SCIENTIFIC CONFERENCE

“Challenges in modern agricultural production”

BOOK OF ABSTRACTS

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UNIVERSITY "SS. CYRIL AND METHODIUS " – SKOPJE
INSTITUTE OF AGRICULTURE – SKOPJE

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BOOK OF ABSTRACTS

Skopje, December 2014

Dear Collegues,

In this Book of Abstracts you will find 66 titles divided in: plenary lectures and 5 sections (section 1 - plant production, section 2 - sustainable agriculture, section 3 - plant protection and food safety, section 4 - enviromental protection and natural resources managament and section 5 - rural development and agro-economy).

Looking forward to recive the full papers of your accepted abstracts. Accepted full papers will be published in the Book of proceedings from the Scientific Conference.

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Gordana Glatkova PhD
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CONTENT

PLENARY LECTURES

CONTRIBUTIONS OF RICE BREEDING ACTIVITIES TO RICE PRODUCTION AND YIELD INCREASES IN TURKEY

Halil SÜREK

Trakya Agricultural Research Institute, Edirne, Turkey
e-mail: surekhalil55@gmail.com

Abstract

The objectives of rice breeding activities in Turkey were to develop high yielding varieties with short plant height, lodging resistant for mechanical harvest, resistance to disease and pests, cold tolerant at different growing stages, early or medium mutation (120-140 days), long and translucent grain types, high milled rice yield, low or medium amilose content and low to medium gelatinization temperature and good response to nitrogen fertilizer. Also, maintain of the purity and the seed production of released varieties is among the breeding goals.

Rice breeding program started at Thrace Agricultural Research Institute in Turkey in 1965. As a result of breeding programme, 12 rice varieties were developed using introduction method, 39 varieties were bred utilising crossing method, and 2 varieties through mutation breeding, total of 53 rice varieties were developed up to now in Turkey. The most recent developed new varieties have high yield potential, short plant height, short-narrow and erect type leaves, and high harvest index. The results of a research done to compare new developed varieties with local and introduced varieties showed that the average rice yield increased annually around 53 kg ha^{-1}, equivalent to 0,9% per year between 1980 and 2000.

The most popular local developed rice variety in Turkey is Osmancık-97, it is grown on 73% of total 110 000 ha rice cultivating area in 2013. It has high rice and milled yield potential, tolerance to cold and blast disease, long and translucent grain, good eating quality for Turkish consumer. Osmancık-97 is well known not only in Turkey, but also in other countries. It is also cultivated in the neighbouring countries such as Bulgaria, Russia, Ukraine, Greece etc. The rice farmers can harvest 10 to 12 ton rice yield using the other new developed high yielding varieties such as Kızıltan, Halilbey, Çakmak, Yatkın, and Sürek M711 etc. in recent years.

After the successful results of rice breeding activities obtained in re-

cent years, the average rice yield increased to more than 8 ton per ha in 2013 from 4.5 ton per ha in 1980 and all introduced and local old varieties at the moment are replaced by local developed new varieties in Turkey. This has made rice farming profitable, therefore, the rice growing area and total rice production increased at the same time. Turkey has become 100% self-sufficient in variety usage and providing certified seeds for rice cultivation.

Key words: Rice *(Oryza sativa L.)*, rice breeding, rice production, rice variety, rice yield.

BIOCONTROL OF SOILBORNE PLANT PATHOGENIC FUNGI

Mladen NAYDENOV

Agricultural university of Plovdiv, Bulgaria
e-mail: mladenay@gmail.com

Abstract

Soilborne plant pathogenic fungi can cause serious losses to farmers. For protecting the plants, growers usually rely on chemical pesticides. The public concern related to the harmful effects of chemical pesticides on the environment and human health requires alternative, nontoxic products and approaches. The need for sustainable, healthy food production has enhanced the search for safer, environmental-friendly control alternatives. Biological control of plant pathogens proves to be the best alternative for plant disease control.

The most common approach to biological control consists of screening of active antagonistic microorganisms, studying their modes of action and formulating of biological control products.

The paper describes the current status of research and application of biological control of soilborne plant pathogenic fungi, including the involvement of various groups of microorganisms and the most important key mechanisms of biocontrol.

Despite the progress made in understanding the mechanisms of action of biocontrol agents, practical field application often fails.

The paper outlines the future directions that might lead to the development and successful application of more effective biological control products.

Key words: biocontrol, soilborne plant pathogens, mode of biocontrol action, application of biocontrol products

GENETIC RESOURCES FOR FOOD AND AGRICULTURE - FROM CONSERVATION TO SUSTAINABLE USE

Gordana ĐURIĆ*[1,2], Nikola MIĆIĆ[2,1]

[1] Genetic Resources Institute, Banja Luka, BiH, Republika Srpska
[2] Agricultural faculty, Banja Luka, BiH, Republika Srpska
e-mail: gordana.djuric@griunibl.rs.ba

Abstract

Agrobiodiversity is among the most important resources of planet Earth. Crops, livestock, aquatic organisms, forest trees, microorganisms and invertebrates form a network of biodiversity depends on which food production in the world. Biodiversity is essential to any plants pollinated by insects, bacteria used to make cheese, various breeds of cattle used in harsh environments, or thousands of varieties that provide food security around the world. When these resources are eroding, humanity is losing potential ways to adapt agriculture to new socio - economic and environmental conditions. Maintenance of biodiversity for food and agriculture is a global responsibility. However, genetic diversity is lost at an alarming rate. With climate change, conservation and sustainable use of genetic diversity has become more critical than ever. The challenge of conservation and sustainable use of genetic resources is present on all continents and ecosystems and requires broad-based response. The best prospect to recover, maintain, and unleash the potential of agricultural biodiversity will be provided by an integrated and holistic strategy. This approach should achieve in particular the following: sustainable use of genetic resources; scientific and technological development; co-ordination, harmonisation and networking and institutional and legal framework. The conservation and sustainable use of genetic resources in agriculture also forms part of a wider effort to promote innovative practices and to contribute to smart, sustainable growth. Putting in place a comprehensive and holistic approach on agricultural genetic resources would provide a considerable contribution to enhance sustainability and economic viability across different agricultural systems as well as the whole food chain.

Key words: agrobiodiversity, food security, hollistic approach

MACEDONIAN SOIL INFORMATION SYSTEM

Dusko MUKAETOV*[1], Marjan ANDREEVSKI[1], Josif MITRIKESKI[2], Gjorgi FILIPOVSKI[3], Tatjana MITKOVA, Mile MARKOSKI, Kole VASILEVSKI[4], Tijana SEKULOSKA[1], Milena MANEVSKA[1],

[1] Institute of Agriculture – University "Ss Cyril and Methodius"
[2] Faculty of agricultural sciences and food – "Ss Cyril and Methodius"
[3] Macedonian Academy of Sciences and Arts
[4] Faculty of Forestry - "Ss Cyril and Methodius"
e-mail: d.mukaetov@zeminst.edu.mk

Abstract

Soil is a complex system which is a product of interaction of different pedogenetic factors (relief, geology, climate, vegetation and human impact) over time. For better understanding of the processes of its formation and the distribution of its properties over time and space, an integration of all available data related to soil and soil formation have to be integrated into an mutual integrated digital data base. This will enable application of modern techniques of analysis and planning the future activities towards designing the appropriate tools, methods of modeling and monitoring framework.

Creation of soil data base in digital is a first step towards inventory of soil as a very important natural resource and identification and quantification of all types of land degradation.

The research activities encompasses compilation of a set of existing soil data, its evaluation and transformation into digital format. More than 140 soil maps were digitized and aprox. 5000 soil legacy data were integrated into digital soil data base which have been designed and constructed to satisfy the needs of the upcoming digital soil mapping activities.

Key words: soil map, digital data base, soil profiles, land, degradation

NEW TRENDS AND THE CURRENT STATE OF CROATIAN VITICULTURE

Bernard KOZINA

Faculty of Agriculture, Universitity of Zagreb, Croatia
e-mail: bkozina@agr.hr

Abstract

In the past decade viticulture in Croatia has undergone a significant change, on the one hand as a result of the process of the Croatian accession to the European Union, on the other hand as a result of strong general changes in the economy and economic policy in the country. The former socialized systems as carriers of viticulture and wine production were fully switched to private ownership. At the same time, private producers from the time of former Yugoslavia, after the end of the Patriotic War start a significant expansion of its production capacity and start to become increasingly important players in the domestic market. Start of negotiations on Croatian accession to the EU, especially the negotiation activities in the area of agricultural sector, marked the beginning of strong state incentives raising vineyards. In this content the Croatian Government make an Action Plan to raising and spreading vineyards and orchards, which by the end of 2010 should raise at least 5,000 hectares of vineyards. On the territory of the Croatian coast, especially in Dalmatia, we started winning Mediterranean karst and underbrush, the nature of forest terrain and converting them into surface suitable for growing grapes. In the five-year period we managed to prepare and raise about 1,200 hectares of vineyards in the newly conquered areas which today officially called "meliorated debris". On traditional vineyard site in the same period there have been approximately another 3,000 ha the plan is almost achieved. However, despite all of Croatia the period from year 2000 has been a decline of the vineyard area of approximately 28,000 ha to 22,000 ha. On the question how to stop any further decline of the vine surface and how to position the Croatian Viticulture and Enology in the circumstances as a new member of the EU, the answers will obviously have to be to look for and give a new generation of entrepreneurs in viticulture and oenology.

Key words: viticulture, enology, new trends

PLANT PRODUCTION

A RESEARCH ON YIELD AND YIELD COMPONENTS OF SOME BARLEY CULTIVARS

Resat DEGIRMENCI*, Huseyin VAROGLU, Suleyman SERINAY

The Ministry of Food, Agriculture and Energy, Agriculture Research Institute, Cyprus
email: rdeirmenci@yahoo.com

Abstract

This study was conducted at the field of Agriculture Research Institute of Guzelyurt, Cyprus in 2009-10 growing season. The experimental design was a randomized complete block with three replication and five Barley Cultivars (Gydrea, Otis, Nure, Pewter, Athenais and Lysee) were used in the experiment. According to the results of analysis, significant statistical differences have been determined among cultivars. In this research, plant height, kernel number per spike, kernel weight per spike, spike number per m^2, 1000-kernel weight, crude protein rate and grain yield of the cultivars ranged between 75,56-106,78 cm, 17,80-39,70 number, 0,59-1,27 gr, 204-412 number, 27,90-38,13 gr, %10,41-15,08, 159-452 kg/da respectlively.

Key words: Barley, cultivars, yield and yield components

AGROBIOLOGICAL, TECHNOLOGICAL AND ECONOMIC EVALUATION OF 'MERLOT' CLONES IN SUBREGION PODGORICA

Vesna MARAŠ*, Vesna KODŽULOVIĆ, Milena MUGOŠA, Jovana RAIČEVIĆ, Sanja ŠUĆUR, Anita GAZIVODA

"13. jul Plantaže", Put Radomira Ivanovića 2, Podgorica, Montenegro
email: vesnam@t-com.me

Abstract

The viticulture and wine production in Montenegro has a very long tradition and besides breeding of autochthonous (‚Vranac', ‚Kratošija', ‚Krstač' i ‚Žižak'), international grapevine varieties are also cultivated what led to considerable development and improvement of viticulture and winemaking sector. The objective of this work was to assess and characterize agrobiological characteristics and oenological potential of clones of international grapevine variety ‚Merlot', which can be achieved in agro-ecological conditions of sub region Podgorica. In paper are shown three-year results of investigating agrobiological, technological and economic characteristics of ‚Merlot' clones (VCR–1, ISV FV4 and VCR-101). The highest yield and sugar content was measured in clone VCR – 101. Wine of this clone had the highest extract and anthocyanins content, great colour intensity with strong flower aroma, which are good for medium-long term aging. The lowest yield of grape per vine was reached with clone ISV FV4, which wine had the lowest alcohol, polyphenol and extract content. Wine produced of clone VCR – 1 had the highest alcohol and polyphenol content. Based on the results of examined clones of grapevine variety ‚Merlot' (VCR – 1, ISV FV4 and VCR – 101) it can be concluded that they have achieved great results in vineyards of subregion Podgorica and can be recommended for futher breeding and expansion in this subregion.

Key words: clone,'Merlot', agrobiological characteristics, oenological potential

INFLUENCE OF YEAST STRAINS ON THE COMPOSITION AND CHARACTERISTICS OF RED WINES

Tatyana YONCHEVA

Institute of Viticulture and Enology, 5800 Pleven, Bulgaria, 1 "Kala tepe" str.
email: t_ion@abv.bg

Abstract

The influence of 4 strains of wine yeasts of *Saccharomyces cerevisiae* species on the chemical composition and sensory characteristics of wines from varieties Gamza, Pinot Noir, Merlot and Cabernet Sauvignon was studied. Under created experimental conditions strains *Badachoni, A-30, 24-6* and *8-11* had a good fermentation activity, beginning and conducting the fermentation process at a different rate and intensity, depending on the composition of grape pomace. Differences in the composition and properties of the obtained experimental wines were found that were due to varietal characteristics and yeast strain specificity. More significant was the effect of yeast on the amount of esters, aldehydes and higher alcohols synthesized during the fermentation as well as on the content of organic acids in the samples. For obtaining a red wines with an optimal combination of parameters of chemical composition, color characteristics and organoleptic profile as most suitable were indicated the strains: for variety Gamza – *Badachoni*, for Pinot Noir - *A-30*, for Merlot – *24-6*, for Cabernet Sauvignon – *8-11*.

Key words: *Saccharomyces cerevisiae*, alcoholic fermentation, wine, chemical composition, color characteristics, organoleptic profile.

