The variability in adaptability among different walnut populations underscores the influence of ecological and genetic conditions on the fruits` quantitative and quali-tative traits. Therefore, it is essential to implement a careful strategy in selecting and cultivating native walnut populations, which show improved tolerance to biotic and abiotic factors.

Key words*: Juglans regia, populations, fruit characteristics, nutritional value.*

RESEARCH ON THE EFFECTS OF ABIOTIC STRESS - DROUGHT AND TEMPERATURE IN THE REGULATION OF FLOWERING PERIOD IN *PELARGONIUM*

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Abstract

Plants face a variety of unfavourable environments during vegetative development, for this reason they have had to develop specific defence mechanisms to deal with unsuitable environments. Flowering is a vital developmental stage that can be vulnerable to multiple abiotic stresses. Drought, low temperature and thermal stress can hasten or delay the flowering of plants. This research focuses on how Pelargonium plants combine survival and productivity under drought and extreme temperatures. The present paper presents the study of 10 varieties of pelargonium subjected to variations in temperature and humidity of the culture substrate. The experiment was carried out in the greenhouses of the Vegetable Research and Development Station Buzau and involved biometric determinations for the plants under observation, from the three experimental variants (V1 - control, V2 - plants subjected to thermal stress and V3 - plants subjected to water stress). The results showed that the abiotic stress had an impact on the flowering period, but the plants coped with these inadequate environments. The results were statistically assured.

Key words: *pelargonium, stresses, water, thermal.*

VARIABILITY OF SOME LEAF PARAMETERS IN *LIQUIDAMBAR STYRACIFLUA* L. IN CONDITIONS OF LEAVES CHLOROSIS

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Abstract

The study analyzed the variability of some leaf parameters in the species Liquidambar styraciflua L. under conditions of leaf chlorosis. Leaf samples (normal and chlorotic) were taken from trees in the urban area, Timișoara Municipality. A differentiated variation of the values of the determined leaf parameters was recorded: leaf length, L = 6.15 – 15.00±0.42 cm; scanned leaf area, SLA = 23.68 – 132.48±5.27 cm^2; photosynthetic pigments, Chl = 1.77 – 50.36±3.23, Car = 1.76 – 10.16±0.52; fresh weight, Fw = 0.327 – 3.127±0.127 g; dry weight, Dw = 0.058 – 1.120±0.052 g; specific fresh weight, SFw = 0.0138 – 0.0236±0.0005 g cm^{-2}; specific dry weight, SDw = 0.0024 – 0.0087±0.0003 g cm^{-2}; fresh weight to dry weight ratio, Fw/Dw = 2.6012 – 5.6379±0.1755; specific dry weight to specific fresh weight ratio, SDw/SFw = 0.1774 – 0.3844±0.0119. Correlation of different levels of intensity was recorded between the analyzed parameters, and the regression analysis led to models in the form of equations and graphic form, under conditions of statistical safety ($p<0.001$). According to PCA, distribution diagrams were generated in relation to categories of leaf parameters, in which the main components (PC1, PC2) explained the presence of variance.

Key words: *Liquidambar; leaf chlorosis; models; PCA; photosynthetic pigments; specific dry weight.*

COLOUR PREFERENCE AND RESPONSE OF THRIPS TO DIFFERENT *PETUNIA* VARIETIES IN WESTERN ROMANIA

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Abstract

Thrips are a common pest in most horticultural and ornamental crops. They are particularly common in greenhouses in western Romania. In the present study, we investigated thrips preference for different coloured traps as well as specific structure and abundance in Petunia hybrida varieties in greenhouses. Thrips attraction to colour was assessed using three commercially available coloured sticky traps: yellow, orange and blue. Taxonomically, the diversity of thrips is reflected in the relatively large number of species, identified in Petunia, 6 species: Frankliniella intonsa, Frankliniella occidentalis, Frankliniella schultzei, Scirtothrips dorsalis, Thrips palmi and Thrips tabaci. Of these species, 2 are the most common and abundant: Frankliniella occidentalis (n = 172) and Thrips tabaci (n = 163). In the Petunia varieties, significant differences were observed depending on the colour of the trap, these were found between yellow-blue (p = 0.000) and yellow-orange (p = 0.000) and it is observed that there are no significant differences between blue-orange (p = 0.434). Most of the thrips species were caught with the yellow sticky traps (F = 39.398, p = 0.000<0.05).

Key words*:colour preference, Petunia hybrida, thrips, western Romania.*

THE USE OF NATURAL MATERIALS IN THE DESIGN OF URBAN PLAYGROUNDS: A SUSTAINABLE APPROACH IMPORTANT FOR THE COMMUNITY

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Abstract

Play is essential for the harmonious development of children. Playing outdoors brings with it a multitude of well-known benefits. The presence of playgrounds in the urban environment becomes all the more important as children`s connection with the natural environment becomes increasingly precarious. The appearance of standardized play equipment unfortunately omitted the primary need of children to discover the surrounding environment through challenges. The stereotyped design practiced in the arrangement of play spaces reduces the possibilities of developing a child`s personality and expressing his creativity. The present study aims to address the importance of designing play spaces with a natural concept that will contribute positively to the cognitive development, creative thinking, flexibility, and adaptability of children to various situations. The paper proposes solutions for their correct utilization by providing them with equipment made of carefully selected natural materials and integrated in an appropriate compositional environment. The final goal is to develop some good practice models that can later be implemented in the network of urban spaces intended for children in the city of Iași.

Key words*: community, natural materials, urban playgrounds.*

MISCELLANEOUS

THE MINERAL COMPOSITION OF FLAX, CHIA AND HEMP SEEDS BASED ON X-RAY FLUORESCENCE ANALYSIS

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Abstract

Due to the fact that flax seeds contain the highest amount of essential fatty acids from plants, they are increasingly used as a functional food. Chia seeds are an important source of antioxidants that have beneficial effects on the human body. Hemp seeds are recommended for consumption because they are an excellent source of protein, vitamin E and minerals, and contain all the essential amino acids. The aim of this study is to assess the mineral profile of three types of seeds: flax, chia and hemp. The determination of minerals was made by X-Ray Fluorescence Analyzer. The seeds mineral fingerprints were obtained by using PAST and MVSP programs. The results of the analysis of 12 seeds assortments reveal that these are rich in phytonutrients and minerals (K, Ca, Fe, Mn and Zn). Chia seeds stand out for the highest content of calcium (32.26 g/kg dry weight), while hemp seeds have the greatest content of iron (0.88 g/kg dry weight).

Key words*: superfoods, XRF, nutrients, mathematical model.*

RESEARCH REGARDING CHEMICAL COMPOSITION OF THE ESSENTIAL OIL IN THE *ARTEMISIA ABSINTHIUM* L. (ASTERACEAE) SPECIES FROM ROMANIA

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Abstract

Artemisia absinthium L. (Wormwood) is considered a medicinal plant with antibacterial, antioxidant, anti-inflammatory, antifungal, antimalarial, choleretic action. The analysis of the essential oil has been carried out for stems, leaves and flowers of Artemisia absinthium L. species. The essential oil has been extracted by hydro distillation and analyzed by gas chromatography–mass spectrometry (GC-MS). The main chemical compounds observed in the essential oil were linalyl isovalerate (16.65 %), sabinene (8.90 %), myrcene (8.85 %),geranyl isobutyrate (6.97 %) and β-cymen (6.92 %) in stem, sabinene (23.67 %), myrcene (20.53 %), β-cymen (9.74%) and α-phellandrene (9.23 %) in leaves, linalool (17.97 %), beta-pinene 15.53 %, sabinene (11.18 %) and chrysanthenone (5.48 %) in flowers.

