SOME WHEAT VARIETIES BEHAVIOR REGARDING THE ATTACK OF MAIN PATHOGENS UNDER CLIMATIC CONDITIONS FROM CENTRAL AREA OF MOLDAVIA, ROMANIA

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ABSTRACT. Due to the attack of the main pathogens agents in the wheat crop the wheat production is not exploited at the full potential. Powdery mildew, leaf spot and rust brown leaves are considered to be the most widespread and damaging diseases of wheat. In our country, the attack of these pathogens is present every year, with different intensities and it can cause production damages ranging from 3-4% to 20%. Due to this fact, the main attention of the farmers is to cultivate resistant wheat varieties to *Blumeria graminis* (DC.) Speer., *Septoria tritici* Rob. Desm. and *Puccinia recondita* Rob. et Desm. The main objective of this study was to evaluate the phytosanitary condition of 24 wheat varieties cultivated in 2011-2012 at the Ezăreni didactic Farm from University of Agricultural Sciences and Veterinary Medicine of Iaşi, Romania, localized in the central area of Moldavia. This study contains data regarding the spread and evolution of the main pathogens that were observed at the 24 wheat varieties studied. These varieties showed different reactions to different pathogens observed in the same environmental conditions thus some of them were resistant to *Blumeria graminis* (DC.) Speer. and *Septoria tritici* Rob. ex. Desm. attack, and some recorded a disease incidence of 18.75% at the *Puccinia recondita* Rob. et Desm attack.

Key words: Wheat diseases; Resistance; Attack level.

REZUMAT. Comportarea unor soiuri de grâu la atacul principalilor agenţi patogeni, în condiţiile din zona centrală a Moldovei, România. Atacul agenţilor fitopatogeni din cultura de grâu reprezintă una dintre cauzele datorită cărora producţia de grâu nu se valorifică la întregul potenţial. Făinarea, pătarea brună a frunzelor şi rugina grâului sunt considerate ca fiind cele mai răspândite şi păgubitoare boli ale grâului. În ţara noastră, atacul acestor agenţi patogeni apare an de an, cu intensităţi diferite, putând produce pagube cuprinse între 3-4%, pâna la 20% din producţie. Astfel, utilizarea soiurilor rezistente la atacul de *Blumeria graminis* (DC.) Speer., *Septoria tritici* Rob. ex. Desm. şi *Puccinia recondita* Rob. et Desm. figurează permanent în preocupările producătorilor de grâu. Acest studiu a fost realizat în vederea evaluării stării fitosanitare a 24 soiuri de grâu în condiţiile din zona centrală a Moldovei, iar observaţiile s-au efectuat în anul agricol 2011-2012, la Ferma didactică Ezăreni, din cadrul U.Ş.A.M.V. Iaşi. În lucrare sunt cuprinse date referitoare la răspândirea şi evoluţia principalilor agenţi patogeni, întâlniţi la cele 24 de soiuri de grâu luate în studiu. Aceste soiuri au manifestat reacţii diferite, în aceleaşi condiţii de mediu, concretizate prin faptul că unele au fost rezistente la atacul de *Blumeria graminis* (DC.) Speer. şi *Septoria tritici* Rob. ex. Desm., iar altele au înregistrat un grad de atac (GA%) de 18.75%, în cazul atacului de *Puccinia recondita* Rob. et Desm..

Cuvinte cheie: boli la grâu; rezistenţă; grad de atac.

EFFECTS OF SUPERABSORBENT AND IRRIGATION REGIME ON SEEDLING GROWTH CHARACTERISTICS OF BARLEY (*HORDEUM VULGARE* L.)