POLLEN EXINE MORPHOLOGY OF APOPRAT GRAPE VINES WITH FUNCTIONALLY FEMALE FLOWERS TYPE

Tatjana JOVANOVIĆ-CVETKOVIĆ[1], Nikola MIĆIĆ[1], Dragan NIKOLIĆ[2], Nada KORAĆ, Dragoslav IVANIŠEVIĆ

[1] University in Banja Luka, Faculty of Agriculture
[2] Univeristy in Belgrade, Faculty of agriculture Zemun
[3] Univeristy in Novi Sad, Faculty of agriculture
email: nikmicic@yahoo.com

Abstract

Vine varieties with functionally female flowers are characterized by male sterility, and therefore crossfertilization is needed. Research under scaning electron microscope (SEM) show that in these varieties pollen grains with no openings for germination are formed - apoporate pollen grains. Varieties with functionally female flowers are present in the Western Balkan region, but morphology of their pollen was never analyzed under SEM. In this paper, we studied the morphology and ornamentation of exine of pollen vine varieties with functionally female flowers: Blatina, Bagrina, Drenak crveni and Čauš.

Samples for pollen analysis were taken from the production vineyards of Aluminijumski kombinat Mostar, and the vine collection of the Faculty of Agriculture in Novi Sad. Preparation of preparats for observation under SEM (JEOL JSM-6390LV) was performed by steaming pollen with 20 nm thick golden coat, and recording was done with magnification 500 - 15,000X in the laboratory of Electron Microscopy, Faculty of Agriculture, University of Belgrade.

The research results show that the pollen grains of all four tested varieties at the time of release from the anthers (anthers dusting) were visually "collapsed", i.e. they have clearly expressed dent which covers ⅓ to ½ of the pollen grain. By hydration these pollen grains absorb the liquid and receive approximately globular shape in the range of 22 - 30μm. There are no germination colp present on the pollen grains. Exine of all four varieties is tectact type with noticeable differences in appearance of tectact openings on the surface, while irregular and initially indicated reticular folds can be observed only in those positions on pollen grains where tectact openings are extremely small.

Size, representation and distribution of tectact openings vary on polen grains and are not specific for the variety, which means that detrmination of varieties on the basis of exine ornamentation is not possible.

Key words: male sterility, autochtonos vine variety

REPRODUCTIVE BIOLOGY AS OPEN QUESTION OF FRUIT GROWING SYSTEM INTENSIFICATION

Nikola MIĆIĆ*, Gordana ĐURIĆ, Miljan CVETKOVIĆ

University in Banja Luka, Faculty of Agriculture
email:. gordana.djuric@griunibl.rs.ba

Abstract

The genetic potential of cultivated fruit species and varieties is more greater than what is now being realized as the average yield in the given production conditions.Basic principles of cropping system (combination of cultivar/rootstock: training form : density) were brought to the level of high agro and pomotechnical intensivity and sustainability. Limiting environmental factors are practically put under control in high density plantations.

And finally, after 22 world congresses on plant pollination, it was learned that only open questions from reproductive biology are standing in the way of higher realization of the genetic potential of plants, and whereby the fruit. So, even though the science had fully realized pollination process of plants and at the molecular level may control these processes, it was irrefutably determined that in the intensive and highly intensive growing systems over 40% of potential yield is lost as the result of inadequately designed and, according to given production conditions, unresolved issues in the field of reproductive biology.

Therefore, the International Society for Reproductive Biology, established in 1995, organized the first international conference in 2008, entitled "The role of reproductive biology in biodiversity conservation", and in 2010 the First World Congress on the reproductive biology of plants, Agra – India, as well as the II World Congress in 2012 in Pecs - Hungary.

Through these activities a complex of open and multidisciplinary issues that should be covered by the scientific field of reproductive plant biology is defined in order to maximize the realization of the genetic potential of crops in given production conditions.

This paper presents the basic and globally opened issues of reproductive plant biology, as well as research results on the initiation of differentiation of generative buds, and the constitution of the male and female gametophyte in apples, plums and cherries, that are being carried out in the Institute of Horticulture, Faculty of Agriculture, University of Banja Luka.

Key words: reproductive plant biology, differentiation of generative buds, gametophyte, fruit system intensifiction

THE INFLUENCE OF FOLIAR FERTILIZING WITH ORGANIC FERTILIZERS ON CABBAGE (Brassica oleracea L.) YIELD IN THE GEVGELIJA AREA

Petar PETROV*, Mile MARKOSKI, Tatjana MITKOVA

University "Ss. Cyril and Methodius" Faculty of Agricultural Sciences and Food - Skopje
email: petrovpetar2012@gmail.com

Abstract

The basic goal of this research is to determine the influence of foliar fertilization with organic fertilizers over the cabbage yield in the Gevgelija region. The experiment was set according to random block-system, on fluvisol soil with high concentration of available forms of nitrogen, phosphorus and potassium. It was performed during the vegetation period of 2013, on the territory of the village of Negorci, near Gevegelija, with five variants and three repetitions in fifteen rows. Each variant involves 180 plants in total. The experiment involves the following variants: 1. Control (Non-fertilized); 2. Bioflor; 3. Ingrasamant foliar, 4. Humustim and 5. Rhizoactive. During the vegetation period, total of four treatments have been performed by foliar feeding with 0.4% solution of the above given fertilizers. Following the cabbage harvest and the measurements of the cabbage yield, it was concluded that the foliar fertilizing and the high concentration of available forms of nitrogen, phosphorus and potassium have positive effects over the quantity of the cabbage yield in all variants. The highest yield of 92,41 t/ha was achieved in the variant no. 5, Rhizoactive.

Key words: cabbage, organic fertilizers, foliar fertilizing, fluvisol soil

PERFORMANCE OF WILD PEACH SEEDLINGS IN REPLANT CONDITIONS

Toso ARSOV*[1], Marjan KIPRIJANOVSKI[1], Viktor GJAMOVSKI[2]

[1] University "Ss. Cyril and Methodius" Faculty of Agricultural Sciences and Food – Skopje
[2] University "Ss. Cyril and Methodius" Institute of Agricultural – Skopje
email: arsovtose@yahoo.com

Abstract

When an orchard is removed and the same kind of orchard is replanted in short order, without fumigation, the replanted orchard frequently grows poorly exhibiting stunting and yellowing in an uneven pattern across the field. This can be due to several biotic and a biotic factors. In Republic of Macedonia more than 95% of peach are replanted on wild peach rootstock. Although the occurrence of soil/pests pathogens in particular peach growing areas were not well studied, can point out that wild peach rootstock is quite sensitive to the "rejection component" of the replant problem.

For this porpoise biological testing of the wild peach seedlings were conducted using "Replant Problem Soil"(RPS), "Virgin Soil," or a better term "Non Replant Problem Soil" (NRPS) and treated "Replant Problem Soil" with 30 tones of cattle manure and 1 tone of elementary sulfur per hectare. The study has been performed during two consecutive years 1996 and 1997. The following parameters were investigated: vegetative growing parameters expressed trough diameter of the seedlings and its length, fresh and dry mass of the upper part of the seedlings and root system.

According to the diameter of the trunk, a seedling grown on NRPS has the greater value for those grown on RPS for 2.4 times. Satisfactory results for this parameter was achieved at seedlings grown on treated RPS. In general based on the vigorousness of the seedlings it can be concluded that RPS seriously affect on survival and development of the wild peach seedlings. As a measure for solving this problem treatment with 30 tones of cattle manure and 1 tone of elementary sulfur per hectare on RPS can be applied.

Data for fresh and dry mass of seedling indicate that the greatest value of these parameters have seedlings grown on NRPS while lower value have seedlings grown on RPS.

Key words: peach seedlings, non replant problem soil, replant problem soil, vegetative growth

MARKETABLE BULBS OF ONION "BUCHINSKA ARSHLAMA" STORED TRADITIONALLY AND IN COLD ROOMS

Zvezda BOGEVSKA*, Rukie AGIC, Gordana POPSIMONOVA, Margarita DAVITKOVSKA, Igor ILJOVSKI

University "Ss. Cyril and Methodius" Faculty of Agricultural Sciences and Food - Skopje
email: zvezdabogevska@gmail.com

Abstract

The local old sweet onion population '*buchinska arshlama'* was stored traditionally and in cold rooms from October to April. During that period every month was calculated the percentage of marketable onions. The research was done in three seasons (2010/2011, 2011/2012 and 2012/2013).
Results showed that the percentage of marketable bulbs in 2010/2011 in traditional storage at the beginning was 94,1% but at the end the percentage of marketable bulbs was 12,71%. In 2011/2012 the percentage of marketable bulbs in October was 94,97 but in April it was 47,45. In 2012/2013 the percentage of marketable bulbs at the beginning was 89,95% and in the end it was 14,99%. In cold room the percentage of marketable bulbs is more stable during the storage period and losses are lower as result of the control conditions. In 2010/2011 the percentage of marketable bulbs was 94,07% in October and 68,43% after shelf life. In 2011/2012 at the beginning it was 93,63% but at the end it was 73,38. In 2012/2013 the percentage of marketable bulbs at the beginning was 91,16% and in the end it was 74,84%.

Key words: onion, storage, marketable bulbs

EFFECT OF CLIMATE ON THE DEVELOPMENT OF TOBACCO

Romina KABRANOVA*[1], Karolina KOCHOSKA[2], Zlatko ARSOV[1]

[1] University "Ss. Cyril and Methodius" Faculty of Agricultural Sciences and Food - Skopje
[2] University "St. Kliment Ohridski" - Bitola - Scientific Tobacco institute – Prilep
email: romina@zf.ukim.edu.mk

Abstract

The production of oriental tobaccos in R. Macedonia has a very long tradition. During the vegetation, a large number of factors have an impact on the tobacco that allow or interfere the tobacco plant to express its biological and production potentials. Except the biological potential of the varieties, the largest influence have taken scientific farming methods and agro ecological conditions during the growing season.
In the period from 2007 to 2009 the climate conditions had the greatest importance for the development of tobacco. The experiment was placed in the region of Veles on two oriental varieties *prilep NS 72* and *yaka JV 125*. Two technologies were being compared: classical seedling production as a control and floating seedling production. There is statistically significant difference between percentage of accepted plants between harvest 2007 compared to 2008 and harvest 2007 compared to 2009. The obtained yield gave different results for individual years. The highest average yield of green mass of tobacco (kg/ha) was obtained in 2008, for all tested variants. With lowest yield stands out 2007th.

Key words: oriental tobacco, variety, climate

SEED CHARACTERISTIC OF SOME DURUM WHEAT (TR. DURUM) VARIETY

Vinko STANOEV*[1], Mihajlo NIKOLOVSKI[1], Dobre ANDOV[1], Marija MENKINOSKA[2], Mirjana MENKOVSKA[3]

[1] University "Ss. Cyril and Methodius" Institute of Agriculture- Skopje
[2] Institute for livestock – Skopje
[3] University "St. Climent Ohridski" Technological - Technical Faculty
email: v.stanoev@zeminst.edu.mk

Abstract

In this study characteristics of 9 durum wheat *(Tr. Durum)* were investigated. This research was aimed to investigate the potential of seed characteristics of five cultivars of durum wheat including: Angela, Pobeda, Marta 2, Skopska rana, Ela, Sandra, Kavadarka, Mina and Iva. There were analyzed some seed characteristics as: seed fractions; absolute mass of seeds; glaziery seed; seed germination and economic value of seed. These varieties have shown interesting results in the area of farming with special reference to the characteristics of the seeds and some product features.Tr.durum wheat cultivar shows a significant variation in all measured characters, but the highest variability was observed in the fractions of seed, and lowest in germinability of seed.

Key words: *Tr.durum*, variability, quantitative traits, seed characteristics

EFFECTS OF SUBSTRATE ON GROWTH AND DEVELOPMENT OF ANISE SEEDLINGS (*PIMPINELLA ANISUM* L.)

Svjetlana ZELJKOVIĆ*, Nada PARAĐIKOVIĆ, Uroš ŠUŠAK, Monika TKALEC

University of Banja Luka - Faculty of Agriculture
University of Osijek - Faculty of Agriculture
email: svjetlana.zeljkovic@agrofabl.org

Abstract

The aim of this study was to investigate the possibility and feasibility of using spent mushroom compost from *Agaricus bisporus* as an alternative growing media for greenhouse production of *Pimpinella anisum* L. seedlings. The experiment was conducted under greenhouse conditions at Faculty of Agriculture, University of Banja Luka in 2013. It was arranged in a split - plot design with four replicates and two treatments (conventional substrate and spent mushroom compost). Morphological parameters, plant height and leaf number, were recorded regularly during growth and development of Anis seedlings. At the end of experiment, seedlings were sampled and root and above-ground fresh and dry weight and root length were recorded. Obtained results showed significantly higher values of all investigated parameters of seedlings grown on spent mushroom compost. Thus it can be concluded that use of spent mushroom compost in the production of anise seedling is possible and economically justified as well as environmental friendly.

Key words: spent mushroom compost, anise, seedlings

VEGETATIVE CHARACTERISTICS OF PLANTS WITH DECREASED VIGOROUSNESS OF SOME CHERRY VARIETIES, A PRIMARY EFFECT PRODUCT OF DIFFERENT DOSAGES OF GAMMA RAYS TREATMENT (CZ^{137})

Melpomena POPOVSKA[*1], Bojan POPOVSKI[2], Nikolaj HRISTOV[3]

[1] University "Ss. Cyril and Methodius" Institute of Agriculturae-Skopje, Skopje, Macedonia
[2] University "Ss. Cyril and Methodius" Faculty of Agricultural Sciences and Food - Skopje, Skopje, Macedonia
[3] Institute of Agriculture – Kyustendil, 2500 Kyustendil, Bulgaria
email: m.popovska@zeminst.edu.mk

Abstract

A study has been conducted on the total growth, the height of plants, the length of internods, and bud arrangement with 32 selected units characterised by decreased vigorusness, a primary effect product from Bigereau Burlat, Pobeda Krimska and Kozerska cherry varieties, being exposed to radioactive Cz^{137}. Graft branches were taken from the Institute of Agriculture – Kjustendil, and were exposed to dosages of 25Gy, 35Gy, and 45Gy at the Institute of Radiobiology and Radiopreservation in Sofia. The graft was taken during dormant buds onto a Prunus mahaleb rootstock.