Key words: *Artemisia, essential oil, chromatography.*

WHAT IS THE DIFFERENCE BETWEEN THE INTERNATIONAL, NATIONAL, AND LOCAL METEO STATIONS FOR ONE SPECIFIC ORCHARD? – 100 YEARS OF RECORDS DATABASE ANALYSIS

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Abstract

Temperature is one of the most controversial parameters studied in fruit-growing technologies, considering the direct influence on each growing stage of the plant and not only. Climate change in recent years has led to strategies and specific measures for the management of extreme events. More international meteo stations have continuous data specific to a larger or delimited area. Although, modern technologies require more accurate records as close as possible to the crop, giving a trend to have in each specific point local meteo stations. This study aims to compare the parameters recorded by the international, national, and local meteo stations for a specific orchard located in Bucharest, Romania. The influence of the height of the sensors and extreme values are highlighted also.

Key words*: phenology, extreme events, sensors.*

RESEARCH ON THE FORTIFICATION OF A PASTRY PRODUCT WITH CAULIFLOWER LEAVES POWDER TO INCREASE NUTRITIONAL QUALITY AND ANTIOXIDANT POTENTIAL

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Abstract

Considering the exponential population growth and climate change, it is necessary to develop strategies to produce more foods with high nutritional value and antioxidant capacity, with less waste, using sustainable food production systems. This paper presents the results of the research carried out for the fortification of cakes with cauliflower leaves powder (fortification levels in the range of 4-23%). The fortified cakes have superior sensory qualities and are notable for their protein content (15.16-16.06%), total fiber (6.04-6.92%), total ash (1.89-2.30%), total polyphenols (92.85-157.15 mg GAE/100 g), glucosinolates (117.21-647.87 mmol/100g), α-Tocopherol (0.638-0.682 mg/100 g), β-Carotene (0.24-1.43 mg/100 g), chlorophyll a (1.09-5.75 mg/100 g), chlorophyll b (1.76-10.06 mg/100g). At the same time, the cakes fortified with cauliflower leaves powder have antioxidant potential (215.34-364.23 mg Trolox Equivalents/100 g). Due to their high nutritional value and antioxidant potential, these pastries are beneficial in a healthy diet, but also in the prevention and diet therapy of nutritional deficiencies and diseases caused by oxidative stress.

Key words*: cauliflower, leaves, cake, antioxidant potential.*

RESEARCH ON THE REALIZATION AND TESTING OF THE FERMENTATION CAPACITY OF NATURAL SOURDOUGH FORTIFIED WITH *SPIRULINA* POWDER

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Abstract

Bread is one of the most important product of cereal origin. It was, from ancient times, a worldwide basic food, *and undoubtedly of great value to both human nutrition and the economy. Natural sourdough is a leavening agent that has many benefits, both in terms of bread quality (pleasant taste and aroma, high bioavailability of minerals, etc.) and consumer health. This paper presents the results of the research undertaken for the realization and testing of the fermentation capacity of natural sourdogh fortified with Spirulina powder. For the fortification of natural sourdough with Spirulina powder, two levels of fortification were used (3% and 5%). Natural sourdough fortified with Spirulina (fortification level 5%) has the highest protein content (7.65%), total ash (0.74%), total polyphenols (124.95 mg GAE/100 g), vitamin C (3.40 mg/100 g), mineral elements and the highest antioxidant capacity. The fermentation capacity of this sourdough was tested in the preparation of white bread, with very good results in terms of sensory and physico-chemical qualities.*

Key words*: sourdough, Spirulina, fortification, fermentation, bread.*

ASSESSMENT OF DECORATIVE QUALITIES OF *LYSICHITON CAMTSCHATCENSIS* (L.) SCHOTT. IN THE CONDITIONS OF THE RIGHT-BANK FOREST-STEPPE OF UKRAINE

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Abstract

People's natural attraction to beauty prompts them to decorate water bodies. As a decorative element of the water surface, aquatic flowering plants and the groups formed by them are of the greatest importance. The aim of our research was to find out the decorative properties of the introduced species Lysichiton camtschatcensis (L.) Schott. in the culture conditions of the National Dendrological Park Sofiyivka of the NAS of Ukraine. The decorative characters of plants were evaluated during 2013-2022, according to a scale that includes 20 main features that characterize the general appearance. The highest decorativeness of L. camtschatcensis was recorded according to the characteristics of the duration of flowering (15 points), the strength of the peduncle (10 points), the number of simultaneously open flowers in the inflorescence (12 points), the density (10 points) and the size (5 points) of the inflorescence, the diameter of the flower (5 points), shedding of flower petals (10 points), coloring (15 points) and falling of fruits (10 points). The total score of 141 points (amplitude 40-200) confirms the high decorativeness of L. camtschatcensis in culture conditions.

Key words: *introduction, score of decorativeness, signs of decorativeness, total assessment of decorative characters, water plant.*

STUDIES REGARDING THE BEHAVIOUR OF 'MONEYMAKER' TOMATOES DURING THEIR MARKETING IN FRESH STATE

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Abstract

The consumption of fresh tomatoes, both in Romania and worldwide, has an important place as far as the vegetable category is concerned. This paper presents the results of the studies carried out for the technological and economic characterization of the 'Moneymaker' tomato in the marketing process in fresh state. The duration of maintaining the quality depends on the ripening stage at harvesting and on the temperature level during storage. The limit period for fresh fruits marketing is 7-9 days at a temperature of 23-24^{0}C and of 18-22 days at a temperature of 7-10^{0}C. It was also ascertained that over 97% of the output of the 'Moneymaker' tomato corresponds to the specific quality standard. The fruits harvested in greenhouse or solarium have a homogenous structure by quality categories, the value of quality category coefficient (Q) having values between 2.64 and 2.60.

Key words**:** *postharvest, quality preservation, storage period*

COLD PLASMA TECHNOLOGY IN ENHANCING POST-HARVEST MANAGEMENT AND SECURITY

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Abstract

Plasma technology is a new way to keep agricultural products, such as fruits, vegetables, grains, fresh during storage. It helps prevent the loss after harvesting and keeps the food`s nutritional value. This review analyzes how cold plasma treatment, an environmentally friendly method, is especially useful for perishable fruits and cereal grains that can get damaged by pests and mold. Cold plasma, by its active particles, manages a wide range of germs without harming the food itself, making the method a good alternative to traditional chemical preservatives, where pesticide residues are a huge concern. Plasma technology stops germs development, reduces enzyme activity, and delays the ripening of the produce, significantly extending the life of these products while keeping their taste and nutritional quality intact. Plasma technology could reshape the future storage technologies, offering a new solution to challenges in food security and helping to reduce food waste worldwide. Integrating plasma treatments into existing storage systems could mark a big step forward in managing harvests better, improving the quality, safety, and sustainability of our food supply network.

Key words*: plasma technologies, food quality, agricultural products storage, food safety.*

ASSESSMENT OF NATURAL REGENERATION IN CROPS FROM THE APUSENI MOUNTAINS

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Abstract

The choice of the areas for analysis was made according to a series of relevant principles such as the presence of the seedbed and its nature, the age of the stand to be above the lower limit of 50 years, the consistency of the stand below the value of 0.7. From the analyzes carried out, it was possible to identify the main forest types of influence of major seasonal factors (climatic, geomorphological, pedological) on the establishment and evolution of natural regeneration. It was considered, the synthesis of the way in which these factors imposed a certain distribution of the seed and the importance of this aspect for the structure of the arboretum. From the point of view of the influence of seasonal factors on the settlement, the conducted study indicates good regeneration conditions for the majority resort type 2322 (spruce mountain) correlated with a location on slopes with slight or moderate slopes, sunny exposures at high altitudes and soils with volume middle edaphic.