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ABSTRACT. Greenhouse experiment was carried out to study the effects of superabsorbent and water deficit stress on seedling growth of barley (*Hordeum vulgare* L.) in Urmia University of Iran. Three amounts of superabsorbent polymer (0 (S_1), 2 (S_2) and 4 g (S_3) were mixed with 500 g soil before sowing, and four levels of irrigation regimes (irrigation at 20 (I_1), 40 (I_2), 60 (I_3) and 80% (I_3) field capacity) were set as treatments. The root length, root volume, root and shoot dry weight, plant height, leaf length, leaf width, SPAD and root-shoot ratio were affected by treatments. Means comparisons indicated that the highest root length (19 cm) observed in the I_4 irrigation regime and the lowest of it (16.18 cm) obtained in I_1 condition. Barley plants that received 4 g and no superabsorbent had the utmost (1.13 cm) and lowest (0.54 cm) root volume, respectively. Whereas plant situated in I_4 and I_1 irrigation regimes produced greatest and smallest amount amount of shoot dry weight and SPAD. The maximum (12.83 cm) and minimum (8.33 cm) leaf length was obtained from S_3I_3 and S_1I_1 condition, respectively. Generally, the results showed the most of measured barley seedling traits in irrigation at 40 % field capacity (I_2) were the equal with I_3 and I_4 irrigation regimes treatments, which indicated the resistance of barley seedling to the water deficit stress. Also, we found that the improving of root dry weight and root volume of barley seedling along with increasing in the superabsorbent application.

Key words: Barley; Irrigation regimes; Root; Seedling; Superabsorbent.

EFFECT OF FOLIAR APPLICATION OF SILICON ON YIELD AND QUALITY OF RICE (*ORYZA SATIVA* L)

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ABSTRACT. A field experiment was conducted at University of Agriculture, Faisalabad, Pakistan, to investigate the effect of foliar application of silicon on yield and quality of fine rice (*Oryza sativa* L.). The research was designed as randomized complete block design (RCBD) having three replications and 6m x 4.5m net plot size was maintained. Foliar applications of silicon's aqueous solution were used as treatments comprised of control, 0.25%, 0.50%, 1.00% silicon solutions. Nursery of 30 days old seedling nursery was transplanted to the plots under aerobic condition and 22.5cm hill to hill distance was maintained. Sodium silicate (20.35% Si) as the source of silicon (soluble in warm water) was used. Fertilizer inputs as nitrogen, phosphorus and potassium were uniformly applied at the rate of 100, 67, 67 kg ha^{-1} while all other agronomic practices were kept constant for all the treatments. The data from the field (yield components) as well as lab analysis (quality parameters) was recorded according to the standard procedures. Fisher's analysis of the variance technique was used for statistical analysis and treatment's mean differences were compared using least significant difference (LSD) test at 5% probability level. Silicon showed no significant effect on plant height, harvest index, number of kernels and opaque kernels percentage. Silicon (0.50% silicon solution) produced maximum grain diameter and grain

protein while silicon @ 1.00% silicon solution resulted maximum in number of productive tillers, straw yield, spike per panicle, 1000 grain weight, paddy yield and grain starch. All others parameters have overlapping results of different silicon levels.

Key words: Rice; Micro nutrient; Silicon; Yield: Quality.

EFFECTS OF NITROGEN AND ZINC SPRAY ON YIELD OF CORN (*ZEA MAYS* L.) IN DROUGHT STRESS

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ABSTRACT. In hot and arid regions, drought stress is considered as one of the main reasons for yield reduction. To study the effect of drought stress, nitrogen and zinc spray on the yield and yield components of corn, an experiment was carried out during the crop seasons of 2010 and 2011 on Emam Khomeyni research Farm in Mahvellat as a split factorial within randomized complete block design with three replicates. The main plots with irrigation factor and three levels were considered: full irrigation, stopping irrigation at anthesis step and stopping irrigation at the seed filling stage. Subplots were considered with and without nitrogen and zinc spray. The drought stress reduced the grain yield in anthesis stage more than other stages. Drought stress effects significantly on stem and ear diameter, ear length, chlorophyll value, leaf area index, leaf relative water content, stem, ear and leaves dry weight, number grain in ear and row, number row in ear, unfilled seed percentage and thousand grains weight. Nitrogen increased the seed yield and yield component except thousand grains weight and the number of row in ear. Using Zn, as compared with control treatment, causes the increase of grain yield, thousand grains weight and number grain in ear 16.5, 9 and 5.5%, respectively. The results obtained from the present research showed that anthesis stage was most sensitive stage to drought stress. Also nitrogen and Zn could somewhat reduce the impact drought stress on corn.