The average values provide highly valuable statistical differences following all of the parametres under study for all the radiation dosages with the selected plants in contrast to the controls (plants not treated with radiation).

The total growth (98.6 cm) and the average height of plants (74.5 cm) are 60% i.e. 55% smaller in comparison with the control values. The length of internods is 15% smaller than the control value amounting to 2.9 cm. An atypical arrangement of buds has been established with 4.6% of the material. The average number of buds is 40.9 and is a lot smaller in contrast to the controls (95).

The smallest total growth was established with the plants treated with the 45Gy dosage. The smallest average height of plants, length of internods and number of buds were noticed with the 25Gy dosage. The radiation expisure of 35Gy shows for the most atypical arrangement of buds.

Key words: Prunus avium L, ionizing radiation, dosage, decreased vigorousness, total growth, height of plants, internods, buds

MORE IMPORTANT CHARACTERISTICS OF THE VEGETATIVE ORGANS OF SOME STRAWBERRY VARIETIES IN THE SKOPJE REGION

Bojan POPOVSKI[1], Melpomena POPOVSKA*[2]

[1] Faculty of Agricultural Sciences and Food -Skopje, 1000 Skopje, Macedonia
[2] UKIM Institute of Agriculture-Skopje,1000 Skopje, Macedonia
email: m.popovska@zeminst.edu.mk

Abstract

The study deals with the vegetative growth of 17 varieties of strawberries: *Idea, Camarosa, Belrubi, Evita, Honeoye, Tethis, Onda, Chandler, Miranda, Paros, Elsanta, Eris, Madlen, Favette, Marmolada*, and two standards *Senga Sengana*, and *Pocahontas*. The height of the plant, leaf number, leaf surface, assimilative surface of the plant and per hectar were investigated.

The average values provide significant statistical differences following all of the characteristics between investigated varieties.The highest growth is shown by *Eris* (32.6 cm), whereas *Chandler* has the smallest with 23.2 cm. *Honeoye* is characterised by the smallest average leaf number (30.3) opposed to *Camarosa* with the highest of 59.9. Although with the smallest number of leaves, *Honeoye* has the biggest leaf surface (124.4 cm2). *Camarosa*, on the other hand, has the highest number in leaves but smallest in leaf surface (89.4 cm2).

The highest values of the assimilative surface of the plant have *Miranda* (5497 cm2), *Onda* (5434 cm2), *Camarosa* (5353 cm2) and *Eris* (5154 cm2). The smallest assimilative surfaces of the plant have *Chandler* (3051cm2) and *Tethis* (3219 cm2).

The assimilative surface per hectar range between 13559 m2 with *Chandler* and 24433m2 with *Miranda*.

Key words: strawberry varieties, height of plant, leaf number, surface of leaf, assimilative surface.

VEGETATION PERIOD AND DIFFERENT PHENOLOGY STAGES IN MACEDONIAN LOCAL BEAN POPULATIONS (PHASEOLUS VULGARIS L.)

Afrodita IBUSHOSKA*[1], Biljana DRVOSHANOVA[1], Sonja IVANOVSKA[2], Rukije AGIC[2]

[1] Institute of Agriculture- Skopje,
[2] Faculty of Agricultural Sciences and Food – Skopje
e-mail: ibusoskaa@yahoo.com

Abstract

The main purpose of this work was to analyze the vegetation period and some phenotypic parameters of growth in local bean genotypes *(Phaseolus vulgaris L.)* in Republic of Macedonia. A total of 101 dry bean genotypes (97 Macedonian landraces and 4 Slovenian varieties-check varieties) were used as analyzing material. The aim of this research was the characterization and evaluation of the vegetative period and phenotypic diversity among common bean landraces. The experiment was set on experimental plots of the Institute of agriculture in Skopje by random complete block design (RCBD). The main investigated phenotypic parameters were: days to sprouting (DS), days to flowering (DF) and vegetation period (VP). From our findings we can conclude that the average period of sprouting ranged from 8-14 days (ssp.nanus) and 9-20 days (ssp.volubilis). Most of the dwarf populations are characterized by late flowering period, while climbing beans have early flowering period. The length of vegetation period at dwarf population ranges from 68-101 days, while in climbing population this parameter showed longer vegetation from 92 to 116 days.

Key words: *Phaseolus vulgaris*, landraces, vegetation period, days to sprouting, days to flowering

DYNAMICS OF JUJUBE (ZIZYPHUS JUJUBA MILL.) FRUIT GROWTH

Aleksandar MARKOVSKI[*1], Lenche VELKOSKA-MARKOVSKA[2]

[1] Institute of Agriculture-Skopje, Ss. Cyril and Methodius University in Skopje,
[2] Faculty of Agricultural Sciences and Food-Skopje, Ss. Cyril and Methodius University in Skopje, R Macedonia,
e-mail: mraal3@yahoo.co.uk

Abstract

During 2004-2006 fruit growth dynamic of the jujube varieties: Zu tao czao, Da baj czao, Ja czao, Vahshski 45/2, Kitajski 2A and forms Wild Midleasiatic jujube and Sirka, taken from bearing trees in the collection field of the Institute of Agriculture in Skopje were investigated.
The mass and the dimension of the jujube variety fruits were measured through vegetation, from setting up to their ripening. We found that there exist three periods of fruit growth, each period with different length for different jujube variety. The size of the fruits, their quality and also germination ability and structure of the seed depend from the different length periods.

Key words: fruit growth, jujube, variety, form, seed, period.

AMPELOGRAPHIC CHARACTERISTICS AND GENOTYPIC VARIABILITY IN AUTOCHTHONOUS CULTIVARS RED AND BLACK VALANDOVO DRENOK GROWN IN R. MACEDONIA

Biljana KORUNOSKA*[1], Zvonimir BOŽINOVIĆ[2],
Ana SARAFIMOVSKA[1], Zlatko PRCULOVSKI[2],
Dushko NEDELKOVSKI[1], Milena TASESKA-GJORGJIJEVSKI[1]

[1] University „Ss Cyril and Methodius“ Institute of Agriculture- Skopje,
[2] Faculty of Agricultural Sciences and Food – Skopje
e-mail: markovskabiljana@yahoo.com

Abstract

Ampelographic description is very important for more precise determination of the morphological and physiological characteristics of a certain cultivar or to determine the variability in the cultivar and the existence of some varieties of that cultivar. Cultivars red and black Valandovo drenok are late, table, autochthonous or incurred domestic cultivars of grapevine. Mostly, they are grown in mixed plantings, limited to a small number in the vineyard region in R. Macedonia. They can be found as individual vines in yards and small plantings of ten grown in odrin -system. Also, these two cultivars meet together in the plantations and in combination with other cultivars to act for their pollination (have functionally female flowers). In some literature data is assumed that black Valandovo drenok is variety of red Valandovo drenok. In this paper the results of perennial examinations of the ampelographic characteristics with more detail and accurately in reaching the knowledge of their origin and autochthony, their features and similarity with the ancestors and also getting data for certain genotypic variations in grapevine cultivars and the existence of varieties are presented. In R. Macedonia, these cultivars are grown long period of time, but can be found introduced in other Balkan countries. They have many positive properties that can be used to further selection. The autochthonous cultivars are rich genetic fund of grapevine important to one country.

Key words: autochthonous cultivars, ampelographic description, variability, genetic fund

THE ANALYSIS OF GROWTH AND DEVELOPMENT OF GENERATIVE BUDS OF YOUNG FRUIT-BEARING PEAR TREE

Ljubomir RADOŠ

Faculty of Agriculture, Banjaluka, Bosnia and Herzegovina
e-mail: radosljubomir@blic.net

Abstract

The process of the organogenesis of the fruit-bearing pear tree is one of the genotype specificities of this cultivar. Due to these specificities, the process of formation of generative growing points can take place in one, two and three-year cycle. Therefore, we have young fruit-bearing trees of different ages (a young fruit-bearing tree is a growth that bears fruits for the first time). The knowledge of genotype specificities in the process of organogenesis is crucial for defining certain pomotechnical treatments as well as for making the right business decisions in the organization of pear production.
In addition to the knowledge of these processes, we have conducted the analysis of the growth and development of the generative points of a young fruit-bearing tree in six pear cultivars. Based on these results, the examined cultivars were classified into corresponding groups with the aim of making a modeling of these processes.

Key words: cultivar, fruit-bearing tree, organogenesis

SOME GRAIN QUALITY CHARACTERISTICS OF TURKISH RICE VARIETIES UNDER THE GROWING CONDITIONS OF TURKEY AND MACEDONIA

Dobre ANDOV*[1], Danica ANDREEVSKA [1], Emilija SIMEONOVSKA[1], Halil SÜREK [2], Necmi BESER[3]

[1] University "Ss. Cyril and Methodius", Institute of Agriculture, Skopje, R. of Macedonia
[2] Trakya Agricultural Research Institute, Edirne, Turkey
[3] Trakya University, Edirne, Turkey
e-mail: dr_andov@yahoo.com

Abstract

During the last few years, the rice production in the Republic of Macedonia was faced up with serious decrease of the head rice yield in San Andrea, the prevalent variety in the country. Therefore, there is a demand of introducing new rice varieties with shorter vegetation and better head rice yield. In this paper, the head rice yield and one thousand grain weight (of paddy rice and of white rice) were analyzed on six Turkish rice varieties (*Gala, Halilbey, Gönen, Paşalı, Efe* and *Hamzadere*), grown up under agro-ecological conditions of Macedonia and Turkey. Two standard varieties – Prima riska (Macedonian variety) and San Andrea (Italian variety), both grown under Macedonian conditions, were used for comparison of the results. Under the growing conditions of Macedonia, the highest head rice yield was found in the variety *Gala* (58,20%), the lowest was in the variety *San Andrea*, while the average head rice yield was 47,48%. The highest head rice yield of Turkish rice varieties under the growing conditions of Turkey was achieved in the variety *Efe* (62,7%) while the average value of the same characteristic was 57,97%, which was 9,45% higher than the average value of the head rice yield obtained under Macedonian growing conditions (48,52%). All these results lead to conclusion that the climatic and soil conditions have a great impact on head rice yield, even though it is genetically determined in each variety. In this investigation, the highest thousand grain weight of paddy rice and of white rice was found in the standard variety *Prima riska*, grown under Macedonian rice growing conditions (paddy – 41,20 g and white rice 31,2 g). The variety *Paşalı* was characterized with the smallest grain (in Macedonia, the thousand grain weight of the pad-

dy was 32,20 g and of the white rice was 23,5 g, while in Turkey 31,6 g and 22,8%). The grain of the variety *Gönen* was the largest among all of the Turkish varieties (grown in Macedonia - with 40,40 g thousand grains weight for paddy, 31,00 g for white rice; grown in Turkey - 39,40 g and 27,80 g correspondingly).

Key words: rice, varieties, head rice yield, one thousand grains weight

SELECTION OF FEKETICKA SOUR CHERRY BASED ON POMOLOGICAL CHARACTERISTICS

Maja MIODRAGOVIĆ[1], Goran BARAĆ[1], Vladislav OGNJANOV[1], Janos APOSTOL[2], Jovana DULIĆ[1], Mirjana LJUBOJEVIĆ[1], Dusica DORIĆ[1]

[1] University of Novi Sad, Faculty of Agriculture,
[2] NARIC Fruitculture Research Institute- H-1223 Budapest Park str.2
e-mail: maja.miodragovic@polj.uns.ac.rs.

Abstract

A total of 12 Feketićka sour cherry accessions were collected from two different locations and analysed within this research. The highest fruit weight (6,47g) was observed in accession Pc_1105 and the lowest in accession Pc_1112 (4,39g). Stone weight was smallest within accession Pc_1107 (0,23g) and the largest in Pc_1109 (0,40g). Fruit ratio, the edible part of the fruit (mesocarp and skin) in the total fruit weight, ranged from 92,38% (Pc_1112) to 95,25% (Pc_1107). Accessions stalk length varied from 42mm (Pc_1101) to 56,89mm (Pc_1111). The lowest average soluble solids content exhibited genotype Pc_1107 (10,38%) and the highest Pc_1106 (15,22%). Fruit flesh has firm consistency with red color of juice and excellent taste.

Key words: Sour cherry, pomological characteristics, Feketicka cherry

QUALITY PROPERTIES OF SOME DOMESTIC AND INTRODUCED RICE VARIETIES (*ORIZA SATIVA* L.)

Danica ANDREEVSKA[1*], Dobre ANDOV[1], Mirjana MENKOVSKA[2], Natasha GJORGOVSKA[2] Vesna LEVKOV[2]

[1] "Ss. Cyril and Methodius" University, Skopje, Institute of Agriculture, Skopje, R. of Macedonia
[2] "Ss. Cyril and Methodius" University, Skopje, Institute of Animal Science, Skopje, R. of Macedonia
e-mail: danicaandreevska@gmail.com

Abstract

Rice (*Oryza sativa L.*) is one of the most important cereal crops in the world and represents the main food for half of the world population. In R. of Macedonia rice has a longlasting growing tradition. Besides the yield of the crude rice-paddy and of the white rice for farmers, their quality is also important. In the paper some grain quality properties of the crude and white rice of two domestic rice varieties (*mesen blatec* and *prima riska*), of eight new bred genotypes (*P1xM, P2xM, PxMM, MBLxM, MBLxMM, 79/22-2, 78/12-3-4* and *78/12-3-5*) and of four Italian rice varieties (*arpa, monticelli, onice* and *san andrea*) were analyzed. As a standard, the varieties prima riska and san andrea were used. The average head rice yield (the percentage of the whole grains) of the investigated genotypes and varieties was 53,64%. The highest head rice yield was obtained by the genotype *PxMM* (63,90%), while the lowest by the genotype *78/12-3-4* (39,00%). The highest value of one thousand grains weight of the paddy and white rice was determined with the genotype *78/12-3-4* (paddy- 42,40 g and white rice - 30,00 g), and the lowest value with the variety *arpa* (arpa:26,40 g and white rice:18,40 g). The highest percentage of paddy crude fiber was obtained with the variety *san andrea* (11,81%), while of white rice was obtained with the variety *prima riska* (0,78%). The highest crude protein average value of the paddy grain was obtained with the variety *oniche* (7,38%), and of the white rice grain with the genotype *MBLxMM* (7,31%). The average fat value of the paddy grain ranged from 0,78% (with the variety *arpa*) to 2,64% (with the variety *mesen blatec*). Fat content of the white rice grain ranged from 0,05% (with the genotype *78/12-3-5*) to 1,19 % (with the standard variety *san andrea*). The highest ash value of the paddy grain was obtained with the variety *oniche* (4,75%), while of the white rice with the variety *san andrea* (0,47%).