Key words*: functional group; resort type; forest type; geomorphological form; litter type.*

EVALUATION OF NATIVE BACTERIAL STRAINS AS PLANT GROWTH PROMOTERS FOR GREENHOUSE TOMATOES

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Abstract

Various bacterial strains have been described, over time, as plant growth promoters. The aim of this study was to evaluate the effect of some native bacterial strains applied as soil treatment on tomato seedlings, grown in greenhouse conditions, Giurgiu County. Seven bacterial strains were used in this study, three Bacillus cereus/thuringiensis strains, and one strain of each Acinetobacter guillouiae, Bacillus safensis, Paenibacillus castaneae, and P. lautus species. Certain plant growth parameters were evaluated to compare bacterial effects on the plant growth, such as leaves' chlorophyll content, plant height and stem diameter. Compared to the untreated tomato seedlings, most of the tested bacterial strains improved the plants' growth. Among all the analyzed strains, the highest chlorophyll content was registered in tomato leaves when treated with Acinetobacter guillouiae (2.07 mg/g fresh weight). The obtained results confirm the hypothesis of using selected beneficial bacteria as plant growth promoters in tomato crop. Further evaluations are needed, in order to establish the positive effects of these bacterial inoculants on tomato fruits quality and quantity.

Key words*: beneficial bacteria, native strains, plant growth promoters, seedlings, tomato.*

OPPORTUNITIES AND CHALLENGES IN GROWING *ONCORHYNCHUS MYKISS* (WALBAUM, 1792) - A CASE STUDY

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Abstract

Considering the increasing need to feed humans combined with the depletion of natural resources and global climatic changes, the current study proposes as a solution the growing of rainbow trout in a recirculating aquaculture system, based on certain specific elements (circular tank, UV lamp, filters, etc.). Therefore, the length-weight relationship, growth type, biometric measurements, and body indices were assessed for a population of cultured rainbow trout Oncorhynchus mykiss (Walbaum, 1792). Moreover, water physicochemical parameters were investigated, to reveal the abiotic habitat conditions for this important aquaculture fish species. Aiming to establish the fish`s adaptability to feeding and the impact of living conditions on the gastrointestinal tract, a histological characterization was performed also. After four weeks, the obtained results indicate that biometric data are well within the range of values registered for O. mykiss raised in these growing conditions. The testing of the recirculating aquaculture system showed that after the first four weeks of experiments, the physicochemical parameters of the water changed the well-being of the fish, therefore the system may require an improvement of the filtration mechanism for optimization.

Key words*: recirculating aquaculture system, fish morphology, rainbow trout.*

SPECIFIC CHARACTERISTICS OF STANDS OBTAINED BY TRANSFORMING SILVO-PASTORAL SYSTEMS

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Abstract

The stands obtained through the transformation of silvo-pastoral systems present a series of specific structural, qualitative and synthetic characteristics. These stands are composed of naturally growing tree biogroups which were established from seed in the silvo-pastoral system and bare-root forest seedlings, which were planted in successive stages in the prepared land. From the analysis of horizontal, vertical and three-dimensional profiles made on the experimental surfaces in the studied stand, significant differences among tree height, pruned height, base diameter, crown diameter are found. Also, in some parts of the stand, the consistency index k, varies in the range 0.6 - 0.8, which negatively influences the growth and development process of the stand. It was also found that some of the trees, especially those of the wild cherry (Prunus avium L.), sessile oak (Quercus petraea Liebl), and larch (Larix deciduas Mill.) species, were partially stripped by the herds of deer because the stand was not fenced. Considering the presented aspects, a series of works related to both mixed regenerations and young stands are necessary for the management of these stands.

Key words*: silvo-pastoral system, transformation works, stand, structure, structural characteristics, silvotechnical works.*

UNLOCKING THE POTENTIAL OF ENTOMOPATHOGENIC FUNGI: THE ROLE OF EXUVIAE-SUPPLEMENTED MEDIA IN AUGMENTING BIOLOGICAL ACTIVITY

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Abstract

Entomopathogenic fungi are cultivated for their application in biological pest control, and the optimization of growth media is paramount for their effective production. The use of insect exuviae in media for entomopathogenic fungi has been shown to increase the colony growth as they exhibit an exceptional ability to capitalize on the nutrients available in the insect pest`s body cuticle to invade and colonize the host`s body. In this experimental setup, we utilized exuviae obtained from Tenebrio molitor larvae. Three entomopathogenic fungal isolates with demonstrated pathogenicity against greenhouse whiteflies, tetranychid mites, thrips on vegetables and fruit crops, tephritid fruit flies, white grubs and wireworms were used to test the media. Radial growth rate, conidia production, and germination of isolates were assessed on three culture media: PDA, PDA supplemented with insect exuviae, and ¼ SDAY. The PDA+exuviae improved radial growth rate, germination and conidia yield in all fungal isolates. Several potential applications of culture media are presented, along with an in-depth discussion on the selection of appropriate culture media for the development of effective mycoinsecticides.

Key words*: Entomopathogenic fungi, culture media, insect exuviae.*

THE EFFECT OF OPTIMIZING TECHNOLOGICAL PRACTICES ON THE INCREASE OF BIOMASS PRODUCTION AND CARBON SEQUESTRATION RATE TO *PAULOWNIA* SSP.

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Abstract

The research was carried out within an experimental batch with Paulownia elongata, established in 2019 and the fundamental purpose of the experiment was to verify the influence of the different technological links on increasing the biomass production and the carbon sequestration in young Paulownia plants. The research results demonstrated that choosing an optimum plants density of Paulownia plants at the surface unit the plants benefit from an adequate nutrition space and ensure a balanced nutrition by fertirigation during the phases considered critical for the physiological processes of vegetative growth and development, has an direct effect of stimulating the growth and development of the root system of plants and as a result the plants had a good anchoring in the soil, exploring an increasing volume of soil and realizing significantly higher biomass production and also the carbon sequestrated biomass.

Key words: *biomass production, carbon biomass, fertirigation, Paulownia ssp., plants density.*

RESEARCH ON THE EVOLUTION OF THE PHYSICAL AND MECHANICAL PARAMETERS OF *PAULOWNIA* FIBER UNDER DIFFERENT PLANTING AND FERTILIZATION CONDITIONS

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Abstract

Two factors are directly involved in obtaining superior wood in quantitative and qualitative aspects, respectively an optimal consumption of nutrients (macro and micro-elements) and the optimal plants density at the surface unit. In this context, the present research have been made in order to establish the influence degree of the planting and the fertilization scheme on the physical and mechanical properties that restore the value from the point of view of wood quality to Pauownia ssp. Experimental results showed that best of all the fibers harvested from the experimental variants where the planting schemes of 5x5 m or 6x6 m were used and were administered 40 kg/ha Polyfeed 14-14-28+2MgO+ME by fertirigation during the vegetation period of the plants, the balanced ratio between the nutrients giving to the plants increased resistance to the mechanical factors action.

Key words*: Paulownia ssp.; plants density; fertirigation; fiber's quality; physical parameters; mechanical parameters*

STUDIES ON SPRAYING MACHINES USED IN VITICULTURE

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Abstract

The studies on the spraying machines used in viticulture were carried out at a commercial company in Mehedinţi County, Romania. Depending on the purpose of the treatment and the type of pesticide used, weed control machines and disease and pest control machines are used for mechanized works. The application of pesticides to prevent and control diseases and pests on the vine is an operation that should be carried out based on a carefully prepared plan, strictly observing principles and rules. In the technology of using pesticides for the vine, the method of application aims not only to achieve maximum effectiveness, in terms of controlling diseases and pests, but also of removing the negative effects on it.