Key words: Drought stress; Nitrogen; Zinc; Spray; Corn.

NITROGEN MANAGEMENT STUDIES IN MAIZE (*ZEA MAYS* L.) HYBRIDS

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ABSTRACT. A field experiment was conducted to study the effect of different nitrogen management methods on yield, yield components and quality attributes of maize hybrids (single cross-6142 and double cross-4444) under irrigated conditions. Nitrogen dose is met either by PM (poultry manure) or urea according to each treatment. PM was incorporated at the time of presowing irrigation whereas fertigation method at knee height stage and foliar spray at flowering were use for the application of urea. Results showed that plant height, cob diameter, number of grains per cob, grain yield and biological yield were significantly affected by the hybrids. Significantly, higher plant height, cob diameter, number of grains per cob, grain yield and biological yield were produced by single cross-6142. There was no significant difference

occur between both hybrids on seed oil and protein contents. N management by the application of T_3 (60% N from PM + 38.5% N from urea through fertigation + 1.5% N from urea through foliar application) produced significantly more plant height, cob diameter, number of grains per cob, grain yield, biological yield, seed protein and seed oil contents. The interaction of single cross-6142 and T_3 (60% N from PM + 38.5% N from urea through fertigation + 1.5% N from urea through foliar application) was found superior in production of more plant height, cob diameter and number of grains per cob. However, interaction between maize hybrids and N application methods for grain yield, biological yield, seed protein and oil contents was reported non-significant. It can be concluded that single cross hybrid-6142) and T_3 (60% N from PM, 38.5% N from urea through fertigation and 1.5% N from urea through foliar application) could be used successfully for improving maize yield under the irrigated conditions.

Key words: Maize; Poultry manure; Urea, Yield.

HORMONE PRIMING IMPROVES GERMINATION CHARACTERISTICS AND ENZYME ACTIVITY OF SORGHUM SEEDS (*SORGHUM BICOLOR* L.) UNDER ACCELERATED AGING

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ABSTRACT. Maximum germination percentage achieves immediately after harvesting and gradually decreases with storage time. Aging is one of the key factors in plant yield loss especially in vegetables. Seed aging is the main problem of seed storage. Application of accelerated aging treatment is used to assess seed vigor and quality. Seed priming enhances seed germination performance after aging. An experiment was conduct in order to investigate the activity of catalase and ascorbate peroxidase during accelerated aging and repair during priming treatment of sorghum seeds. In order to improve germination characteristics in aged seeds with seed priming. Our result showed that seed priming treatments significantly ($p \leq 0.01$) affected, germination percentage, germination index and means time to germination after aging (0, 3 and 6 days). Increasing aging duration resulted higher reduction in germination characteristics. Priming with gibberelic acid (GA), salicylic acid (SA) and ascorbic acid (ASC) increased germination characteristics of seed aged. The highest germination percentage, germination index, normal seedling percentage and enzyme activity were achieved in control conditions (0 day of aging). Antioxidant activity of aged seeds increased after seed priming.

Key words: Hormone priming; Seed characteristics; Enzyme activity; Accelerated aging.