Key words: rice, variety, genotype, paddy, white rice, head rice yield, grain quality

ANTIOXIDANT ACTIVITY OF HAZELNUT (*CORYLUS AVELLANA* L.) AND SWEET CHESTNUT (*CASTANEA SATIVA* MILL.) POLLEN EXTRACTS

N. NIKOLAIEVA*[1], O. GRYGIRIEVA[2], J. BRINDZA[3], K. GARKAVA[1], S. KLYMENKO[2]

[1] National aviation university, Institute of Ecological Safety, Kyiv, Ukraine
[2]M.M. Gryshko National Botanical Garden of Ukraine National Academy of Sciences, Kyiv, Ukraine
[3] Slovak University of Agriculture in Nitra, Institute of Biodiversity and Biological Safety, Slovak Republic
e-mail: n.nikolaeva703@gmail.com

Recently began to manifested great interest to the antioxidant activity of various foods, as antioxidants - a broad group of biologically active compounds, which perform the protective function, as expressed in the ability to neutralize the negative impact of free radicals. Antioxidants are widely used in chemical, food, cosmetic, pharmaceutical industry, biology and medicine. Especially widely they are used as part of dietary supplements. The aim of this study was to determine the in vitro antioxidant activity of hazelnut (*Corylus avellana* L.) and sweet chestnut (*Castanea sativa* Mill.) in water, methanol and ethanol. In the experiment we investigated three samples of hazelnut (*C. avellana* L.) and sweet chestnut (*C. sativa* Mill.) pollen collected from M.M. Gryshko National Botanical Garden of Ukraine in three times repeated. We prepared pollen extracts: 0.5 g of pollen and 12.5 ml of water, methanol and ethanol. The solutions were stirred on a shaker for 2 hours. The total antioxidant activity was determined by the DPPH method. The antioxidant activity of hazelnut pollen extracts in water was determined in the range from 75.59% to 78.88%, pollen extracts in methanol – in the range from 82.09% to 82.92%, pollen extracts in ethanol – from 39.08% to 57.86%. The antioxidant activity of sweet chestnut pollen extracts in water was determined in the range from 89% to 92.12%, pollen extracts in methanol – in the range from 93.16% to 95.32%, pollen extracts in ethanol – from 65.19% to 67.34% In the researches we observed high levels of antioxidant activity in methanolic extracts, and smaller – in etanolic extracts. An elevated level of antioxidant potential in the pollen determines their biological properties, which conditioned of the biological active substances.

Key words: hazelnut, sweet chestnut, pollen, antioxidants.

INFLUENCE OF FOLIAR FEED UP TO PRODUCTIVE – TECHNOLOGICAL PROPERTIES ON VARIETES VRANEC AND SMEDEREVKA

Mihail PETKOV*, Zvonimir BOZINOVIC, Zlatko PRCULOVSKI

Faculty of Agricultural Sciences and Food-Skopje, Ss. Cyril and Methodius University, R Macedonia
e-mail: petkovdrmihail@gmail.com

Abstract

The aim of the research was to establish influence of foliar fertilizers to yield, weight of bunch, content of sugars and acids, content of total polyphenols and degree of maturity of seeds at varieties vranec and smederevka. We used fertilizers produced by ALKALOID – Skopje, according to programme for foliar application in vine producing – wine varieties.

According to the data from research, we can conclude that there are very positive impact of foliar feed up to the yield, weight of bunch, content of sugar, maturity of seeds and content of total anthocyanins.

The yield of grape at the threated variant was bigger for 4% at the variety vranec and 12% at the variety smederevka. Application of foliar feed up gives bigger weight of bunch for 3% for vranec and 10% for smederevka. Content of sugar is bigger at the treated variants for 5 g/l at smederevka and 7 g/l at variety vranec. Treated variants of vranec have 67% matured seeds vs. standard with 61% matured seeds. At variety smederevka treated variant have 65% matured seeds, vs. standard with 58%. Content of total anthocyanins at standard variant is 806 mg/kg grape, and the treated variant has 840 mg/kg at the variety vranec.

Key words: foliar fertilizers, yield, weight of bunch, sugar, seed, anthocyanin

AMPELOGRAPHIC CHARACTERISTICS OF SOME VARIETIES AFUS ALI IN R. MACEDONIA

Zvonomir BOZINOVIK, Mihail PETKOV, Zlatko PRCULOVSKI*

Faculty of Agricultural Sciences and Food-Skopje, Ss. Cyril and Methodius University, R Macedonia
e-mail: z.prculovski@hotmail.com

Abstract

For all registered varieties of afus ali sort, comparatively are examined ampelographic characteristics. Afus ali sort has more varieties and clones. In our examinations ware included varieties which are diffrent by their form of the seed. We registered: a variety with round form of the berry, a variety with cylindrical-lengthened berries and a variety with jiryes form. With this examination was used ampelographic identification, description using the COD system, quantity of harvested grapes, length and form of the bunch and berry, organoleptic characteristic of the grape and chemical ingredients of the must.
Based on this examination by botanical view, we concluded that all varieties are belonging to afus ali sort. Differences between varieties are also found in the form of the seeds. By applying the COD system, differences are also found in the codes: 205, 220,221, 505 and 506. The largest amount of packaged grapes from 17.829 kg/ha was achieved in the cylindrical-lengthened berries variety, and the lower quantity from 12.634 kg/ha was obtained on the variety with round form of the berry.
The weight of the bunch varies from 503 g in the variety with cylindrical-lengthened berries, up to 600 g in the jiryes variety. The highest weight of the berry - 5,76 g has jiryes variety, and the smallest weight of the berry - 5,22 g has the round variety. The highest organoleptic grade of 9,5 points has the variant with a cylindrical form, and the other two varieties has 7,8 points. Amounts of sugar vary in the borders between 181 g/l in the round variety, to 218 g/l in the jiryes variety. The amount of total acids vary from 4,10 g/l in the round variety to 4,53 g/lin in jiryes variety.
From all off these, we determinated that the best characteristics and best quality of the grape is characterized in variety with cylindrical-lengthened berries.

Kay word: identification, varieties, organoleptic grade, berryes form, weight of the bunch, chemical, characteristics.

SUSTAINABLE AGRICULTURE

SENSITIVITY OF CHERRY CULTIVARS AND ELITES TO LOW WINTER TEMPERATURES

Nikolai CHRISTOV*[1], Simeon KRUMOV[1], Melpomena POPOVSKA[2]

[1] Institute of agriculture – Kyustendil, Bulgaria
[2] University "Ss. Cyril and Methodius" Institute of agriculture – Skopje, Macedonia
email: nicolaichr@abv.bg

Abstract

Study was conducted in the area of the Institute of Agriculture - Kyustendil at 12 cherry cultivars: Stella, Royalton, Merchant, Vanda, Bigarreau Burlat, Vic, Bing, Valeska, Kozerska, Heartland, Regina, Tragana Edesis and at 11 cherry elites: № 5752, 6374, 32/23, 5750, 32/20, P15R3D9, 6546, 6541, 1890, 6400 and 5937. The trees are grafted on *Prunus mahaleb* rootstock. Van is used as control cultivar. On 13 and 14 December 2012 an absolute minimum air temperature fell to -18,3ºC -19,5ºC and with a duration of influence than 3 and 4 hours. Temperatures are measured in a standard weather cell to 2 m in height. The analysis results show that damages on the generative organs are significant, which is due to a sharp drop in temperatures at the beginning of the trees mandatory rest. Under the particular conditions, at least damage the colored rudiments are cultivars Vanda (10,5%), Heartland (15,3%), Regina (18,2%) and elite № 5750 (23,2%). The degree of damage from low winter temperatures is highest at Bing (98,3%), № 6374 (95,3%), № 32/20 (95,3%), Valeska (94,9%), № 5937 (94,8 %) and standard cultivar Van (93,6). The damage degree ranged between 31,0% and 82,8% at other cherry cultivars and elites.

Key words: Prunus avium L, cultivars, low temperature, cold resistance

GENESIS AND PROPERTIES OF RANKERS SPREAD OUT IN THE REGION OF KONAR – PEHCEVO

Mile MARKOSKI*[1], Tatjana MITKOVA[1], Tatjana PRENTOVIĆ[1], Kole VASILEVSKI[2]

[1] University "Ss. Cyril and Methodius" in Skopje, Faculty of Agricultural Sciences and Food-Skopje
[2] University "Ss. Cyril and Methodius" in Skopje, Faculty of Forestry -Skopje
email: mmarkoski@zf.ukim.edu.mk

Abstract

The sustainable development in agriculture is based on fundamental economic and social principles, along with minimum environmental degradation, with an emphasis on the soils. In this paper are presented the results of the research of soil genesis conditions and the genesis, as well as the properties (mechanical content, chemical and productive properties) of rankers spread out in the region of Konar, Pehcevo. The purpose is to apply certain measures for their sustainable use and to eliminate some negative processes and properties. For this purpose 3 soil profiles have been studied and 12 samples have been taken and analyzed. The investigated soils do not contain carbonate (CaCO3) and are middle to weakly in humus. Furthermore, they are poorly supplied with available phosphates, medium to poorly of nitrogen and potassium, and according to mechanical composition they are sandy clay loam, sandy loam, loamy to clay soils. The properties of production of the rankers largely depend on the depth of both the profile and the terrain. From our field studies, it can be concluded that the terrain is suitable for the organization of agricultural production, with previous removal of the negative properties and processes that have occurred due to the way that soils have been used up until now.

Key words: ranker, genesis, properties, measures for sustainable use of soils

MORPHO-ANATOMICAL CHARACTERISTICS AND ELEMENT COMPOSITION OF CHERRY LEAVES RELATIVE TO RESISTANCE TO COCCOMYCES

Svetlana MOTYLEVA

All-Russian Horticular Institute for Breeding,
Agrotechnology and Nursery
email: motyleva_svetlana@mail.ru

Abstract

Sculpture leaf surface plays an important role in the adaptation of fruit plants to environmental conditions and pathogens (Vavilov, 1935; Schmalhausen, 1968; Deverol, 1980). On herbaceous and woody plants, it is shown that the most pronounced ecological specialization reflected in the anatomical structure of the sheet, they relate to the thickness of the plate, the outlines of the epidermal cells, the nature of the cuticle, quantitative indicators of assimilation tissue (Kravkina, Miroslavov, 1980; Pautov, Yakovlev, Kolodyazhni, 2002). Researchers (P'yankov et al., 2001) shows that the concentration of chemical elements in the leaves is closely related to the structure of the sheet. The purpose of research - the identification of a variety of morphological and anatomical characteristics and chemical composition of the leaves of cherry genotypes with varying degrees of resistance to the prospect of coccomyces use in breeding. The comparative electron and microscopic study of the organization of leaf cuticle integument of 14 cherry genotypes (*Prunus Cerasus L.*) with different levels of resistance to coccomyces has been conducted. Their element composition has been determined. Significant differences between coccomyces resistant and unstable cherry genotypes are shown in leaf morpho-metric parameters (epidermis thickness, cell perimeter), cuticle texture and chemical composition. It has been stated that cuticle of coccomyces resistant cherry genotypes is strongly developed and contents dendrits; potassium, chlorine, manganese and iron prevail in a chemical composition. The results confirm an expediency of using these features for the purpose of revealing adaptive genotypes in early stages of a selection process.

Key words: leaf cherry, scanning electron microscopy, elemental composition, coccomyces

THE IMPACT OF COMMERCIAL STRAIN OF MALOLACTIC BACTERIA ON SENSORY PROFILE ON WINE FROM THE GRAPE VARIETY VRANEC

Milica PLETVARSKA GLIGOROVSKA[1], Goran MILANOV *[2]

[1] Winery "Skovin" - Skopje
[2] University "Ss.Cyril and Methodius", Institute of Agriculture-Skopje, Republic of Macedonia
e-mail: milanovg@yhoo.com

Abstract

The production of well- balanced wines requires a balance between the sugar, acid and flavour components of wine. The factors that affect on the style of the wine are variety of the grape, quality of the grape and microorganisms included in the process of vinification. Malolactic fermentation induced by the addition of malolactic starter cultures, regarded as the preferred method for naturally reducing wine acidity, efficiently decreases the acidic taste of wine, improves the microbial stability and modifies the organoleptic character of wine. This study compares 3 commercial selected lactic acid bacteria strains of the species Oenococcus oeni on Vranec wine. Different commercial strains give different styles of the wine.