Key words*: viticulture, spraying machines, vine*

A REVIEW OF THE TOXICITY OF SOME SPONTANEOUS RANUNCULACEAE FROM THE ROMANIAN FLORA

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Abstract

The family Ranunculaceae (the buttercup family) includes plants that have been used in the past in folk medicine, a few species have pharmaceutical applications, others are ornamental or melliferous plants, but a characteristic of the family is the large number of poisonous species. However, buttercups genera vary in level of toxicity, some, such as Aconitum sp. are highly toxic. In Romania ranunculaceae species are found from the lowlands to the highest mountain areas. Species of Anemone, Caltha, Eranthis, Helleborus, Pulsatilla, are well known plants that flower early in the spring, Ranunculus includes hundreds of weed species with small yellow flowers that are seen throughout the summer, while others such as Aquilegia, Clematis and Delphinium are cultivated in gardens for their ornamental varieties. In the current study, a review is presented, which includes data regarding the use of some ranunculaceae species as poisonous and medicinal plants, and the mode of action of their main toxic compounds.

Key words*: mechanism of toxicity, Ranunculaceae species, toxic compounds, toxic plants, traditional medicine.*

COMPARISON OF THE MICROBIAL COMMUNITY OF ORCHARD SOILS IN THE NORTH-EAST PART OF ROMANIA

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Abstract

Orchard crop species can influence the soil microbial population by releasing root exudates, which are compounds released by plant roots into the soil. Some crop species exude compounds that are more beneficial for certain groups of microbes, while others exude compounds that inhibit the growth of certain groups. Additionally, different crop species have different root systems, which can affect the physical structure of the soil and the availability of water and nutrients, which in turn can influence the soil microbial population. This study aimed to determine the soil microbial diversity of some orchards during different seasons to advance knowledge about the role of microbes in the balance of the orchard ecosystem. The research was carried out in a mixed orchard in Iasi County. Effects of season (i.e. autumn, spring and summer) and land use (apple orchard, plum orchard and cherry orchard) on soil microbial populations and microbial community structures were determined using the Petri dish culture method on different culture media.

Key words*: soil microbiome, soil microbial community, orchard soil.*

VALUABLE COMPOUNDS DERIVED FROM CUCURBITACEAE SUBPRODUCTS AND POTENTIAL WAYS OF ITS VALORIZATION

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Abstract

The paper shows a short documentary study regarding the main valuable compounds that are present in the sub-products resulting in the fruits from the Cucurbitaceae family, with a main accent on Cucurbita sp. type pumpkins. The compound types (polyphenolic compounds, triterpenoids, carotenoidic compounds), extraction methods and the properties of bioproducts obtained in this way (antimicrobial, antitumor properties, sun protection factor) are presented. The most suitable valorization methods for waste biomass generated by Cucurbitaceae fruits are the following: 1) recovery of the carotenoids and polyphenolics compound from these, with potential applications in obtaining different dermato-cosmetical formulations, and 2) obtaining of nanomaterials with silver and gold, mediated by the phyto-compounds recovered by extraction from Cucurbitaceae peels, with potential applications in medicine.

Key words*: antioxidant activity, antimicrobial effect, Cucurbita sp., peel, pumpkin, waste.*

RESEARCH ON THE IMPACT OF CLIMATE CHANGE ON THE ENVIRONMENT: A REVIEW

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Abstract

The climate changes in Romania are part of the global context, considering the regional conditions, with an increasing trend of dry summers. The research topic involves an analysis of the evolution of precipitation and periods of drought in recent years in conjunction with their impact on the environment, under the effect of climate change. The increase in temperature, especially during the vegetation period and the large number of years in which evapotranspiration quantitatively exceeds precipitation, indicate the need for effective measures to regulate the water balance. From the distribution of precipitation in the vegetation periods, it was observed that in the warm period of the year the trend of decrease is greater than in the cold period, which implies a water deficit, now when the plants have the maximum water consumption [21].

Key words*: temperature, soil, precipitation, CO2, drought*

USING CYTOKININ TO ENHANCE ESSENTIAL OIL BIOSYNTHESIS OF TWO ROSE GERANIUM (*PELARGONIUM GRAVEOLENS* L.) VARIETIES: REUNION AND MADAGASCAR-TYPE

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Abstract

Previous studies have demonstrated that exogenous application of phytohormone-based biostimulants and subjecting aromatic plants to environmental stresses improves the biosynthesis of secondary metabolites. This experiment was laid out in a 5×2 factorial design, arranged in a randomised complete block design, and replicated three times to determine the effects of cytokinin (CK) on essential oil biosynthesis. Treatments consisted of four CK (221.6, 443.2, 664.8, 886.4 µM and control); and two varieties of rose geranium (Pelargonium graveolens L.): Reunion-type, and Madagascar-type. Analysis of variance and multivariate analysis showed that CK between 221.6 and 664.8 µM may improve the essential oil biosynthesis for the two varieties. Linalool and geranyl tiglate were increased by CK-886.4 µM following simulated wounding on the Bourbon-type, and Madagascar-type, respectively. This study demonstrated that the Bourbon type remains better than the Madagascar type. The author concludes that the application of CK-664.8 µM closer to harvest may improve the Rhodinol and essential oil biosynthesis of both varieties.

Key words*: biostimulant, citronellol to geraniol ratio, essential oil quality, phytohormone, Rhodinol.*

DYNAMICS OF THE AGE STRUCTURE OF *TULIPA GUERCETORUM* CLOKOV & ZOZ IN THE NATIONAL DENROLOGICAL PARK `SOFIIVKA` OF THE NAS OF UKRAINE

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Abstract

One of the main tasks of botanical gardens and arboretums is the cultivation of rare and endangered species with their subsequent repatriation to their natural habitats to preserve the gene pool of plants of the world flora. The aim of this study was to determine the state of the Tulipa quercetorum Klokov &Zoz coenopopulation in the National Dendrological Park `Sofiyivka` of the National Academy of Sciences of Ukraine during 2020-2023. The age states of individuals of the studied species were identified, the number of their age groups, density of individuals, seed productivity and the state of populations were determined. It was found that the population is characterized by low density and a continuous distribution of plants by age groups. The study of the age structure of Tulipa quercetorum allowed us to classify it as an invasive species, which is in the phase of active introduction into the phytocoenosis, the age spectrum is full-grown, left-handed. It was found that the potential and seed productivity depend on the number of germs and seeds in the fruit.

Key words*: ex situ conservation, rare and endangered plant species, protection, degree of reproduction, spatial distribution.*

A GREEN APPROACH USED FOR HEAVY METALS REMOVAL FROM HUMAN BODY

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Abstract

Recent research has shown that the level of heavy metals in the human body is near 700 times higher than that of our ancestors. It is known that heavy metals do not degrade and are not broken-down by microorganisms and the period for their elimination from the body is very long. They can accumulate in the liver, brain, kidneys, muscles, bones, nails and hair. The World Health Organization highlights the risks of neurological, renal, liver, heart and bone diseases caused by heavy metals. The treatment for most heavy metal intoxications is chelating therapy, which can extend over a very long period of time and is quite costly. However, complementary treatments with medicinal plants have proven helpful to remove heavy metals by intensify diuresis, purifying the blood, through their depurative and hepato-protective role, etc. The paper presents the results of some publications in the field, focusing on the plants role in the human body detox.

