INFLUENCE OF DIFFERENT TEMPERING PERIOD AND VACUUM CONDITIONS ON THE RICE GRAIN BREAKAGE IN A THIN LAYER DRYER

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ABSTRACT. Drying and milling of the paddy are known as the most important process influencing the rice grain breakage. Therefore in this study, influence of tempering period and the reduced atmospheric pressure (vacuum) on the crack formation of two rice varieties (Nemat and Pajouhesh) during the tempering stage is presented. Four different level of drying temperature (40, 50, 60 and 70°C) were used in this study. After drying, paddies have been transferred to a vacuum chamber ranging from 0.4 at to 1 atm (ambient pressure). Based on the results obtained in this study, crack formation in rice grains increases with increasing drying time and drying temperature. In contrast, a reduced pressure during the relaxation stage significantly reduced the rice grain breakage. During the relaxation period in the vacuum chamber, heat transfer within the rice grain occurs slowly, yields minimizing the thermal and moisture stresses. The optimized combination of temperature, time, and pressure for the Nemat and Pajouhesh rice varieties obtained 60°C, 5 hr, and 0.8 atm, respectively.

Key words: Rice; Tempering; Vacuum; Reduced pressure; Drying.

BEHAVIOR OF SOME ROMANIAN TRITICALE VARIETIES IN THE CLIMATIC CONDITIONS OF THE CENTER OF MOLDAVIA, ROMANIA

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ABSTRACT. Knowledge of the particularities of the new varieties response to environmental conditions is important for the best possible territorial zoning and site stating that they need to occupy in varieties structure for each area. This paper presents research results of environmental testing of six Romanian triticale varieties at the Agricultural Research-Development Station (A.R.D.S.) Secuieni, Neamţ county, Romania, during 2007-2012 and followed the zoning of the most adapted and performing genotypes, increasing their biodiversity, so as to diminish the genetic and environmental vulnerability of agroecosystems. On average for the five years of experimentation, triticale yields achieved ranged from 6984 kg/ha (Cascador) and 8439 kg/ha (Haiduc). Of the five years of experimentation, the crop years 2008-2009 and 2010-2011 were normal in terms of rainfall, the yields achieved in these years being the highest. Depending on the average yield achieved in the five years of experimenting, the top three varieties were ranked Haiduc (8439 kg/ha), Stil (8320 kg/ha) and Plai (7961 kg/ha), the first two varieties having a very low coefficient of variability (<10). During the experiment, Romanian triticale varieties showed good resistance to winter, lodging and diseases.

Key words: Climatic conditions; Yield; Ecological testing; Triticals.

REZUMAT. Comportarea unor soiuri romaneşti de triticale în condiţiile pedoclimatice din centrul Moldovei, Romania. Cunoaşterea particularităţilor reacţiei soiurilor noi la condiţiile de mediu este importantă pentru o cât mai judicioasă zonare în teritoriu şi pentru precizarea locului pe care acestea trebuie să-l ocupe în structura soiurilor pentru fiecare zonă. Lucrarea prezintă rezultatele cercetărilor de testare ecologică a şase soiuri de triticale la S.C.D.A. Secuieni, judeţul Neamţ, în perioada 2007-2012, şi a urmărit zonarea celor mai adaptate şi performante genotipuri, creşterea biodiversităţii lor, în aşa fel încât să se diminueze vulnerabilitatea genetică şi ecologică a agroecosistemelor. În medie pe cei cinci ani de experimentare, producţiile de triticale realizate au variat între 6984 kg/ha (Cascador) şi 8439 kg/ha (Haiduc). Dintre cei cinci ani de experimentare, anii agricoli 2008-2009 şi 2010-2011 au fost normali din punct de vedere al precipitaţiilor, producţiile realizate în aceşti ani fiind cele mai ridicate. În funcţie de producţia medie realizată în cei cinci ani de experimentare, pe primele trei locuri s-au clasat soiurile Haiduc (8439 kg/ha), Stil (8320 kg/ha) şi Plai (7961 kg/ha), primele două soiuri având şi un coeficient de variabilitate foarte mic (<10). În perioada de experimentare, soiurile româneşti de triticale au prezentat o rezistenţă foarte bună la iernare, cădere şi boli.