IMPACT OF OPENED, NON OPENED POLLINATION AND NITROGEN FERTILIZER ON SESAME PRODUCTION IN THE RECLAIMED LANDS, ISMAILIA GOVERNORATE, EGYPT

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ABSTRACT. The research was conducted at the Agriculture Research Farm, Faculty of Agriculture, University of Suez Canal, during the sesame growing seasons of 2011 and 2012**.** For studying the impact of insect pollination and nitrogen fertilization on sesame production, the experiment was divided to 13 treatments of open pollination and non open pollination, with three different levels of ammonium nitrate (NH_4NO_3) and one level of seryalin as bio-fertilizer. Non opened pollination treatments were covered before the start of flowering period with a perforated net bag, to allow the air to pass through and to prevent insects from approaching the plants. Quantitative and qualitative indicators, were measured as follows: rate of capsule per plant, capsule weight, rate of seeds in each capsule, weight of 1000 seeds, germination (%), seedlings vigour and oil content (%). Results clearly demonstrate that qualitative and quantitative indicators of sesame crop was significantly increased with opened pollination and with the increase of nitrogen fertilizer level up to 40 kg N/ feedan^{-1} plus or minus seryalin, in reclaimed sandy soils, in Ismailia, Egypt.

Key words: Sesame crop; Fertilization; Insect pollination; Qualitative indicators; Quantitative indicators.

THE EFFECT OF LONG -TERM FERTILIZATION ON THE GRAIN BEAN HARVEST IN AGRICULTURAL RESEARCH - DEVELOPMENT STATION SECUIENI, NEAMŢ COUNTY, ROMANIA, CONDITIONS

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ABSTRACT. The application of chemical fertilizers on the grain bean crop must be done due to the plant peculiarities (high consumption of nutrients, root system underrepresented, plant ability to synthesize up to 85% of the needed nitrogen) and its high sensitivity to stress conditions. Although the bean requirements for nutrients are high, the plant response to the application of fertilizers is smaller, the obtained production increase will vary widely depending on the type of fertilizer, the applied dose, but also on the climatic conditions in the area. The paper presents the experimental results, carried aut during 2008-2010 at Agricultural Research-Development Station Secuieni, Neamţ County, Romania (A.R.D.S. Secuieni-Neamţ), on the application of phosphorus and nitrogen fertilizers in a long – term experiences. By using the two fertilizers were obtained yield increases of 3-27%. These were directly proportional to the dose of the applied fertilizer. By applying the phosphorus fertilizer, the average production increases, compared with the control variant, were ranged from 7 to 15%. Average gains, obtained by the using of nitrogen fertilizers, compared with the control variant, were ranged from 12 to 27%. Marginal production increases, obtained by applying phosphorus fertilizers were of 1,52-2,92 kg beans/ kg P_2O_5, and at the nitrogen fertilizers, of 1,72-3,28 kg beans/ kg N. In both cases, the marginal increases obtained were inversely proportional to the doses of the apllied fertilizer.

Key words: Fertilizers; Production; Limiting factor identification.

EFFECTS OF FENUGREEK AND DILL DIFFERENT INTERCROPPING PATTERNS AND HARVESTING TIMES ON ESSENTIAL OIL OF DILL

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ABSTRACT. Intercropping is an important and sustainable cropping practice in agroecosystems. Intercropping is a planting technique that farmers and gardeners can use to promote beneficial plant interactions and increases in biodiversity, enhanced production and lower economic risk. In the search for sustainable agricultural methods for medicinal plants, fenugreek and dill plants were intercropped at different additive (1:20, 1:40 and 1:60) and replacement (1:1, 1:2 and 1:3) series, at the Research Farm of the Faculty of Agriculture, University of Tabriz, Iran. Field experiment was arranged as split plot based on randomized complete block design in three replicates. Dill umbels were harvested at flowering, pasty and complete ripening stages. Results showed that among harvesting times, pasty stage had maximum essential oil percentage, essential oil yield and harvest index of essential oil, whereas among intercropping patterns, 1:1 and 1:20 treatments had the maximum values. Fenugreek as a medicinal, forage and legume crop promote dill essential oil yield and harvest index and could be an effective plant in intercropping systems.

Key words: Additive series; Intercropping; Multiple culture; Replacement series.