Key words*: detoxification, lead, mercury, medicinal plants, morphological characters.*

CITIZENS AND URBAN HORTICULTURE RELATIONSHIP AFTER COVID-19 PANDEMIC: FACTS FROM ROMANIA, GREECE AND CYPRUS

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Abstract

Cities are facing both social and environmental challenges that affect food chain, public health, and social cohesion broadly. Terms such as "Mediterranean Diet", "Urban horticulture", "Organic Farming", "Edible Landscaping" took significant position in everyday life without being sure that we could understand sufficiently their meaning. The pandemic period highlighted how useful tools these would be if we could use them correctly both in planning and development of urban green areas. Urban landscaping and especially gardening and farming connected strongly with social, economic, agricultural, nutritional, environmental, and beautifying parameters through research field in the context of a Doctoral Thesis which took place in Romania, Greece, and Cyprus with main tool a specific questionnaire. The quantitative analysis of the responses is based on a set of 302 variables and aims to elicit information with reference to the knowledge, perception, and experiences of the respondents regarding urban horticulture. The results of the analysis proved that the opinion of the great majority of respondents from Romania, Greece and Cyprus about urban horticulture is positive, with different percentages but for the same reasons.

Key words*: environmental challenges, pandemic Covid-19, social impact, urban horticulture.*

THE INFLUENCE OF TOMATO ROOT EXUDATES ON STRUCTURE AND DIVERSITY OF RHIZOSPHERE COMMUNITIES OF BACTERIA AND FUNGI

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Abstract

The paper aimed to present the results of research carried out on soil microbiota as compared to that colonizing rhizosphere of tomato plants (Solanum lycopersicum L.), FLAVIOLA variety, for assessing the influence of root exudates on composition and abundance of microbial communities in relationship with benefits for plant nutrition and health conferred by their interaction. Cosmopolitan fungal species from genera Fusarium, Penicillium and Humicola, as well as bacteria from genera Bacillus, Pseudomonas, associated with Actinomycetes dominated microbial communities from soil. Rhizosphere communities were dominated by fungal species belonging to genera Aspergillus, Penicillium and Trichoderma accompanied by nematophagous fungi from genus Arthrobotrys. Pseudomonas fluorescens, important for biocontrol of root pathogenic microorganisms, associated with other non-fluorescent species of Pseudomonas were the most abundant in rhizosphere. Rhizosphere effect assessed using as indicator the ratio between the value of total counts of microbes in rhizosphere and in soil (R/S) confirmed the stimulation of microbial abundance and diversity by plant root exudates as compared to soil.

Key words*: rhizosphere effect, tomato roots, biocontrol agents, microbial communities, root exudates.*

THE INFLUENCE OF THE SYNTHETIC MICROBIOMES ON THE CHARACTERISTICS OF BIODIVERSITY AND CARBON SEQUESTRATION IN THE SOIL

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Abstract

The aim of the research was to evaluate the role of the microbial composition of synthetic microbiomes for soil carbon evolution. The microbiomes inoculated into the soil (M1-M9) release exometabolites that influence the transport of nutrients in the soil and the dynamics of the energy potential. Thus, after the inoculation of microbiomes in the soil, the biosynthesized metabolites, the influence on some biological parameters and on the dissolved organic carbon, released after 60 days in the soil, were analyzed. Bacterial microflora growth rate of up to 54% was determined when using M4 and M5 microbiome. Microbiomes M1 and M5 containing bacteria with antagonistic characteristics (Bacillus sp.) and hyperparasitic fungi (Trichoderma sp.) caused up to 32% increases in the microflora. Biomass induced by microbiome M4 reached values up to 354mg C x kg^{-1} soil. Microflora from each microbiome influenced differently the distribution of the fluorescent dissolved organic carbon from soil fulvic subfraction.

Key words*: microbiome; exometabolites; microbial biomass; fulvic acids; biodiversity.*

HORTIVOLTAICS – A ROAD TO GO OR NOT?

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Abstract

Climate change and disputes over land utilization are significant global obstacles. The impact of climate change on agricultural output is evident in the increasing frequency and severity of extreme weather phenomena, coupled with the ongoing escalation of temperature and carbon dioxide levels. At the same time, the increased demand for energy, especially the alternatives and greener forms, is always present. There is hope in the form of agrivoltaic/ hortivoltaic systems, a forward-thinking and truly innovative strategy. These systems integrate solar photovoltaic-based renewable energy generation with agricultural/ horticultural activities by positioning solar panels several meters above the ground. This study aims to review these developed and implemented modern technologies, considering their long-term impact and efficiency. Dynamics on specific parameters such as abiotic stress and streamlined resource consumption, favorable microclimate through the use of transparent photovoltaic panels, monitoring microclimate data, and early diagnosis of nutritional stress are highlighted in the study.

Key words*: photovoltaic panels, solar energy, crop production.*

GREEN AGRICULTURE WITH BLUE RESOURCES: FERTILIZATION BASED ON FISH, ALGAE AND OTHER UNDERVALUED MATERIALS: A REVIEW

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Abstract

In today`s reality, in line with new environmental and climate change policies, organic alternatives are attracting more attention but still not enough, to the detriment of the use of conventional ones. This review provides a comprehensive summary of the current state of research on fertilization with materials of aquatic origin (e.g. algae, fish, mussels, etc. and their by-products and other materials left over from processing industries). Conventional fertilizers, although effective in providing essential plant nutrients, have drawbacks such as soil degradation, water pollution and greenhouse gas emissions. In contrast, organic fertilizers, derived from natural sources such as compost, manure, plant and aquatic residues, offer a more sustainable approach to nutrient management, also contributing to increase soil fertility, microbial activity and carbon sequestration. The nutrient composition of marine residues and the factors enhancing the beneficial effects of fertilizers derived from these residual materials are considered. To summarize, this review emphasises the importance of marine residues as valuable resources for sustainable agriculture and calls for collaborative efforts in research, innovation and policy development to maximize their potential benefits.

Key words*: marine residues, fertilization, organic agriculture, sustainability, circular economy.*

ASSESSING THE INFLUENCE OF 2,4-D AND BAP VARIATIONS ON SOMATIC EMBRYOGENESIS IN SOLANUM TUBEROSUM

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Abstract

Somatic embryogenesis is an artificial process in which a plant or embryo is derived from a single somatic cell, compared to sexual embryogenesis, where the embryo is formed from zygotic cells. These somatic embryos are formed from plant cells that are not normally involved in the development of embryos, for example, tissue from leaves, roots, internodal segments. Somatic embryogenesis in Solanum tubersoum, cultivar `Salad Blue` was achieved using different concentrations of 2,4-dichlorophenoxyacetic acid - 2,4-D (0.5; 0.7 and 1.0 mg/l) in combination with with 6-benzyladenine - BAP (0.1; 0.2 and 0.5 mg/l) on standard MS medium. After induction of somatic embryogenesis, explants were transferred on auxin-free medium for embryo development and maturation.

Key words*: germplasm conservation, in vitro, micropropagation, tissue culture, potato.*

STUDIES REGARDING THE CYTOTOXICITY OF POLYSACCHARIDES ISOLATED FROM INDIGENOUS *PLANTAGO LANCEOLATA*

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Abstract

Polysaccharidic biomaterial obtained from the aqueous extract of indigenous Plantago lanceolata, were subject to the assessment of cytotoxicity in vitro, using two standardized cells lines, respectively Caco2 ATCC-HTB-37 and HUVEC ATCC-CRL-1730. Results obtained from this study revealed that the polysaccharidic fraction is not cytotoxic for normal cell lines take it in the study like HUVEC (IC 50= 512 microg/mL after 24 h of exposure), after 24 and respectively 48 h of exposure, but exerts moderate cytotoxicity against tumour cell lines as Caco2 (IC 50 = 293.5 microg/mL after 24h of exposure). These results recommend this plant as a potential raw material for obtaining a new type of prebiotics, with application in developing new functional foods.