Keywords: malolactic fermentation (MLF), wine lactic acid bacteria (LAB)

USE OF HYDROGEN PEROXIDE TO IMPROVE THE CHEMICAL CONTENT AND SENSORIAL CHARACTERISTIC OF GRAPE BRANDY

Dushko NEDELKOVSKI*; Goran MILANOV; Ana SERAFIMOVSKA;
Klime BELESKI; Biljana KORUNOSKA;
Milena TASESKA-GJORGJIJEVSKI

"Ss. Cyril and Methodius" University, Institute of Agriculture,
Skopje, R. of Macedonia
e-mail: duskosk8@yahoo.com

Abstract

During 2013-2014 we studied the influence of hydrogen peroxide usage to improve the chemical content, to decrease the excessive amount of total acids and total esters – ethyl acetate in grape brandy obtained from distillated fermented red grape mash form the grape variety Merlot. The results from the investigation have shown that with multiple hydrogen peroxide treatments during a period of nine months, the excessive level of total acids in the grape brandy can be lowered, which will improve the chemical composition and sensory evaluation of the grape brandy.

Key words: grape brandy; hydrogen peroxide; grape mash; sensory evaluation

PLANT PROTECTION AND FOOD SAFETY

HELICOVERPA ARMIGERA - PEST CONTROL ON TOBACCO

Vesna KRSTESKA*, Marija SRBINOSKA, Petre STOJANOSKI

University "St. Kliment Ohridski" -Bitola,
Scientific Tobacco Institute- Prilep,
Republic of Macedonia
e-mail: vkrsteska@yahoo.com

Abstract

Helicoverpa armigera is a pest of major importance in areas in which are produced certified tobacco seed.

In severe infestations larvae, may destroy them completely: flowers, seed capsules, also top leaves.

During 2011-2013, field trials were carried out on the Experimental field of Scientific Tobacco Institute-Prilep, for the control of *H. armigera*, with three insecticides: chlorpiriphos (Pyrinex 48 EC)- 0,15%, metomil (Metomyl 90-SP) -0,06%, chlorpiriphos+cypermetrin (Nurell D)- 0,15%.

During tobacco vegetation *H. armigera* occurs with a different quantitative representation, depending on the climatic conditions in 2011-2013. Besides climatic conditions, entomophages, entomopathogens, cannibalism limits the number of insects per plant.

The all applied insecticides showed high effectiveness in tobacco bollworm control. The highest efficacy in the control of this pest was obtained with the insecticide (Nurell D)- 0,15%.

The best moment for treatment with an insecticide is while the larvae are very small (L1 or L2). Larvae during L5 and L6 consume about half of their overall diet.

Older larvae burrow into the floral organs where they become less accessible to contact insecticides, require higher doses to kill and cause direct economic loss.

Having in mind its considerable pest significance, great efforts and precise measures for H. armigera control are needed to achieve visible results.

Key words: tobacco, *H. armigera*, integrated control, insecticides

DYNAMICS OF PHOTOSYNTHETIC PIGMENTS IN LEAVES OF GRAFTED CUTTINGS AFTER TREATMENT OF THE VINE NURSERY WITH HERBICIDES

Neli PRODANOVA-MARINOVA

Institute of Viticulture and Enology - Pleven, Bulgaria,
e-mail: neli_npm@abv.bg

Abstract

The trial was carried out in the nurseries of the Institute of Viticulture and Enology – Pleven on leached chernozem soil type. The effect of some herbicides on the dynamics of photosynthetic pigments in leaves of grafted cuttings of Misket Kaylashki variety in the vine nursery was studied.

It has been found that herbicides Venzar 80 VP (*800 g/kg lenacil*), Dual Gold 960 EC (*960 g/l s-metolachlor*), and Lumax 538 SC (*375 g/l s-metolachlor + 125 g/l terbuthylazine + 337 5 g/l mesotrione*) in the applied doses of treatment did not affect adversely the synthesis and dynamics of photosynthetic pigments. Devrinol 4F (*450 g/l napropamide*) exhibited an unsatisfactory herbicidal effect and the huge weeding of the experimental plots after the thirtieth day of treatment had an inhibitory effect on the formation of chlorophyll *a*, chlorophyll *b*, and carotenoids. The correlations between the different types of pigments (chlorophyll *a* : chlorophyll *b* and chlorophyll *a*+*b* : carotenoids *c*) varied insignificantly and remained within the normal range for young vines.

Keywords: vine nursery, herbicides, pigments, chlorophylls, carotenoids

SUSCEPTIBILLITY OF THE PLANT PATHOGENIC BACTERIA TO THE CRUDE (FRESH) GARLIC EXTRACT (*ALLIUM SATIVUM* L.)

Slobodan VLAJIĆ, Renata ILIČIĆ*, Jelica BALAŽ

Faculty of Agriculture, University of Novi Sad
email: renata.ilicic@polj.uns.ac.rs

Abstract

Control of bacterial diseases presents an increasingly common problem in the production of fruits, vegetables, field crops and various ornamental plants, since there are no available and efficiency measure of protection. In this study were used the bacterial strains of *E. amylovora* originating from apples (3 strains) and quince (3 strains), *P.s.* pv. *syringae* (3 strains) and *P.s.* pv. *morsprunorum* (1 strain) originating from the sweet cherry. The crude (fresh) garlic extract was prepared by mechanical squeezing of cloves. To investigate the effect of crude (fresh) extract of garlic on phytopathogenic bacteria agar diffusion method was used. For the testing was used: concentration of crude (fresh) garlic extract (solid conc. and 50% dilution); copper - hydroxide (conc. 0.50% and 0.25%) and streptomycin - sulfate (conc. 0.02% and 0.01%). As a control was used sterile distilled water. Evaluation of efficiency was performed by measuring the zone of inhibition (mm), after incubation for 24 hours at 27˚C. The best effect in all tested strains showed a concentrated extract of garlic: *E. amylovora* (23.7), *P. s.* pv. *syringae* (12.1) and *P.s.* pv. *morsprunorum* (22.5). In the copper application was not observed the zone of inhibition. The efficiency of streptomycin - sulfate conc. 0.02% was the following: *E. amylovora* (8.8); *P. s.* pv. *syringae* (13.1) and *P.s.* pv. *morsprunorum* (18.5). The inhibition zone of garlic extract in all applied concentrations in compared to the other compounds in the all tested *E. amylovora* and *P. s.* pvs. strains showed statistically significant differences.

This work was supported by TR 31038 Project of the Ministry of Education and Science of the Republic of Serbia.

Key words: Susceptibility, garlic extract (*Allium sativum* L.), *Erwinia amylovora*, *Pseudomonas syringae* pvs.

OPPORTUNITIES IN CONTROLLING OF *PLASMOPARA VITICOLA* – DOWNY MILDEW OF GRAPE VINE WITH NOVEL FUNGICIDES

Rade RUSEVSKI[1], Biljana KUZMANOVSKA[1], Katerina BANDZO[2], Slobodan BANDZO*[2]

[1] University "Ss. Cyril and Methodius" Faculty of Agricultural Sciences and Food - Skopje
[2] University "Ss. Cyril and Methodius" Institute of Agriculture-Skopje
email: dbandzo@yahoo.com; s.bandzo@zeminst.edu.mk

Abstract

The aim of this research was to establish the efficacy of the fungicides MILDICUT 25 SC and PROFILER in controlling of *Plasmopara viticola* – downy mildew of grape vine. The experiment was conducted in the area around Skopje on grape vine, variety Vranec, and in the area around Gradsko on grape vine, variety Afus Ali. During 2013, the analysis was performed in four variants for the fungicide MILDICUT 25 SC and in three variants for PROFILER, for each tested variety. During the experiment, the fungicides MILDICUT 25 SC and PROFILER applied in the tested concentrations showed high efficacy of 100% in the area around Skopje and Gradsko, in conditions when the control infestation index was 18,3% and 25,4%, respectively. MILDICUT 25 SC represents a very effective preventive fungicide, while PROFILER beside preventive, is also a curative fungicide. They both have a strong effect on the control of downy mildew of grape vine.

Key words: *Plasmopara viticola*, downy mildew of grape vine, MILDICUT 25 SC, PROFILER, fungicide efficacy

COMPARATIVE EVALUATION OF THE RESPONSE OF GRAPEVINE CULTIVARS TO MILDEW (*PLASMOPORA VITICOLA*)

Ilian SIMEONOV*, M. IVANOV, Z. NAKOV, N. GENOV, M. TODOROVA, S. KRUMOV, M. BOROVINOVA

Institut of Viticulture and Enology, Bulgaria
email: iliannsimeonov@gmail.com

Abstract

At the Institute of Viticulture and Enology - Pleven and Institute of Agriculture - Kyustendil was carried out a comparative survey of the response of the grapevine cultivars to mildew (*Plasmopara viticola*). It was found that the European cultivars (*Vitis Vinifera*) were characterized by very high susceptibility to mildew under weather conditions of Pleven during the study period. The interspecies table grapevine cultivars had a lower rate of attack under high infective background during the period of investigation, and show increased resistance to mildew under field conditions. The most resistant cultivar to *P. viticola* according our study was cultivar Garant. Observing the summarized data from immunological studies of different of origin table grapevine cultivars we could make the conclusion that the higher resistance of interspecies cultivars to mildew is genetically determined and due to their interspecies origin.

Under the weather conditions of Kyustendil all studied table grapevine cultivars were susceptible to mildew, but to varying degrees. The least susceptible to the pathogen is cultivar Diana and the most susceptible - cultivar Dunav.

Key words: grapevine, cultivar, susceptible/resistance, mildew

INFLUENCE OF SOME HERBICIDES ON BARLEY SPIKE LENGTH DEPENDENT ON THE GROWTH STAGES

Gordana GLATKOVA

University "Ss Cyril and Methodius", Institute of Agriculture-Skopje
e-mail: gordana_glatkova@yahoo.com

Abstract

During 2005/2006, 2006/2007 and 2007/2008 an experiment was carried out including three barley varieties (reks, novosadski 293 and egej), treated with six herbicides (2,4-D, MCPP+dikamba, triasulfuron+dikamba, 2,4-D+florasulam, amidosulfuron+jodosulfuron and florasulam+flumetsulam) during three different growth stages (tillering, first node visible and second node visible). The aim of this experiment was to consider the influence of herbicides (applied in different growth stages) on barley spike length.

In 2006 at reks variety the herbicide combination triasulfuron+dikamba in all three growth stages significantly increased barley spike length compared with weed free control. The herbicide combination florasulam+flumetsulam and amidoslufuron+jodosulfuron in first node visible stage significantly decreased barley spike length compared with weed free control. At novosadski 293 variety herbicide combinations triasulfuron+dikamba in all three growth stages, MCPP+dikamba and forasulam+flumetsulam in tillering and second node visible stage, 2,4-D in second node visible stage and 2,4-D+florasulam in tillering stage significantly increased barley spike length compared with weed free control.

In 2007 at reks variety the herbicide combination amidosulfuron +jodosulfuron in first node visible stage significantly decreased barley spike length compared with weed free control. At novosadski 293 herbicide 2,4-D in tillering and first node visible stages, the herbicide combinations MCPP+dikamba in tillering stage and triasulfuron+dikamba in first node visible stage significantly increased barley spike length compared with weed free control.

In 2008 at reks and novosadski 293 varieties, the herbicide combination amidosulfuron+jodosulfuron in all three growth stages significantly increased barley spike length compared with weed free control.

Key words: barley varieties, herbicides, growth stages, barley spike length.

INFLUENCE OF HERBICIDES ON NUMBER OF GRAIN PER SPIKE AT SOME BARLEY VARIETIES DEPENDENT ON THE GROWTH STAGES

Gordana GLATKOVA

University "Ss Cyril and Methodius", Institute of Agriculture-Skopje
e-mail: gordana_glatkova@yahoo.com

Abstract

During 2005/2006, 2006/2007 and 2007/2008 an experiment was carried out including three barley varieties (reks, novosadski 293 and egej), treated with six herbicides (2,4-D, MCPP+dikamba, triasulfuron+dikamba, 2,4-D+florasulam, amidosulfuron+jodosulfuron and florasulam+flumetsulam) during three different growth stages (tillering, first node visible and second node visible). The aim of this experiment was to consider the influence of herbicides (applied in different growth stages) on number of grain per spike at some barley varieties.

In 2006 at reks variety the herbicide combinations 2,4-D+florasulam in tillering stage and triasulfuron+dikamba in second node visible stage significantly increased number of grain per spike, compared with weed free control. At novosadski 293 herbicide combination 2,4-D+florasulam in tillering stage highly significant reduced number of grain per spike, compared with weed free control. Herbicides 2,4-D and florasulam+flumetsulam in first node visible stage and amidosulfuron+jodsulfuron and florasulam+flumetsulam in second node visible stage significantly reduced number of grain per spike, compared with weed free control. At egej variety the herbicide combination amidosulfuron+jodsulfuron in tillering stage highly significant increased number of grain per spike. 2,4-D in tillering stage and herbicide combinations triasulfuron+dikamba and amidosulfuron+jodsulfuron in second node visible stage significantly reduced number of grain per spike, compared with weed free control.

In 2007 the investigated herbicides did not significantly influence the barley number of grain per spike.

In 2008 only at egej variety the herbicide combination triasulfuron+dikamba in tillering stage significantly reduced number of grain per spike, compared with weed free control.

Key words: barley varieties, herbicides, growth stages, number of grain per spike

DEVELOPING HERBICIDE RESISTANT PROMISING RICE LINES TO CONTROL RED RICE

Halil SÜREK*, Rasim ÜNAN, Recep KAYA, Necmi BEŞER

Trakya Agricultural Research Institute, Turkey
e-mail: surekhalil55@gmail.com

Abstract

The objective of this study was to develop IMI (Imidazolinone) group herbicide resistant rice varieties to control weedy rice (red rice) and the weeds gained resistance against conventional rice herbicides in rice fields. For this, the thirteen cross combinations were done with an IMI resistant rice variety at Trakya Agricultural Research Institute in Turkey in 2007. Using these crosses, some breeding activities were carried out.

The single cross was conducted to create segregating population. The modified bulk selection method was practiced for selection. For this, F2 was planted and harvested as bulk and F3 was planted as bulk and harvested as single plant selection. Afterward, the pedigree selection method was practiced. The selection continued until obtaining the pure lines to F6-F7 generation.