Cuvinte cheie: condiţii climatice; producţie; testare ecologică; triticale.

HEAT SHOCK TREATMENT CAN IMPROVE SOME SEED GERMINATION INDEXES AND ENZYME ACTIVITY IN PRIMED SEEDS WITH GIBBERELLIN OF MOUNTAIN RYE (*SECALE MONTANUM*) UNDER ACCELERATED AGING CONDITIONS

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ABSTRACT. Seed priming with gibberellin (GA) enhances seed germination performance; but the quality of primed seeds in aging condition often reduces more than non-primed seeds. An experiment was conducted to evaluate the effect(s) of heat shock treatments on germination characteristics and enzyme activity of primed mountain rye (*Secale montanum*) seeds with gibberellin under accelerated aging. Heat shock treatments, can substantially decrease the speed of quality reduction of mountain rye (*Secale montanum*) primed seeds. In primed seeds with gibberellin, which has non-aged, the highest germination percentage (GP) and normal seedling percentage (NSP) was attained from heat shock treatment at 35°C for 3 h, also after 3 days aging, it was attained from heat shock treatment at 35°C for 3 h. After 3 days of aging the highest germination index (GI) was attained from unprimed seeds, but no significant difference with heat shock treatment at 35°C for 3 h. The minimum means time germination (MTG) was in heat shock treatment at 30°C for 3 h in non-aged seeds. After 3 days of aging, heat shock treatment reduce MTG as compared to the primed seeds. Heat shock treatment at 35°C for 3 h increased seed vigor index (SVI) as compared to the unprimed and primed seed in non-aged seeds and after 3 days aging. Seedling length (SL) increases with heat shock treatment at 30°C for 4 h in non-aged seeds as compared to the primed and unprimed seeds, but after 3 days of aging heat shock treatment except at 35°C for 3 h and 40°C for 4 h reduced SL as compared to the primed and unprimed seeds. Also, heat shock treatments increase some antioxidant enzymes [Catalase (CAT), Ascorbat peroxidase (APX)].

Key words: Germination characteristics; Heat shock treatment; Priming; Catalase; Ascorbic peroxidase; Accelerated aging.

EFFECT OF ROW SPACING ON THE YIELD OF COTTON CULTIVARS

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hirsutum L.) cultivars with herbicide resistance have rejuvenated an interest in narrow row cotton production, primarily because of the reduction of weed control problems encountered in the past with narrow row systems. While the primary goal of narrow row cotton is to reduce production costs, an agronomic and physiological evaluation of this cropping system is also needed. The objectives of this study were to determine the feasibility of using modern cotton cultivars in narrow rows (30 cm) for cotton production in the Gonabad and to assess the effect of these various systems on cotton growth, lint yield, and fiber quality. Plant height, sympodia and total bolls per plant were reduced in cotton grown in narrow row spacing. In most cases, cotton grown in narrow rows had lint yields equal to or higher than those attained in the 70 cm spacing. modern cultivars in narrow row cotton production did not improve lint yield. No conclusions could be made regarding the impact of plant stature on lint yield. Row spacing had little impact on fiber quality narrow row cotton appeared to be a viable agronomic cotton production practice for the Gonabad compared with conventionally - grown cotton based upon lint yield and fiber quality.

Key words: Cotton; Lint yield; Cultivars; Narrow row spacing.