Key words*: indigenous Plantago lanceolata, polysaccharidic biomaterial.*

EVALUATION OF PHOTOSYNTHETIC RATE AND CHLOROPHYLL CONTENT IN FIVE FOREST SPECIES

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Abstract

The study of photosynthetic rates and chlorophyll content in five different tree species (Carpinus betulus, Fraxinus excelsior, Robinia pseudoacacia, Acer campestre and Acer pseudoplatanus) conducted in two different locations, namely in the Iron Gates Natural Park in Moldova Noua (PNPF) and in Timișoara, brings to the fore a detailed analysis of the adaptations and responses of vegetation to environmental variability. Photosynthesis and chlorophyll content are fundamental to understanding ecological processes in forest ecosystems, providing valuable clues to the health and functioning of these complex systems. Across the whole study, Acer pseudoplatanus revealed a significantly higher value of chlorophyll content, followed by Robinia pseudoacacia and Carpinus betulus with similar values and Acer campestre and Fraxinus excelsior with the lowest values, respectively. Acer campestre had a significantly higher photosynthesis rate than the other species, while Acer pseudoplatanus had the lowest values in both locations.

Key words*: Photosynthesis, chlorophyll, Carpinus betulus, Fraxinus excelsior, Robinia pseudoacacia.*

LINGUISTIC DIVERSITY CULTIVATING AGRICULTURAL PROGRESS: THE SIGNIFICANCE OF FOREIGN LANGUAGES IN MODERN AGRICULTURE

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Abstract

In the contemporary landscape of agriculture, the role of foreign languages transcends mere communication; it emerges as an indispensable tool fostering innovation, sustainability, and global collaboration within the agricultural sector. This paper delves into the pivotal significance of embracing diverse languages in modern agricultural practices. Secondly, linguistic proficiency in foreign languages enhances cross-cultural understanding and collaboration. In a multicultural agricultural landscape, respecting and understanding diverse perspectives are catalysts for groundbreaking solutions to complex challenges. In conclusion, the integration of foreign languages into modern agricultural practices is not merely a matter of linguistic proficiency; rather, it is a catalyst for agricultural advancement on a global scale. Embracing linguistic diversity empowers the agricultural community to transcend boundaries, collaborate effectively, and innovate sustainably, thereby shaping a resilient and thriving future for agriculture worldwide.

Key words*: agriculture, foreign languages, progress, practices.*

CHANGES IN MICROBIAL ABUNDANCE OF COMPOST AFTER TREATMENT WITH SPECIFIC ADDITIVES

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Abstract

The present study aimed to follow the change in the microbial community of finished compost after application of different additives. Six variants and one control (C) were prepared: V1-lavender extract, V2- thyme extract, V3- basil extract, V4-mix, V5-microbial fertilizer, V6-mineral fertilizer, V7-Min. + microbial fertilizer. Initial sampling was performed, as well as sampling at days 5, 10, and 15. In V2 V5, V6 and V7, the microbial biota increases with time. On the fifth day, the amounts of microorganisms were highest in the samples with added organic aqueous extracts. On the tenth day, the V7 has the highest microbial abundance. On the fifteenth day, the microbial abundance of V5 is again the lowest. The highest number of microorganisms has V7. The data showed that the water-based organic extracts slightly increased the amount of the microbial community compared to the control. The pure microbial additive has a suppressive effect on the compost microflora, but combined with a mineral additive gives good results and can be used for improvement of compost parameters.

Key words*: microorganisms, compost, composting process, additives.*

IN VITRO GERMINATION AND EARLY SEEDLING DEVELOPMENT OF BASIL (*OCIMUM BASILICUM* L.)

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Abstract

Sweet basil (Ocimum basilicum L) belongs to the Lamiaceae family and it is one of the most worldwide cultivated aromatic herbs. It has a high economic value, due to its uses in traditional medicine, pharmacology, and culinary use, especially in Mediterranean and Asian cuisine. This study aims to assess the in vitro germination capacity of six Romanian varieties of sweet basil 'Macedon', 'Mir rosu', 'Tulsi', 'Patriarhie', 'Bulatum', 'Aromat de Buzău', all of them obtained from The Plant Genetic Resources Bank for Vegetable, Floriculture, Aromatic and Medicinal Plants, Buzău, Romania. Seeds were surface sterilized and then inoculated on 3 variants culture mediums with different composition and concentrations of salts and vitamins

Key words*: in vitro germination, seedling development, aromatic plants, micropropagation.*

USE OF RAPD MARKERS IN THE ASSESSMENT OF SOMACLONAL VARIABILITY INDUCED IN PEPPER CALLUS

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Abstract

Pepper is one of the vegetable species widely cultivated in our country. In the present work, we aimed to subcultivate pepper callus with different tissue origins in the presence of two hormonal balances, both to select proliferative callus lines and for indirect regeneration. Depending on the purpose, there are two options: stability or variability. Stability is desired in micropropagation and genetic engineering, while variability is useful in selection and breeding. The biological material used was callus from 5 local populations of paprika, from different explants (leaves, cotyledons, hypocotyls, meristems) and obtained by repeated subculture. An auxin and a cytokinin have been used as phytohormones for callus induction. Assessment of callus growth in peppers was done by weighing the tissue under sterile conditions. Assessment of callus variability was done in long-term culture of undifferentiated proliferative tissue grown in vitro for 16 months. DNA was isolated from the callus of peppers of different origins and amplified using RAPD primers.

Key words*: RAPD markers, pepper callus, in vitro culture.*

THE BENEFITS OF USING USEFUL MICROORGANISMS IN DROUGHT MITIGATION AND INCREASING SOIL FERTILITY – AN OVERVIEW

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Abstract

In recent decades, drought has represented a major setback for the world's agricultural economy, causing substantial reductions in global agricultural production that threaten the amount of food and food security. Thus, are necessary new alternatives to improve the sustainability of agricultural yield, to cope with various stress factors, including drought and high temperatures. Beneficial microorganisms (fungi, rhizobacteria) play an important role in mitigating the stress caused by drought by modulating the enzymatic and non-enzymatic antioxidant systems of plants and by producing phytohormones, osmolytes which represent the primary mechanisms through which they mitigate the effects of water stress, improving plant growth parameters and soil characteristics. In this study, we presented a review of studies found in the literature regarding the currently known implications of beneficial microorganisms for drought tolerance, including their mechanisms of action and also implication of them in increase of soil fertility.

Key words*: water stress, yield, crops, nutrients, plants.*

THE ROLE OF OLD-GROWTH TREES IN THE COMPOSITIONAL STRUCTURE OF THE `ELYSIAN FIELDS` SITE OF THE `SOFIYIVKA` NATIONAL DENDROLOGICAL PARK AND THE PROBLEMS OF THEIR CONSERVATION AND RESTORATION

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Abstract

The article is devoted to the analysis of the results of the inventory of old-growth trees of the historical site ` Elysian Fields` in the Dendrological Park `Sofiyivka`, which established their current species and quantitative composition, biomorphological parameters, qualitative state, created a map of the geospatial location of old-growth trees, and traced the dynamics of changes in their number and species composition over the past 20 years. Most of the old-growth trees (93.8%) grow in forest-type plantations. Currently, the largest share in the quantitative structure of old-growth trees is represented by (41.2%) Fraxinus excelsior, 14.4% – Tilia cordata, 13.4% – Acer platanoides, 10.3% – Quercus robur, 10.3% – Picea abies, 6.2% – Carpinus betulus, 2.0% – Aesculus hippocastanum, 1.0% – Ginkgo biloba, 1.0% – Pyrus communis. The old trees were grouped according to their functional significance in the compositional structure of the park area. The decorativeness and quality of old-growth trees of the Champs Elysees site were assessed: 20.7% of the surveyed trees are in good condition, 67.1% are in satisfactory condition, and 12.2% are in unsatisfactory condition.