VITICULTURAL ZONING: A COMPARATIVE STUDY REGARDING THE ACCURACY OF DIFFERENT APPROACHES IN VINEYARDS CLIMATE SUITABILITY ASSESSMENT

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ABSTRACT. The paper presents the results of a study regarding the mesoclimate suitability assessment of three Romania's wine-growing centres (Urlaţi-Dealu Mare vineyard, Huşi-Huşi vineyard, Bucium-Iaşi vineyard), by the Huglin's heliothermal index and by a GIS based multicriteria method. The results are compared between the two types of analysis and with the macroclimate suitability map of Romania's wine regions, expressed by Huglin's heliothermal index spatial distribution. The research show that the values of Huglin's heliothermal index in Romania's wine regions varies between 2341.48 on the Danube Terraces from the southern limit of the country to lower than 1500 on the intra-mountainous wine region Transylvania. The prevailing climate class over the Romania's wine regions is IH-1 that define temperate climate. According to the assessment on Romania's macroclimate scale by Huglin's heliothermal index, the three wine-growing centers are characterized by temperate climate (IH-1), that indicate the existence of climate conditions for grapes maturation to Cabernet Sauvignon variety. The assessment on mesoclimate scale by the GIS based multicriteria method reveals a wider variability of local climate than that resulted from macroclimate and mesoclimate analysis by Huglin's heliothermal index, as follows: the climate of Urlaţi wine-growing center is suitable for quality red wines production; in Huşi wine-growing centre only 16.95% from the area has climate suitable to produce red table wines; the climate of Bucium wine-growing centre is not suitable for red wine production. Comparison with the Romania's vineyards wine production specialization confirms that the results of multicriteria GIS based evaluation reveal accurate the local climate suitability and demonstrate the need of the fine-scale assessment of vineyard climate in the viticultural zoning.

Key words: vineyard; climate; assessment; wines; Huglin's heliothermal index.

REZUMAT. Zonarea viticulturii: studiu comparativ privind acurateţea diferitelor abordări în evaluarea favorabilităţii climatului podgoriilor. În lucrare sunt prezentate rezultatele evaluării climatului centrelor viticole Urlaţi-podgoria Dealu Mare, Huşi-podgoria Huşi, Bucium-podgoria Iaşi, prin intermediul indicelui heliotermic Huglin şi a unei metodologii multicriteriale. Rezultatele celor două tipuri de evaluare sunt comparate atât între ele, cât şi cu harta favorabilităţii macroclimatului regiunilor viticole din România, exprimată prin valori ale indicelui heliotermic Huglin. Cercetarea arată că, pe teritoriul României, valorile indicelui heliotermic Huglin variază între 2341.48 în Regiunea viticolă a Teraselor Dunării şi mai puţin de 1500 în Regiunea viticolă a Podişului Transilvaniei. Conform evaluării la scara macroclimatului, exprimată prin valorile indicelui heliotermic Huglin, cele trei centre viticole analizate dispun de condiţiile climatice necesare producţiei de vinuri roşii din soiul Cabernet Sauvignon. Evaluarea la scara mezoclimatului (scara podgoriei) prin metodologia multicriterială relevă o variaţie mult mai largă a favorabilităţii climatului local decât cea rezultată din evaluarea macroclimatului pe baza indicelui heliotermic Huglin, după cum urmează: climatul centrului viticol Urlaţi este favorabil pentru producţia de vinuri roşii de calitate; în centrul viticol Huşi numai 16.95% din suprafaţă dispune de condiţii climatice favorabile producţiei de vinuri roşii; climatul centrului viticol Bucium nu este favorabil pentru producţia de vinuri roşii. Comparaţia cu harta direcţiilor de producţie a podgoriilor din România arată că rezultatele evaluării multicriteriale sunt corecte şi demonstrează necesitatea evaluării climatului podgoriilor la scară fină în cadrul lucrărilor de zonare a viticulturii.

Cuvinte cheie: podgorie; climat; evaluare; vinuri; indicele heliotermic Huglin.