PERFORMANCE OF SOME ADVANCED GENOTYPES OF COTTON IN TERMS OF CMT, CLCuV AND YIELD

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ABSTRACT. Cotton leaf curl virus (CLCuV) and heat stress are the major threats to cotton productivity in Pakistan. Both these factors inflicted huge losses in recent years. Thirty one genotypes of *Gossypium hirsutum* L. were sown in the experimental area of Cotton Research Institute, Faisalabad, Pakistan, on 25th of May for the purpose of screening against aforementioned stresses. Analysis of variance revealed significant variation among the tested genotypes. Some of the genotypes showed promising results in terms of CLCuV and also showed fair stability of their membranes. The strain FH-142 showed excellent tolerance level against CLCuV and heat stress by showing the values of 0.4% for cotton leaf curl virus and membrane stability of 46.1%. The other genotypes that showed promising results in terms of CLCuV % are FH-330, MNH-886, MNH-814 and FH-312 and regarding heat stress MNH-456, FH-142, FH-118, CRSM-38 and NIAB-112 exhibited promising results by showing the CMT % of 46.4%, 46.1, 45.5, 45.5, 44.1, and 41.9%, respectively. The findings of the experiment may be helpful in designing breeding programmes regarding CLCuV and heat tolerance as material had considerable potential for better yield as well.

Key words: CLCuV%; CMT%; Cotton; Pakistan.

RELATIONSHIP BETWEEN SALT TOLERANCE RELATED PHYSIOLOGICAL TRAITS AND PROTEIN MARKERS IN SOYBEAN CULTIVARS (*GLYCINE MAX* L.)

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ABSTRACT. This study was conducted to evaluate the salinity tolerance in seedling stage of soybean (*Glycine max* L.). Factorial experiment was done based on randomized complete block design with three replicates. 17 soybean genotypes were used in three salinity stress levels (consisting of control, 75 mM and 150 mM NaCl stress). The experiment was carried out in a greenhouse condition and proline, sodium, potassium, and chlorophyll a, chlorophyll b, chlorophyll a/b and total chlorophyll content were examined. To create salinity stress, NaCl was used in the experiment. The results revealed that different salinity stress had significant effects on all traits except for chlorophyll b and chlorophyll a/b. The cluster analysis in the control and at 75 and 150 mM salinity levels classified genotypes into two, two and three groups respectively. In each condition, the dpx and clean genotypes were placed in a group which the average traits were higher than the other genotypes. This can be generalized to the conditions of control as well as 75 and 150 mM salinity stress. Regression analysis showed possible informative loci encoding protein markers that was probable potential for selection strategies for salt weather proved by complementary tests.

Key words: Protein marker; Salinity; Soybean.

COMPARATIVE PERFORMANCE OF VARIOUS SUNFLOWER HYBRIDS FOR YIELD AND ITS RELATED ATTRIBUTES

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ABSTRACT. An experiment to evaluate comparative performance of various sunflower hybrids for yield and its related attributes was conducted at the Agronomic Research Area, University of Agriculture, Faisalabad, Pakistan, during autumn 2008. Twelve sunflower hybrids, i.e. G-101 (H_1), DK-4040 (H_2), SF-187 (H_3), S-278 (H_4), Hysun-33 (H_5), FH-37 (H_6), Ausigold-61 (H_7), Ausigold-62 (H_8), FSS-50 (H_9), NX-00989 (H_{10}), NX-00997 (H_{11}) and XIYU-12 (H_{12}) were included in the trail. The experiment was laid out in randomized complete block design (RCBD), having three replicates with plot size of 5m x 3m. Statistical analysis of the data showed significant differences for all the parameters. It was observed that Hysun-33 showed greater plant height (148.47 cm) and achene per head (682.70) than all other hybrids, however in case of yield (3891.0 kg ha^{-1}) and other related traits such as number of plants m^{-2}, leaf area index, head diameter and 1000-achene weight SF-187 displayed better performance by recording values (6.87), (4.33), (18.62) and (49.11g), respectively, following Hysun-33 for most of the traits. From the results of experiment it can be concluded that the hybrids SF-187 and Hysun-33 showed high productivity and are best adapted to the climatic conditions of Faisalabad.