Key words*: old-growth trees, species composition, historical park, landscape, compositional structure of the site.*

PLANT MILK – ALTERNATIVE FOR DAIRY PRODUCTS. RHEOLOGICAL CHARACTERISTICS AND NUTRITIONAL COMPOSITION

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Abstract

The objective of this work was to evaluate the physical, chemical and rheological characteristics of vegetable milk of soybean and almond (homemade prepared, and some types of plant milk purchased from Romanian supermarkets). Vegetable milk is a colloidal solution obtained in the form of water extract from swollen and ground soybeans or other grains (rice, oats, almonds a.o.). The vegetable milk samples (soymilk and almond milk) were prepared from analyzed grains and then a set of chemical and physical characteristics of the milk were assessed. The present study paper investigated the moisture and total dry content substance (TDC), total mineral content - ash content, macronutrients content (fat, protein and carbohydrate content) for soybeans, almonds and vegetable milk samples.

Key words*: soybeans, almonds, plant milk, rheological characterization, moisture, fat, protein content.*

OVERVIEW OF BIOACTIVE COMPOUNDS, BIOLOGICAL PROPERTIES AND THERAPEUTIC EFFECTS OF *PLECTRANTHUS AMBOINICUS*

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Abstract

Plectranthus amboinicus (Lour.) Spreng is a perennial plant belonging to the Lamiaceae family which is found naturally in the tropics and warm regions of Australia, Asia and Africa. This plant has therapeutic properties (antioxidant, anti-inflammatory, antimicrobial, antitumor, antiepileptic and analgesic activities) attributed to its phytochemical compounds (76 volatiles and 30 non-volatile compounds belonging to different classes of phytochemicals such as monoterpenoids, diterpenoids, triterpenoids, sesquiterpenoids, phenolics, flavonoids, esters, alcohols and aldehydes), which are highly valued in the pharmaceutical industry. P. amboinicus is widely used in traditional medicine to treat respiratory, cardiovascular, digestive, urinary and skin conditions such as cold, cough, fever, asthma, constipation, headache and skin diseases. In recent years, due to the increased interest in herbal treatments, numerous research studies have been conducted to document the traditional uses of P. amboinicus and to find new biological effects of this plant. This review provides comprehensive information on the biological properties and bioactive compounds responsible for the therapeutic effects of P. amboinicus.

Keywords: *Indian borage, medicinal plant, phytochemicals, biological activities, pharmacological properties.*

NATURA 2000 HABITATS FROM OLTENIA AFFECTED BY INVASIVE AND POTENTIALLY INVASIVE SPECIES (II)

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Abstract

The present paper is a complex segment of a study aimed at Natura 2000 habitats that are affected by invasive and potentially invasive plants. In the first paper, the forest habitats that have registered changes following the impact of the exercise of this category of plants were presented, and in the present study, the practical Natura 2000 habitats that were affected to a lesser or greater extent by invasive and potential plant species are presented. invasive. These are: 6120 Xeric sand calcareous grasslands, 6240* Sub-pannonic steppic grasslands, 6260* Pannonic sand steppes and 62C0* Ponto-Sarmatic steppes. A summary analysis shows that all analyzed habitats are of community interest, which leads us to say that taking measures to reduce the impact exerted by this category of plants is strictly necessary. The most affected surfaces are those on the periphery of protected areas, where numerous spontaneous species are affected by various phytopathogenic agents and where the zoo-anthropogenic factor makes its presence felt.*

Key words*: grassland habitat, invasive plants, Natura 2000, Oltenia, Romania.*

THE IMPACT OF THE SPECIES *ELODEEA NUTTALLII* ON NATURAL AQUATIC HABITATS IN OLTENIA, ROMANIA

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Abstract

Elodea nuttallii (Planch.) H. St John is a native taxon from North America, which is increasingly widespread in Oltenia, in recent years. It has been known in the flora of Romania since 1993. At the European level, it is on the list of invasive species of interest for the EU. In Oltenia, it prefers aquatic habitats with stagnant or smoothly flowing water. However, it grows in very good conditions and in cloudy waters, where very little light penetrates, a fact that gave this species an advantage compared to the plants it coexists with, greatly reducing their number. Following the research carried out by us, we noticed that in some aquatic habitats in Oltenia this plant registers low dominance abundance indices, but in others it builds up monodominant plant communities or with very few other vascular species, which causes biodiversity to decrease in these places very much. Among the aquatic habitats affected by the presence of the species Elodea nuttallii we mention: 3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation and 3160 Natural dystrophic lakes and ponds.

Key words*: aquatic habitats, Elodea nuttallii, impact, Oltenia, Romania.*

DISTRIBUTION OF SOME NUTRITIVE ELEMENTS IN LEAVES OF DIFFERENT APPLE VARIETIES

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Abstract

Mineral nutrition of fruit trees summarizes the state of knowledge about the mineral nutrition of fruit trees, including apples. The paper presents the results obtained in an experiment regarding the distribution of nutritive elements in apple leaves. Apple varieties used in the experiment were Jonagold Boerekamp, Red Braeburn and Jonagold Novajo. To assess the nutritional status of the studied apple species, leaf samples were collected and analyzed. Those were chemically analyzed, thus the determination of nitrogen was done by the Kjeldhal method, the determination of phosphorus was done colorimetrically, potassium and calcium were determined by using flamephotometry, magnesium, zinc, copper, iron and manganese were determined by using atomic absorption spectrometry. The results of the foliar analysis were statistically interpreted.

Key words: *nutritive elements, leaves, apple varieties.*

MORPHOLOGICAL, ANATOMICAL AND PHYSIOLOGICAL LEAF TRAITS OF PISTACHIO (*PISTACIA VERA* L.) GROWN IN BUCHAREST AREA (ROMANIA)

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Abstract

Pistachio (Pistacia vera L.) is a very important crop species due to its nutrient-rich nuts, as well as its special ability to adapt to climate changes. Micromorphological, anatomical and physiological characteristics have been performed in the leaf taken from the male tree, grown in the Bucharest area (Romania). The samples, represented by mature leaves, were collected in June-July. Leaves are simple, but also trifoliate, with ovate leaflets, with entire margins, glossy. The leaf micromorphology was performed by scanning electron microscopy. For anatomical observations, epidermis was collected from both sides of the leaf, transverse sections were carried out in the leaf lamina and petiole, then observations have been done using light microscopy. Stomata are of anomocytic type, located on both sides of the leaf. The secretory ducts have been identified in the phloem of the vascular bundle of the petiole and in the middle vein of the leaf lamina. The leaf mesophyll is equifacial, having the palisade tissue under both epidermises, and the spongy tissue in situated in the middle area. Physiological indicators can be useful for the characterization of the pistachio adaptation mechanisms in the resilience integrated framework.