As a result of these studies promising IMI resistant lines were developed and they were tested in the yield trials in 2012 and 2013. The yield trails were conducted with randomised complete block experiment design with three replications at Trakya Agricultural Research Institute.

The observations were recorded for flowering and maturity days, plant height and panicle length, the number of panicles per square meter, spikelet sterility, grain shattering, lodging, paddy yield, 1000 grain weight of rice and milled grains, head and total milled rice yield.

As preliminary results, some promising IMI resistant rice lines were selected in 2013, and they are being tested in the regional trials and demonstration experiments under farmer's conditions in 2014. A few of them will be nominated for registration as commercial varieties in the end of 2014 crop season.

Key words: Herbicide resistant, Imidazolinone herbicide, rice (*Oryza sativa* L.), rice breeding.

SEROLOGICAL APPROACH IN THE DETECTION OF VIRUSES ON PEPPER PLANTS CULTIVATED ON OPEN FIELDS IN THE REPUBLIC OF MACEDONIA

Katerina BANDZO*[1], Rade RUSEVSKI[2], Biljana KUZMANOVSKA[2], Slobodan BANDZO[1], Elizabeta MISKOSKA MILEVSKA[2], Zoran POPOVSKI[2]

[1] Institute of Agriculture – Skopje
[2] Faculty of Agricultural Sciences and Food – Skopje
e-mail: kbandzo@yahoo.com

Abstract

Fast and efficient identification of plant viruses is an important prerogative for intensive crop production. This on-going study is performed in order to determine the virus status of pepper plants (*Capsicum annuum*) cultivated on open fields in the Republic of Macedonia. In 2012 leaf samples were collected three times throughout the vegetation from the following locations: Kochani, Prilep, Sv. Nikole, Skopje, Kumanovo, Strumica, Radovish and Bitola. DAS ELISA serological method was conducted on the collected samples to determine the presence and the distribution of three common pepper viruses in R. Macedonia: Cucumber mosaic virus (CMV), Alfalfa mosaic virus (AMV) and Potato virus Y (PVY). These viruses are economically important viruses which can cause great damage to the plant production. It was realized that the pepper plants cultivated on open fields were susceptible to plant viruses. Among the total number of tested samples, pepper plants were mostly infected by CMV (56%), while the infections by AMV and PVY were less present (1-2%). The virus distribution on the pepper plants was growing throughout the vegetation. Using performed analysis, the dynamics of virus antigen accumulation during the production period was determined. The study will be further expanded with molecular characterization of the mentioned viruses using reverse transcription PCR approach, followed by sequencing.

Key words: virus dynamics, antigen accumulation, Cucumber mosaic virus (CMV), Alfalfa mosaic virus (AMV), Potato virus Y (PVY)

NEWLY REPORT OF *CUCUMBER MOSAİC VİRUS* (CMV) İN CAPER BUSH, *CAPPARİS SPİNOSA* (L.) (CAPPARACAEA) İN TURKEY

Hakan FİDAN*, Mustafa GÜLLÜ

Biological Control Research Station, P.O.BOX: 21, 01321 Yüreğir, Adana – TURKEY
e-mail: hakanfidantr@hotmail.com

Abstract

Caper bush, *Capparis spinosa* L. (Capparaceae), is a spiny, splayed, bushy formed perennial plant which is benefited as multi-purposed from its leaves, shoots, buds, flowers and fruits. Tender young shoots including immature small leaves may also be eaten as a vegetable, or pickled. More rarely, mature and semi-mature fruits are eaten as a cooked vegetable. This study was carried out as surveys on natural planted caper bushes in August-September in Balçova-İzmir (Turkey), 2013. Samples from leaves and shoots illustrating deformation and yellowing during surveys were taken and tested for viruses in laboratory. Plants tested using DAS-ELISA and RT-PCR methods were infected with *Cucumber mosaic virus* (CMV) confirmed using serological and molecular methods. RT-PCR products were sequenced directly, and as the result of BLAST using datas from sequences, CMV isolate in caper bush showed 97% similarity with HE971670, AJ810259, JN054635 and FM999062 isolates. As a result of tests, "*Cucumber Mosaic Virus* (CMV)" was determined in caper bush. This virus is the first record in caper bush plants in Turkey.

Key words: *Capparis spinosa*, RT-PCR, CMV Virus, DAS-ELISA,Turkey

INFLUENCE OF WINE TREATMENTS ON HEAVY METALS CONTENT

Ana SERAFIMOVSKA, Milena TASESKA-GJORGJIJEVSKI,
Dusko NEDELKOVSKI*, Goran MILANOV, Biljana KORUNOSKA

University "Ss.Cyril and Methodius", Institute of Agriculture-Skopje, Republic of Macedonia
e-mail: duskosk8@yahoo.com

Abstract

Various heavy metals (As, Cd, Cu, Fe, Ni, Pb and Zn) in red wine produced by Pinot Noir wine variety, grown in Skopje vineyards, were the field of interest. The aim of our investigation was to determine which used treatments decreases the content of heavy metals in wine and what is the influence of elements on the quality (chemical composition, sensor evaluation) of wine. Clarification with skim milk, gelatin treatment, blue clarification, centrifugation and filtration were the treatments applied to wine. The determination of elements was performed by atomic absorption spectrometry. The greatest effect on decreasing of content of elements was performed by blue clarification, versus the other treatments and due to adding of 0.5 % solution of K4[Fe(CN)6], the content of heavy metals was significantly lower compared to the control sample.

Key words: Pinot Noir, wine, heavy metals, blue clarification.

THE DETERMINATION, DISTRIBUTION AND PARASITOID SPECIES OF THE SUNN PEST, *EURYGASTER INTEGRICEPS* PUTON (HEMIPTERA: SCUTELLERIDAE) IN CEREAL FIELDS IN NORTHERN CYPRUS

Mustafa GÜLLÜ*[1], Celalettin GÖZÜAÇIK[2],
Ayda KONUKSAL[3], Hakan FİDAN[1], Hakan HEKİMHAN[4]

[1] Biological Control Research Station, Adana, Turkey
[2] Igdir University Faculty of Agriculture, Department of Plant Protection, Igdir, Turkey
[3] Agriculture Research Institute, Lefkoşa, Turkish Republic of Northern Cyprus
[4] Ege Agriculture Research Institute, Plant Protection Department, Izmir/Turkey
e-mail: mgullu83@hotmail.com

Abstract

This study was conducted to determine the distribution of Sunn Pest, *Eurygaster integriceps* Puton (Hemiptera: Scutelleridae) and its parasitoids in the cereals of Turkish Republic of Northern Cyprus between 2012-2014. For this purpose, in the cultivated fields of wheat, barley, oat and triticale in the district of Nicosia (Lefkoşa), Famagusta (Gazimağusa), Kyrenia (Girne), Morphou (Güzelyurt) and Trikomo (İskele) some surveys were made in the tillering and heading periods. To determine the distribution of overwintered adult Sunn pests, 100 *E. integriceps* were randomly caught in each field by a sweep net. The eggs parasitized by the wasps were collected from each cereal fields for determining parasitoid species. The collected overwintered adult Sunn pests, and the eggs parasitized by the *Trissolcus* wasps were cultured at room temperature and humidity. As a result of this study, the Sunn pest, *E. integriceps* have been found to be widespread in all cereal fields in Northern Cyprus. In this study, *Heliozeta hellou, Trissolcus semistriatus* and *T. grandis* were determined as the parasitoid species of Sunn Pest, *E. integriceps. Heliozeta helluo* Fabr. (Diptera, Tachinidae), *Trissolcussemistriatus* (Nees.), and *T.grandis* (Thomson) (Hymenoptera, Scelionidae) constitutes a first record for the Island of Cyprus.

Key words: Sunn Pest, *Eurygaster integriceps*, cereal, distribution, parasitoids, Northern Cyprus

THE DETERMINATION OF RATES INFECTION AND DAMAGE OF THE ALFALFA SEED CHALCID, *BRUCHOPHAGUS RODDI* GUSSAKOVSKIY, 1933 (HYMENOPTERA, EURYTOMIDAE) ON ALFALFA SEED STORED IN THE EASTERN REGION OF TURKEY

Celalettin GÖZÜAÇIK*, Abdullah İREÇ

Igdir University Faculty of Agriculture, Turkey
e-mail: cgozuacik46@gmail.com

Abstract

This study was conducted to determine the infection and damage rates of the alfalfa seed chalcid, *Bruchophagus roddi* Gussakovskiy, 1933 (Hymenoptera, Eurytomidae) on stored alfalfa seeds at 22 locations in Iğdır, Kars and Van provinces in the Eastern Anatolia region in the years 2013-2014. In the study carried out for the first time in Turkey, a total of 230 samples were collected with average amount of 100 g from commercial and domestic alfalfa seeds for each location. These seeds were cultivated at 25±1°C and 65±5% r.h.in the laboratory. With the aim of determining the infection and damage rates, the adult insects emerging, the damaged and non-damaged seeds were counted and weighed for each sample. Consequently, it was determined that 73.48% of those samples collected for the study were infected with B. roddi and average of 17534 seeds in those samples were damaged at the rate of 0.23% and the infection caused weight loss of 0.22 %.

Key words: Stored alfalfa seeds, *Bruchophagus roddi*, infection and damage rates, Eastern region Turkey

THE DETERMINATION OF DISTRIBUTION AND INFESTATION RATES OF THE ALFALFA SEED CHALCID, *BRUCHOPHAGUS RODDI* GUSSAKOVSKIY, 1933 (HYMENOPTERA, EURYTOMIDAE) IN ALFALFA (*MEDICAGO SATIVA* L.) FIELDS OF IGDIR PROVINCE OF TURKEY

Celalettin GÖZÜAÇIK, Mustafa AÇIKGÖZ

Igdir University Faculty of Agriculture, Turkey
e-mail: cgozuacik46@gmail.com

Abstract

Alfalfa seed chalcid, *Bruchophagus roddi* Gussakovskiy, 1933 (Hymenoptera: Eurytomidae) is an important pest in alfalfa fields. This study was conducted in order to determine distribution and infection of *B. roddi* in 28 alfalfa fields of Igdir province in August 2014. 250 ripe pods were collected randomly from each field. One hundred pods collected from each field were examined under a binocular microscope and the distribution and infestation rates of *B. roddi* by counting larvae-without larvae seeds were determined. It was determined at the end of the study that *B. roddi* was found in all the fields examined in the study and its infection rate ranged between 4.64 to 42.89%. In addition, the study was the first report to refer *B. roddi* for alfalfa fields of Igdir province.

Key words: Alfalfa fields, *Bruchophagus roddi*, distribution, infection rates, Igdir, Turkey

A NEW PEST: RUSH VENEER, NOMOPHİLA NOCTUELLA DENİS & SCHİFFERMULLER, 1775 (LEPİDOPTERA: CRAMBİDAE) ON ALFALFA (MEDİCAGO SATİVA L.) İN IGDİR PROVİNCE, TURKEY

Celalettin GÖZÜAÇIK

Igdir University Faculty of Agriculture, Turkey
e-mail: cgozuacik46@gmail.com

Abstract

Rush Veneer, *Nomophila noctuella* Denis & Schiffermüller, 1775 (Lepidoptera: Crambidae) is a pest that feeds with grass-pasture forage plants in many countries. The aim of this study was to determine its biology, its damage state and larvae parasitoids on alfalfa (*Medicago sativa* L.) fields of Iğdır province in the year 2014. For this purpose, a survey was performed every 3 days in May and June. In the survey, each field was monitored and the larvae were collected from alfalfa fields and kept in boxes covered with nets in the laboratory at 25±1^{0}C and 65±5% r.h. and following pupation, adult moths and larvae parasitoids were obtained. During the survey conducted in alfalfa fields, the larvae of the pest preferred alfalfa fields planted in April and damaged the plantation at changing rates by cutting-eating 3-5 cm of the upper part of the root of alfalfa plants at the height of 7-10 cm. From the larvae cultivated in the laboratory, some parasitoids belonging to the family Ichneumonidae (Hymenoptera) were also obtained in the study. As a result, the present study revealed that Rush Veneer, *N. noctuella* was recorded for the first time in Igdir province of Turkey on alfalfa plants.

Key words: *Nomophila noctuella*, new pest, alfalfa, larval parasitoids, Igdir, Turkey

FEATURES OF THE FORMATION OF THE PHENOLIC COMPLEX OF SOME FRUIT PLANTS

Mariia MERTVICHSHEVA*, Svetlana MOTYLEVA

All-Russian Horticular Institute for Breeding,
Agrotechnology and Nursery
e-mail: denkviz@yandex.ru

Abstract

Biochemical studies have an important place in the comprehensive study of plants. They allow you to predict the rational ways to use plant resources, starting with a preliminary determination of biologically active substances and ending with the study of their metabolism. Phenolic compounds are involved in almost all stages of plant metabolism. The share of this group of substances necessarily is to 2-3% by weight of organic substances of plants, and in some cases - to 10% or more. It is known that PS is inherent taxonomic specificity, which determines the ability of plants of different species, in spite of the different ecological and historical origin, the characteristic accumulation of metabolites similar to the qualitative composition. Secondary metabolites including flavonoids and phenolic acids are used as chemical markers in the "print" in the construction of "the biochemical profile." The changes in their composition and quantity distinguish species.

In this regard, relevant is the study of the peculiarities of formation (accumulation) of phenolic compounds, in conjunction with the development of methodical maintenance.

The objects of the study were blackberry leaves grown in different eco-geographical zones.

In the study of the qualitative composition of phenolic complex, blackberry leaves used their water-alcohol extracts. In view of the complexity of mixtures of natural extracts, analysis was performed by HPLC. The mobile phase used AcN: TFA (0,03%). This resulted in the chromatogram which identified your profile characteristic -rutin compounds, chlorogenic acid and quercetin. (Figure 1). These compounds were selected for further identification by the «fingerprint». Thus, by using HPLC method to allocate several typical culture flavonoids and by «fingerprint» it shows the similarity of the components and quantitative differences in their content.