Key words: Sunflower; Hybrid; Performance; Yield.

THE COMMUNITIES STRUCTURE OF INVERTEBRATE FAUNA FROM RAPE AND ALFALFA CROPS (SINGURENI, GIURGIU COUNTY, ROMANIA)

Cristina FIERA, Dorina PURICE, Sanda MAICAN

ABSTRACT. The present study has been conducted under a bilateral project between Romania and Republic of Moldova, focusing on knowledge of the invertebrates from rape (*Brassica napus* L.) and alfalfa crops (*Medicago sativa* L.) from Singureni (Giurgiu County, Southern Romania). The communities structure of invertebrates fauna in term of species composition and numerical abundance were analyzed. In total, 15 species of Collembola from seven families and 38 species of Coleoptera from 17 families were identified. *Entomobrya handschini*, *Lepidocyrtus paradoxus, Isotoma anglicana* were abundant in the alfalfa crop and *Hemisotoma thermophyla*, *Protaphorura sakatoi, Orchesella flavescens* (Collembola) were abundant in the rape culture. From Coleoptera Order, *Dermestes murinus, Brachinus crepitans* and *Epicometis hirta* were dominant in the rape crop. *Coccinella septempunctata* and *Gonioctena fornicata* were dominant in the alfalfa. Also, another 385 specimens from different taxonomic groups (Heteroptera, Homoptera, Diptera, Hymenoptera, Thysanoptera, Orthoptera and Araneae) were collected using sweep nets. Some crop pests invertebrates were indicated and the beneficial predators were also revealed.

Key words: Alfalfa; Rape, Numerical abundance; Invertebrates.

REZUMAT. Structura comunităţilor faunei de nevertebrate din culturile de rapiţă şi lucernă (Singureni, judeţul Giurgiu). Studiul s-a realizat în cadrul unui proiect bilateral (România - Republica Moldova) şi a urmărit cunoaşterea faunei de nevertebrate din două culturi agricole: rapiţă (*Brassica napus* L.) şi lucernă (*Medicago sativa* L.), amplasate în localitatea Singureni (jud. Giurgiu). A fost analizată structura comunităţilor de nevertebrate din punct de vedere al compoziţiei specific şi abundenţei numerice. Au fost identificate 15 specii de colembole, aparţinând la şapte familii, şi 38 specii de coleoptere, care fac parte din 17 familii. *Entomobrya handschini*, *Lepidocyrtus paradoxus, Isotoma anglicana* au fost abundente în cultura de lucernă, iar *Hemisotoma thermophyla*, *Protaphorura sakatoi, Orchesella flavescens* (Collembola) au fost abundente în cultura de rapiţă. Din cadrul ordinului Coleoptera, *Dermestes murinus, Brachinus crepitans* şi *Epicometis hirta* au fost dominante în cultura de rapiţă. *Coccinella septempunctata* şi *Gonioctena fornicata* au fost dominante în cultura de lucernă. De asemenea, au fost colectate, cu ajutorul fileului entomologic, 385 exemplare de nevertebrate din diferite grupuri taxonomice (Heteroptera, Homoptera, Diptera, Hymenoptera, Thysanoptera, Orthoptera şi Araneae). S-au evidenţiat speciile de nevertebrate dăunătoare şi cele prădătoare, care sunt folositoare culturilor agricole.

Cuvinte cheie: lucernă; rapiţă; abundenţă numeric; nevertebrate.

EVALUATION OF YIELD AND YIELD COMPONENTS CHICKPEA (*CICER ARIETINUM* L.) IN INTERCROPPING WITH SPRING BARLEY (*HORDEUM VULGARE* L.)