Key words*: Pistacia vera, anatomy, morphology, physiology.*

STUDY ON POPULATION INVOLVEMENT IN WASTE MANAGEMENT

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Abstract

The pollution is caused by the lack of ecological education of the population but also by the weak involvement of the authorities in this problem. Some studies show that the amount of municipal waste per capita increased in some countries such as Germany, Greece, Malta and decreased in Romania, Bulgaria, Spain and Hungary. In this study we applied a questionnaire that included questions about the environmental attitude and waste management and analyzed the answers given by the respondents. Waste resulting from human activities has a negative impact on the environment, and the population must understand this and reduce the amount of waste. Natural and legal persons have the obligation to collect selectively and get involved in the recycling process. Understanding the recycling process by the public is very important to protect the environment.

Key words*: waste management, environment protection, pollution.*

WATER IN BIOLOGICAL SYSTEMS - A CHALLENGE FOR PLANT PHYSIOLOGY AND BIOPHYSICS WITHIN A CLIMATE CHANGE PERSPECTIVE

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Abstract

As the world handles with the multifaceted challenges of climate change, understanding the profound implications of water in plant system is of high interest. The aim of this study was to explore the challenges posed by water in plant physiology under climate change context. Three searches were performed in the Web of Science database using three combination of keywords "water and plant physiology", water and biophysics" and "water and climate change". Full records were assessed following author keywords and keywords plus. The database was refined by quick filters "review articles" from the last 5 years. The results from the first search highlight drought, in a share of 16%, as the most studied abiotic stress on plants (32%) and overall stress (30%), root zone (13%) and salinity effects within 13%. The second assessment brings an increased interest upon mathematical modelling (26%) and different elements dynamics (17%). The third specific search points out the present interest in genetic analysis (18%) for assessing stress tolerance (12%) that impact plant physiology (6%), stomata (6%) and chlorophyll content (3%). The perspectives for future research must be concentrated to increase especially the fields with low percentages.

Key words*: abiotic stress, crop growth, dynamics, seed, stress response.*

NETTLE PLANTS FINGERPRINT BASED ON XRF ANALYSIS

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Abstract

Stinging nettle (Urtica dioica L) is a perennial crop well adapted to a varied range of environmental conditions. The cultivation of nettle could help meet the high demand of nutritious plants, for food, nutraceuticals and as a substitute for artificial fibers for different industries. Nettles are well known as hyperaccumulators of heavy metals, growing as weed, worldwide, which makes them suitable for the present study. The aim of this study is to present the possibility of using X-ray fluorescence (XRF) spectrometry as a valuable tool to create fingerprints to evaluate the environmental pollution of a specific area using soil and nettle plants samples, as well as verifying the quality of plants utilized as potential food sources. Nettle plants and soil samples were randomly collected from different areas of Romania, dried under controlled environment, then prepared for XRF Analysis. All samples were analyzed in triplicate using Hitachi X-MET8000 XRF analyzer and the results were statistically evaluated using statistical programs. The results show the possibility to obtain valuable fingerprints based on the elemental composition correlated to the geographical origins of plants.

Key words*: Urtica dioica, heavy metals, food safety, mathematical models.*

PRELIMINARY RESULTS REGARDING THE EVOLUTION OF SMALL POTATO MERISTEMATIC EXPLANTS (0.1-0.2 MM)

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Abstract

This study has as its main objective the meristematic regeneration starting from small explants (0.1-0.2) to ensure viral eradication in potato culture. The experiment is monofactorial, the analyzed factor being the variety with 4 graduations: a1: Azaria; a2: Braşov; a3: Cosiana; a4: Cezarina (as control). For Azaria, Brasovia and Cosiana cultivars, the DAS-ELISA test was performed from potato tuber sprouts to determine the viral infection of these cultivars. Thus, the Cosiana variety presented the highest viral load, according DAS-Elisa test, 3 viruses specific to potato culture were identified: PVS, PVM and PLRV; this is followed by the Brasovia variety, which presented the PVS and PVM viruses, and for Azaria variety, the existence of PVS virus was observed. The inability to guarantee complete elimination of viral particles, especially in cases with mixed infections, remains a limitation for these methods based on meristem cultures. After each pass of the meristems, the statistical analysis was performed, regarding the regeneration of the meristems, finding after each pass the decrease in the viability of the meristems, the reason being the reduced sizes of the meristems.

Key words*: potato, virus, in vitro, meristem, regeneration.*

ALLELOPATHIC EFFECT OF THE ESSENTIAL OIL OBTAINED FROM HYSSOP (*HYSSOPUS OFFICINALIS* L., FAM. LAMIACEAE)

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Abstract

The paper aimed to present the evaluation of the allelopathic effect of the essential oil (EO) of hyssop (Hyssopus officinalis L.) obtained from a new Romanian variety ('Catalina' variety), on seed germination and seedling growth. As biological material, seeds from two weed species were used: green foxtail (Setaria viridis), Johnson grass (Sorghum halepense) and two vegetable species: lettuce ('May King' variety) and spinach ('Matador' variety). The main compounds identified in EO were: cis-pinocamphone (34.57%), trans-pinocamphone (13.73%), along with ß-pinene (13.32%), β-phellandrene (9.51%) and germacrene-D (5.38%). The obtained results demonstrated that EO had an allelopathic effect, inhibiting/stimulating seed germination and subsequent seedling development. However, the concentrations that showed inhibition/stimulation effect were different depending on the seed species tested. The study demonstrated possible allelopathic effects of EO from hyssop 'Cătălina', on weed and vegetable seed germination. The obtained results can be used in the future, for the development of commercial products with bioherbicidal action, but additionally, thorough research is needed regarding the mechanism of action, EO encapsulation, testing in field conditions, etc.

Key words*: EO, Hyssopus officinalis, 'Catalina' variety, chemical composition, germination and seedling growth.*

PROTECTED AREAS AND LOCAL COMMUNITIES' FOOD PRACTICES IN STRANDZA NATURE PARK, BULGARIA (A CASE STUDY OF PLANT AND FISH DIETARY MODELS)

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Abstract

The poster will present the results of the pilot study of the nutrition and dietary practices of the local community in the Black Sea small town of Ahtopol, situated in the footsteps of Strandza Mountain and near Veleka River in the Nature Park Strandzha. Tourism is one of the main economic and social activities. Our presentation will show two types of uses of natural resources in the dietary practices of the local people in comparison with the food practices of the tourists during the summer season. The biocultural approach of analysis will show the results of the plant, fish and see-fruit combinations in the traditional and contemporary home-made food and gardening of the local people in contrast to the recipes for the tourist. The poster outlines the good practices of the sustainable development model and the strategies for protecting not only the biodiversity but also the cultural diversity of the local communities. Acknowledgements. This study is financed by the European Union – Next Generation EU, through the National Recovery and Resilience Plan of the Republic of Bulgaria, project № BG-RRP-2.004-0001-C01.

Key words*: food and diets, urban gardening, protected areas, local communities, bioculutral diversity.*

MICROBIOLOGICAL AND OXIDATIVE STABILITY OF WHITE WINES DURING TECHNOLOGICAL PROCESS

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Abstract

Oxidation and the capacity for sufficient ageing potential of white wines are constant problems for winemakers worldwide. The article analyzes the correlation between the microbiological and oxidative stability of white wines and the main redox processes occurring in the technological stages and aging of the wines. In micro-winery TUM conditions, parallel and spontaneous development of several redox processes and their impact on the quality, microbiological and oxidative stability of white wines were examined. As a result, the developed technological scheme has managed to provide a solution that is effective in order to properly control the oxidation process and preserv the white wine quality. The reduction of additive and subtractive technological interventions, of the amounts of adjuvants (sulphurous anhydride) is essential for the production of organic wines.

Key words*: white wines, sulfur dioxide, redox processes, oxygen, quality.*

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