Key words: HPLC, natural phenolic compounds, method «fingerprint»

GERMINATION AND GROWTH OF *DATURA STRAMONIUM* L. (JIMSONWEED) IN REGION OF PRISHTINA

Arben MEHMETI*, Enver SHERIFI, Zekije UKSHINI, Adem DEMAJ

Faculty of Agriculture and Veterinary, University of Prishtina "Hasan Prishtina"
e-mail: arben.mehmeti@uni-pr.edu

Abstract

This study has investigated the germination and growth of *D. stramonium* originating from three regions of Kosovo. *D. stramonium* (Jimsonweed) is one of the most important weed species on arable lands of Kosovo. This weed species causes yield depression, contaminates fodder and negatively affects growth and reproduction of other weed species. To counteract these problems, specific strategies need to be developed. Seeds of *D. stramonium* were harvested in three sub-regions of Kosovo (western, eastern and south-eastern parts) differing in climate and land use. They were set for the germination experiment in pots under field conditions in region of Prishtina. For each sub-region we prepared five pots filled with sterilized soil and sowed ten seeds for each pot. From May to September 2007, i.e. during the whole season, we conducted a seed germination experiment and measured weekly growth of *D. stramonium*. Seeds originating from the western part of Kosovo had higher germination of 62,0%, from eastern part 58,0% and lowest from the south-eastern part 52,0%. The weekly growth of *D. stramonium* differed between the regions, during the experiment. The highest growth in the end of the experiment have had plants from the region of south-eastern part 28,89 cm, western part 28,53 cm, and lowest from the eastern part 26,11 cm. The results are discussed in the context of the need to develop weed management strategies against this important weed species in Kosovo.

Key words: seed, region, weed ecology

DETERMINATION OF THE STRIPE RUST REACTIONS OF SOME BREAD WHEAT (*TRITICUM AESTIVUM* L.) GENOTYPES UNDER FIELD CONDITIONS

A. TÜLEK*[1], Z. MERT[2], K. AKAN[2], L. ÇETIN[2], İ. ÖZTÜRK[1], R. AVCI[1]

[1] Thrace Agricultural Research Institute,
D-100 karayolu uzeri Edirne, Turkey
[2] The Central Research Institute for Field Crops, Sehit Cem Ersever Cd. No. 9-11, Yenimahalle, Ankara, Turkey,
e-mail: adnantulek@gmail.com

Abstract

Bread wheat is the most important crop in Thrace region of Turkey. Thrace Agricultural Research Institute (TARI) located on Thrace region carries out breeding, seed production and extension works in the main crops of Thrace region such as bread wheat and barley. Stripe rust caused by *Puccinia striiformis* f.sp. *tritici* is very important and destructive foliar disease of wheat.

This study was carried out to determine stripe rust resistance of some bread wheat genotypes in 2006-2007 growing season in Ankara (Ikizce). The experiment was established with 6 cultivars and 14 lines in 1m long with 1 row and 2 replications in October 2006. Susceptible cultivars Seri 82, Michigan Amber and Little Club, were sown around the experimental field. Yellow rust spore suspensions in mineral oil (Soltrol 170®) were inoculated to plants at two different times. Reaction types and severity based on the Modified Cobb scale were recorded for scoring. Genotypes were scored at least two times consecutively and the highest scores were used for selection. Coefficient of infections (CI) was calculated and values below 20 were considered to be resistant.

According to the results, significant differences were found among genotypes. Pehlivan, Tekirdağ and Aldane were resistant to stripe rust. Both varieties, Aldane and Pehlivan, have been extensively growing where stripe rust is epidemic. Addition to the cultivars, some of the advanced lines were found resistant to stripe rust. These genotypes can be used as resistance sources in the crossing program.

Keywords: Bread wheat, stripe rust, *Puccinia striiformis* f.sp. *tritici*, resistant,

IDENTIFICATION OF PATHOGENS OF FUNGAL DISEASES CAUSED ROOT AND CROWN ROT ON BARLEY (*HORDEUM VULGARE* L.) IN NORTHERN CYPRUS

Hakan HEKIMHAN*, Hakan FIDAN, Ayda KONUKSAL,
Mustafa GULLU, Celalettin GÖZUACIK

Aegean Agricultural Research Institute, Izmir, Turkey
e-mail: hakanhekimhan@hotmail.com

Abstract

A survey study was carried out to determine the level of root and crown rot fungal diseases and to identify of fungal pathogens in the barley fields of Northern Cyprus (TRNC) in 2011-2012 and 2012-2013 growing seasons. For the first and second years, 57 fields and 39 fields were examined between milky and dough stages (Zadoks 61-79) respectively. At the end of the study, the disease symptoms were observed in 27 fields (47,4%) in 2012 and 15 fields (38,5%) in 2013. Average infected plant ratio was determined in diseased fields as 38 % in 2012 and 27 % in 2013. Root and crown rot disease severities in the barley cropping areas of Northern Cyprus were determined as 17% in 2012 and 11% in 2013. Average diseases severity was 14% in inspected fields for two years. Pathogens causing the diseases were determined as *Fusarium* sp., *Bipolaris* sp., *Sclerotium* sp., *Rhizoctonia* sp., *Colletotrichum* sp., *Cephalosporium* sp., *Pythium* sp. and *Alternaria* sp. The most common pathogens were found as *Fusarium* species. In vegetation period between November to May recorded average climate datas were as follows; (2012-2013); precipitation 439 (483,1-394,9 mm), average temperature 14,8 (13,9-15,8 ° C) and humidity 66,8 (66-67,5%). As a result, The root and crown rot diseases in these areas can cause essential yield and quality problems. Rotation doesn't apply in these areas due to drought and salinity. Drought and salinity tolerant alternative crops should be determined and should be grown for rotation.

Key words: Barley, Fungi, Northern Cyprus, Root and Crown rot,

ENVIROMENTAL PROTECTION AND NATURAL RESOURCES MANAGAMENT

CALCULATION OF SOIL EROSION INTENSITY IN THE NEDAKUSI WATERSHED OF THE POLIMLJE REGION, MONTENEGRO

Velibor SPALEVIC*[1], Milic CUROVIC[2], Aleksandar ANDJELKOVIC[3], Vojislav DJEKOVIC[3], Sasa ILIC[4]

[1] Institute of Forestry, Montenegro,
[2] Biotechnical faculty, University of Montenegro, Montenegro
[3] Faculty of Forestry, University of Belgrade, Serbia
[4] RAVIL, Cetinje, Montenegro
email: velibor.spalevic@gmail.com

Abstract

Soil erosion on agricultural land is a growing problem in the South Eastern European Region and is a threat to soil quality and to the ability of soils to provide agricultural services. The negative impact of sediments on the environment and water resources is widely acknowledged with many watercourses in Montenegro. In this context risk-assessment procedures using of computer-graphic methods have been introduced in the Polimlje region of Montenegro to help policymakers to recognise sites where either certain crops should not be grown or anti-erosion measures are required. We used modelling of sediment yield and runoff for calculation of soil erosion intensity for a Nedakusi watershed. Physico-geographical inputs, which are the basis for the calculation of soil erosion intensity, are included in the IntErO simulation model, with the Erosion potential analytical method of Gavrilovic embedded in the algorithm of this computer-graphic method. Our results shown that the net soil loss was calculated on 167 m³ per year, specific 54 m3km-2 per year. The results of this study are the determination of erosion processes in the studied watershed; new information about the recent state of the runoff and a sediment yield in formats that can facilitate its efficient management and protection, illustrating the possibility of modelling of sediment yield with such approach.

Key words: Erosion, Soil erosion assessment, watershed, Land use, IntErO model.

CALCULATION OF SOIL EROSION INTENSITY IN THE S1-6 WATERSHED OF THE SHIRINDAREH RIVER BASIN, IRAN

Morteza BEHZADFAR[1], Nevenka DJUROVIC[2], Ivan SIMUNIC[3], Milica FILIPOVIC[4], Velibor SPALEVIC*[5]

[1] Natural Resources and Watershed Management Head Office, Iran
[2] Faculty of Agriculture, University of Belgrade, Serbia
[3] Faculty of agriculture, University of Zagreb, Croatia
[4] Plantaze A.D., Podgorica, Montenegro
[5] Institute of Forestry, Montenegro
email: velibor.spalevic@gmail.com

Abstract

Soil erosion on agricultural land especially steep slopes and dry ones is the main problem in Iran and is a threat to soil quality and to the ability of soils to provide agricultural services and may cause to endanger food security. The negative on-site and off-site impact of sediments on the environment and water resources is widely acknowledged with many watercourses in Iran. In this context rapid risk-assessment procedures using of computer-graphic methods have been introduced in the Shirindareh region of Iran to help policymakers to recognise sites where either certain crops should not be grown or anti-erosion measures are required. We used modelling of sediment yield and runoff for calculation of soil erosion intensity for a S1-6 watershed. Physico-geographical inputs, which are the basis for the calculation of soil erosion intensity, are included in the IntErO simulation model, with the Erosion potential analytical method of Gavrilovic embedded in the algorithm of this computer-graphic method. Our results shown that the net soil loss was calculated on 8437.09 m³ per year, specific 200.88 m3km-2 per year. The results of this study are the determination of erosion processes such as type and strength in the studied watershed; new information about the recent state of the runoff and a sediment yield in formats that can facilitate its efficient management and protection, illustrating the possibility of modelling of sediment yield with such approach.

Key words: erosion, soil erosion assessment, watershed, land use, IntErO model.

ASSESSMENT OF OLD BULGARIAN OAT GENOTYPES FROM NATIONAL GENBANK

Mariya MANGOVA* , Nadezhda ANTONOVA

Institute of Plant Genetic Resources ,
Agricultural Academy of Bulgaria
email: blend_bg@yahoo.com

Abstract

Plant genetic resources are in the base of creating new adaptive varieties. In two crop years old Bulgarian oat varieties and populations from the collection of National Genbank have been evaluated. The genotypes were characterized as very early ripening, but having negative stem height-grain yield correlation. Percentage of husks was low to average 26.81%, 1000 grain weight 31.1 % – average, second leaf from the top -length 27.24 cm and width 1.454 cm were small to average. The grain of all local oat genotypes showed high crude protein 16.6 % and high lysine 0.574 % content. It was found a significant variation at the traits connected with productive potential - seed weight, weight of panicle, number of fertile spikelets and number of non-fertile spikelets, but it was insignificant with length of second leaf from top, days to heading, crude protein content and test weight.

Key words: oat, fertile spikelet, husk, protein

CONSERVATION AND UTILIZATION OF FRUIT GENETIC RESOURCES AS A CONCEPT OF RURAL SUSTAINABLE ECONOMIC DEVELOPMENT

Vladislav OGNJANOV*, Goran BARAĆ, Jovana DULIĆ, Maja MIODRAGOVIĆ

Faculty of Agriculture, Novi Sad, Serbia
e-mail:vognjanov@polj.uns.ac.rs

Abstract

Thanks to the unique diversity, the Balkan Peninsula could be considered as secondary center of genetic diversity for several fruit species, such as *Malus* x *domestica, Pyrus communis, Sorbus domestica, Prunus cerasifera, P. persica, P. armeniaca, P. cerasus, P. avium, P. fruticosa, P. amygdalus, P. nana, Juglans regia, Corilus colurna, Castanea sativa, Fragaria vesca, Cornus mas, Rosa sp., Sambucus nigra* and *Morus alba*. Conservation, utilization and sustainable use of its natural resources in West Balkan countries could play central role in sustainable rural development and economic growth through wise use of natural resources. But, they have never been a field for dismantling the divide between indigenous and scientific knowledge.

The main aim of the research was to connect in *situ/on farm* conservation and evaluation of fruit germplasm with ethno botanical heritage of nations and ethnic minorities. The main outcome of the research is improved *in situ/on-farm* management and evaluation of genetic resources by the farming sector and derived products with enhanced health benefits for consumers as a foundation for economic benefits for farmers. Diversification of such products comes from the traditional ways of fruit processing in ethno botanical heritage of living nations and ethnic minorities. Socio-economic dimension have its relevance in farming innovations, diverse product outcomes as a foundation for regional networking between farms, within and between regions, leading towards a recognizable food chain. It is a precious possibility to improve the quality of life and economic well-being of people living in relatively isolated and sparsely populated areas.

Key words: fruit species, germplasm, conservation, utilization

SPATIAL DISTRIBUTION OF TRACE ELEMENTS IN SOIL AND TOBACCO LEAVES FROM SKOPJE PRODUCTION REGION

Valentina PELIVANOSKA*[1], Biljana JORDANOSKA[1], Marin HRISTOVSKI[2]

[1] Scientific Tobacco Institute, University "St. Kliment Ohridski"– Prilep, Laboratory of Quality Control of Soil, Water, Fertilizer and Plant material, Kičevska bb, 7500 Prilep, Republic of Macedonia
[2] Socotab DOO – Bitola
e-mail: vpelivanoska@yahoo.com

Abstract

The purpose of this research was to determine spatial distribution and correlation between heavy metals content (Pb, Cd, Zn, Cu, Mn and Fe) in the soil and tobacco leaves in some production regions from Skopje. 39 soil samples and 117 leaves were taken for carrying out this research. Based on the agro-chemical analysis, the tested soils contain all nutrients within the necessary limits for producing oriental tobacco with good quality and quantity. It can be concluded that the soils in this region are not contaminated with lead, zinc, copper and cadmium and do not threat the production of tobacco and other agriculture crops. In part of the tested soils Mn and Fe presence is above the allowed limits, which is probably result of the secondary pollution from the traffic and industry. According to the results from heavy metal content in tobacco raw, it can be concluded that the content of lead, cadmium, manganese and iron from several, smaller production sites is above maximum allowable concentration, but is close to the obtained results by several researchers. According to the correlation analyses, soil parameters (clay and humus) have more prominent influence on the content of the Pb, Cd, Cu and Zn in the soil. Soil parameters showed weak correlation only with the lead and copper in the tobacco plants. There is no significant correlation between the content of heavy metals in the soil and in tobacco plants.