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ABSTRACT. Intercropping is considered for increasing and stability of yield per average unit. In order to evaluate the effect of barley/chickpea intercrop, a study was carried out in the research field of Faculty of Agriculture, Maragheh University, in 2009 as randomized compelet block design, with three replicates, with row replacement series. Treatments included different combinations (1:1,2:1, 3:1, 2:2 and 3:2 row ratios of barley:chickpea) and their monocultures. Results indicated that the highest yield was obtained from combination of one row barley and one row Desi chickpea.The highest number of pods was obtained, also, in combination of one row barley and one row Desi chickpea. There was a significant difference among treatments including Desi chickpea and Kabuli chickpea 100-grain weight that its Kabuli chickpea was more. The correlation coefficient analysis indicated that number of pods per plot had the highest positive relationship and protein percentage had the highest negative relationship with yield per plot. The path coefficient analysis showed that the number of pods had the highest direct effect on yield percentage via the number of pods.

Key words: Intercrop combination; Barley/Chickpea intercrop; Correlation coefficient; Path analysis.

STRUCTURE, DYNAMICS AND ABUNDANCE OF COLEOPTERA SPECIES IN SWEET AND SOUR CHERRY PLANTATIONS FROM IAŞI AND VASLUI COUNTIES, ROMANIA

Nela TĂLMACIU, M. TĂLMACIU, Monica HEREA

ABSTRACT. The paper brings contributions to the knowledge of fauna of beetles (Coleoptera) in some ecosystems of sweet and sour cherry from Iaşi and Vaslui counties, Romania. For catching insects from orchards two methods have been used: the sampling with the Barber soil traps method, six traps placed in each experimental group, which were fixed with a salt solution (NaCl) 5%, and the beating method, where insects collected were kept and preserved in alcohol 90°, and after them, the insects collected were pooled and brought to the laboratory, where they were prepared for determination. During the vegetation, at Barber soil traps the insects have been collected in sweet and sour cherry plantations, where various control methods have been applied. From the collected material, Coleoptera species were selected, and were determined by species. Among the most common Coleoptera have identified: *Stethourus punctilum* Weisse, *Carabus violaceus* L.; *Silpha obscura* L., *Cymindis humeralis* Fourc., *Apion atomarium* Kirby, *Otiorrynchus ovatus* L., *Dermestes laniarius* Illig., *Harpalus calceatus* Duft.

Key words: Predators; Poluation; Treatments; Pests.

REZUMAT. Structura, dinamica şi numărul speciilor de Coleoptera din plantaţiile de cireş şi vişin din judeţele Iaşi şi Vaslui. Lucrarea aduce contribuţii la cunoaşterea faunei de coleoptere (ordinul Coleoptera) din unele ecosisteme de cireş şi vişin din judeţele Iaşi şi Vaslui, România. Pentru colectarea insectelor din livezi s-au ales doua metode: colectarea cu ajutorul metodei capcanelor de sol tip Barber, amplasate câte şase în fiecare lot experimental, care au ca soluţie fixatoare o soluţie de sare (NaCl) 5%, şi metoda frapajului, unde insectele colectate au fost păstrate şi conservate în alcool 90°, iar în uma acestora, insectele colectate au fost centralizate şi aduse în laborator, unde au fost pregătite pentru determinare. În timpul perioadei de vegetaţie, la capcanele de tip Barber, au fost colectate insecte din plantaţiile de cireş şi vişin, în care au fost aplicate diverse metode de control; dintre cele mai utilizate amintim: metode biologice de combatere şi metoda chimică de combatere. Din materialul colectat au fost selectate speciile de Coleoptera şi au fost determinate pe specii. Dintre cele mai comune coleoptere s-au identificat: *Stethourus punctilum* Weisse, *Carabus violaceus* L.; *Silpha obscura* L., *Cymindis humeralis* Fourc, *Apion atomarium* Kirby, *Otiorrynchus ovatus* L., *Dermestes laniarius* Illig., *Harpalus calceatus* Duft.

Cuvinte cheie: prădători; poluare; tratamente; dăunători.