Key words: soil, tobacco, trace elements

BIOCHEMICAL ANALYSIS OF WILD CHERRY FRUITS (PRUNUS AVIUM L. /MOENCH./) IN POTKOZARJE AREA

Jelena NINIĆ-TODOROVIĆ*, Dejan PRVULOVIĆ, Đorđe MALENČIĆ, Vladislav OGNJANOV, Jelena ČUKANOVIĆ, Aleksandar KURJAKOV

University of Novi Sad, Faculty of Agriculture, Serbia
e-mail: jelena@polj.uns.as.rs

Abstract

Wild cherry trees (*Prunus avium* L. /Moench/) were selected from the population that belongs to forest communities of the chestnut and sessile oak (*Querco Castanetum sativae* Wrab.) in the area of Potkozarje. The site is located in the northwest part of Republic Srpska on Gradina territory at the altitude of 290 to 390 meters. Gradina is private property and the trees in the forest are from generative origin.

Selected wild cherry trees on the site Gradina are different classes of age, indicating the diversity of the population. Fruits were collected during 2011-2012 season.

Results of phenolic content in fruits of wild cherry (*Prunus avium* L. /Moench./) on acid soil were compared with the results of phenolic content in fruits of sweet cherry cultivars grown on chernozem soil type near Novi Sad city (Prvulović et al., 2012),.

Total phenolic content ranged from 185,00 (Genotype 10) up to 488,59 (Genotype 6) mg GAE/100 g of fresh fruit weight. Content of total tannins ranged from 69,88 (Genotype 8) to 202,84 (Genotype 6) mg GAE/100 g of fresh fruit weight.

Key words: Wild cherry, natural populations, phenols, tannin, biochemical compound.

EFFECTS OF FOLIAR FERTILIZATION ON MICROELEMENTS IN MAIZE LEAF

Hristina POPOSKA*[1], Marina STOJANOVA[2], Dusko MUKAETOV[1], Silvana MANASIEVSKA SIMIK[2], Marjan ANDREEVSKI[1], Tijana SEKULOSKA SIMONOVIKJ[1]

[1] Institute of Agriculture, University "Ss. Cyril and Methodius"
[2] Faculty of Agricultural Sciences and Food,
University "Ss. Cyril and Methodius"
Skopje, R. of Macedonia
email: hristinapoposka@hotmail.com

Abstract

The presented data were collected within the experiments carried out in Skopje region, R. of Macedonia, at the experimental fields of the Institute of Agriculture. The experiment with corn plant was conducted to study the effect of different concentrations of foliar fertilizer Megagreen on the content of some microelements in corn leaf during 2008 and 2009. The method of random block system with four variants in three replications was used for design of the field examinations.

Foliar treatments of three levels of Megagreen (0.3, 0.6 and 0.9 percent) and control (without fertilization), started from the stage 7-8 leaves, in intervals of 10-15 days.

The impact of different concentrations of fertilizer on content of micro elements in leaves at sillking stage and at the end of vegetation, were estimated with chemical analysis of plant material (leaf samples). The results gained from the laboratory analysis, showed that at sillking stage, variant 2 (fertilizing with concentration of 0.3%) has the highest concentration of Fe (183.67 mg/kg), Mn (89 mg/kg) and Zn (51.17 mg/kg). The highest concentration of Cu (13.33 mg/kg) was observed in the variant 3, treated with concentration of 0.6% Megagreen.

The results obtained from tissue analysis at the end of vegetation, showed that foliar application of Megagreen, has influence on concentration of Fe (335.33mg/kg) and Zn (55.5mg/kg) at variant 2 – (0.3% solution). Foliar application didn't show influence on copper and mangane content in the leaf.

Key words: fertilizer, foliar, concentration, leaf, microelements

EFFECT OF BORON – CONTAINING FERTILIZERS ON YIELD AND QUALITY OF TEA LEAF ON RUSSIAN BLACK SEA COAST

L.S. MALYUKOVA*, Z.V. PRITULA, N.V. KOZLOVA, A.V. VELIKIY

The State Research Institution All–Russian Scientific and Research Institute of Floriculture and Subtropical Crops of the Russian Academy of Agricultural Sciences,354002, Krasnodar region, Sochi, Yana Fabritsiusa str. 2/28
e-mail: malukovals@mail.ru

Abstract

The Black Sea coast of Russia is the only one in the country and the world's most northern area where tea is cultivated on an industrial scale. Prolonged use of mineral fertilizers has led (due to the increased soil acidity) to the increase in the mobility of some elements (Ca, Mg, Mn, Fe, Al, Cu, Zn), changed the balance of nutrition elements in soil-absorbing complex and some other soil properties. Furthermore, applying high doses of mineral macrofertilizers in fertilizer systems of tea usually leads to declines in tea quality, one of the reasons is reduce of microelements in tea raw materials. In this regard, the task is to develop the most effective agrochemical methods of increasing yield, quality of tea leaves as well as to preserve fertility in unique soils.

The studies were conducted during 2008-2013 based on the field experiment, which was pledged on a tea plantation in 2003 and included a regionalized cultivar called Colkhida (planted in 1983) on the Russian Black Sea coast. Boric acid (B - 6 kg/ha of active substance) were added to the soil surface on the background of N240P70K90.

Soil fertilization with boron 6 kg/ha of active substance, respectively on the Black Sea coast of Russia provided tea plantation productivity to 34%, increasing the content of tannins in 3-leaf fleches and, to a lesser extent extractives, which characterize the quality of tea raw material.

Key words: tea, micronutrient, acidic brown forest soil, Black Sea coast of Russia.

ECOLOGICAL ASPECTS OF PRESERVATION AND FERTILITY INCREASE OF IRRIGATED SOILS IN THE SOUTH OF UKRAINE

T.V. MALYUK, N.G. PCHOLKINA, I. PACHEV*

Melitopol research fruit growing station named after M.F. Sidorenko of Institute of Horticulture of National academy of agrarian sciences of Ukraine
*Institute Viticulture and Enology, Pleven, Bulgaria
e-mail: iv_pachev@abv.bg

Abstract

The results of the research of studying anthropogenic influence, particularly long-term irrigation of orchards with water of increased mineralization, fertilizers application and the soil management system in the orchards, upon certain indexes of agroecological state of chernozem soils in the South of Ukraine, on contents and distribution of water-soluble salts, humus and nitrates, as well as changes in the contents of soil absorbing complex are given. Based on many years of research, measures for saving of chernozem soil fertility in long-term fruit agrocenosis are developed.

Key words: soil fertility, humus, agroeclogy, chernozem soil

ISOLATION AND SCREENING OF FREE-LIVING NITROGENFIXING BACTERIA FROM DIFFERENT SOIL SAMPLES, AS PLANT GROWTH PROMOTERS

Iliyana VALCHEVA*, Donka DRAGANOVA, Yordanka KUZMANOVA, Mladen NAYDENOV

Agricultural university of Plovdiv, Bulgaria
e-mail: valchevailiana1@gmail.com

Abstract

Plant growth-promoting rhizobacteria (PGPR) are beneficial bacteria that colonize plant roots and enhance plant growth by a wide variety of mechanisms. The use of PGPR is steadily increasing in agriculture and offers an attractive way to replace chemical fertilizers, pesticides, and supplements.

Plant growth promoting bacteria can enhance and promote plant growth and development in different ways. These include production of phytochormones, solubilization of phosphorus, nitrogen fixation and biocontrolling effects on phytopathogenic microorganisms.

In this study thirty rhizobacterial strains, isolated from different soil samples, were screened for L-tryptophan (L-TRP) – depending indole acetic acid (IAA) production, phosphate-solubilizing activity, production of biocontrol compounds, such as chitinolytic, cellulolytic and gelatinolytic enzymes. The rhizobacteria isolates producing IAA were tested for seed germination and root elongation ability.

Results of the laboratory study showed that twenty-one rhizobacterial strains were able to produce indol acetic acid (IAA). Four isolates were able to solubilize insoluble phosphate as evident by production of clear zone on Pikovskaya's agar. They were analyzed for inorganic P concentration colorimetrically by the molybdenum-blue method.

Five isolates showed chitinolytic activity on solid medium by producing halo. Six strains demonstrated cellulolytic activity in the Congo Rod plate test. Only one of the tested rhizobacterial strains was able to produce gelatinolytic enzymes when using the Nutrient Gelatin stab method. All isolates were able to grow on N-free media.

Key words: PGPR, IAA, PSB, lytic enzymes

CONSERVATION AND CHARACTERIZATION OF APPLE AND PLUM AUTOCHTHONOUS VARIETIES IN MACEDONIA

Viktor GJAMOVSKI*[1], Marjan KIPRIJANOVSKI[2],
Aleksandar MARKOVSKI[1], Melpomena POPOVSKA[1], Tosho ARSOV[2]

[1] UKIM Institute of Agriculture, Skopje, R Macedonia
[2] UKIM Faculty of agricultural Sciences and Food, Skopje, R Macedonia
e-mail: v.gjamovski@zeminst.edu.mk

Abstract

Autochthonous fruit varieties present in R of Macedonia were mostly cultivated in extensive systems and usually they were not given enough attention. Mostly these varieties are grown in the village yards and near old churches. The aim of the study was to give description of morphological and pomo¬logical characteristics of some autochthonous apple and plum varieties. This paper considers identification and description of pomo¬logical characteristics of 6 autochthonous plum varieties and 14 autochthonous apple varieties found and grown in the territory of R. of Macedonia.

During two consecutive years, several collection missions in R of Macedonia have been performed. This activity includes marking of several potential, old apple and plum varieties and collection information about their origin. Observation and recording of their phenological and pomological traits were performed using IBPGR and UPOV methodologies. All founded cultivar differ in their phenology and pomology. Most of them can be used for processing and can find usage in production of local products. With a respect, some of them can find place in future breeding programs.

Key words: fruit genetic resources, apple, plum, conservation

AN CONTRIBUTION TOWARDS STUDYING OF PRODUCTION CAPABILITIES OF ALBIC LUVISOLS IN REPUBLIC OF MACEDONIA

Marjan ANDREEVSKI*, Duško MUKAETOV
Ss.Cyril and Methodius" University, Institute of Agriculture-Skopje
e-mail: m.andreevski@zeminst.edu.mk

Abstract

On different locations of the country, 23 soil profiles of albic luvisols were excavated and morphologically described on the field. More than half of soil profiles (15) were under forest vegetation, 4 soil profiles were under grass and the other 4 on arable land. The investigated soils have favorable mechanical composition. The content of humus is on a satisfactory level in those soil profiles under forest and grass vegetation, while in the examined soil profiles of the cultivated areas, the humus content is low. In the upper part of the soil profile, the soils are well provided with total nitrogen. Soil reaction (pH) in water is slightly deteriorated. From data obtained for cation exchange capacity and the composition of the adsorbed ions, it can be concluded that there is no risk of shortage of calcium and magnesium for plant nutrition. From this research it can be concluded that the contents of easy available phosphorus is very low. The condition of easy available potassium is satisfactory. Main productive deficiencies which can be resolved with appropriate agro ameliorative measures are: insufficient content of organic matter on cultivated areas, the emphasized texture differentiation and unfavorable soil reaction in part of profiles and low content of easy available phosphorus. Soil erosion is another form of soil degradation of albic luvisols under cultivation and need an serious and systematic approach in diminishing its devastating influence on soil properties.

Key words: Albic luvisols, production capability, humus, phosphorus, potassium

ECOLOGICAL ASPECTS OF PRESERVATION AND FERTILITY INCREASE OF IRRIGATED SOILS IN THE SOUTH OF UKRAINE

Malyuk T.V., N.G. Pcholkina, Iv. Pachev*

Melitopol research fruit growing station named after M.F. Sidorenko
of Institute of Horticulture of National
academy of agrarian sciences of Ukraine
Institute Viticulture and Enology, Pleven, Bulgaria
e-mail: iv_pachev@abv.bg

Abstract

The results of the research of studying anthropogenic influence, particularly long-term irrigation of orchards with water of increased mineralization, fertilizers application, and the soil management system in the orchard, upon certain indexes of agroecological state of chernozem soils in the South of Ukraine, on contents of and distribution of water-soluble salts, humus and nitrates, as well as changes in the contents of soil absorbing complex are given. Based on many years of research, measures for saving of chernozem soil fertility in long-term fruit agrocenosis are developed.

Key words: soil fertility,humus, agroeclogy, chernozem soil

RURAL DEVELOPMENT AND AGRO-ECONOMY

FACTORS INFLUENCING THE DEVELOPMENT AND COMPETITIVENESS OF TABLE GRAPES PRODUCTION IN BULGARIA

D. DIMITROVA, I. SIMEONOV*, V. DIMITROV

Institut of Viticulture and Enology, Pleven, Bulgaria
email: iliannsimeonov@gmail.com

Abstract

This article discussed the development of the table grapes production during the 2002-2012 period. Trends in imports, exports and foreign trade balance of the table grapes trade are outlined. Permanent trend of decline of the table grapes produced in the country and growing import are testified to decreasing competitiveness of the sector. The influence of the main factors – harvested areas, average yields, concentration and specialization of production, supply chain organization and national policy are analyzed.

The main conclusion to be made is that the stabilization and development of table grape production could hardly be achieved without the provision of state support for the preservation and expansion of the production potential of the sector, increasing the level of productivity per unit area, raising profitability, diversifying production and market risks on farms and improving the quality and safety of the offered production.

Key words: table grape, production, competitiveness, factors