

IMPACT OF LIVESTOCK MANURE, NITROGEN AND BIOFERTILIZER (*AZOTOBACTER*) ON YIELD AND YIELD COMPONENTS OF WHEAT (*TRITICUM AESTIVUM* L.)

A. ESMAILPOUR, M. HASSANZADEHDELOUEI, A. MADANI

ABSTRACT. Integrated nutrient management strategies involving chemical and biologic fertilizer is a real challenge to stop using the high rates of agrochemicals and to enhance sustainability of crop production. In order to study the effects of livestock manure, chemical nitrogen, and biologic (*Azotobacter*) fertilizers on yield and yield components of wheat, an agricultural experiment in the form of split factorial design with three replications was conducted in Elam region, Iran. The aim of this research was assessment of the effects of these fertilizers separately and in integrated forms; and setting out the best fertilizer mixture. The results showed that treatment with livestock manure, *Azotobacter* and chemical nitrogen increased plant height, biological and grain yield. Using livestock manure and *Azotobacter* increased biologic yield through increase in plant height which cause to increase in grain yield without any significant changes in harvest index and other yield components, but the use of chemical nitrogen caused an increase in plant height, No. of spikelete/spike, No. of grain/spike, one thousand grain weight and harvest index, biologic and grain yield. In the light of the results achieved, we may conclude that using livestock manure and chemical nitrogen fertilizer together with the *Azotobacter* had the maximum impact on yield; and that we can decrease use of chemical fertilizers through using livestock manure and biologic fertilizers and to reach to the same yield when we use only chemical fertilizers.

Key words: Wheat; Livestock manure; *Azotobacter*; Nitrogen fertilizer.

EFFECT OF TILLAGE AND ORGANIC MULCHES ON GROWTH, YIELD AND QUALITY OF AUTUMN PLANTED MAIZE (*ZEA MAYS* L.) AND SOIL PHYSICAL PROPERTIES

M.S.I. ZAMIR, H.M.R. JAVEED, W. AHMED, A.U.H. AHMED,
N. SARWAR, M. SHEHZAD, M.A. SARWAR, S. IQBAL

ABSTRACT. The research work was conducted to see the effect of organic mulches and tillage practices on growth, yield and quality of autumn planted maize and soil physical properties. Four types of tillage practices i.e. conventional tillage, zero tillage, bar harrow tillage, subsoiler tillage and two types of mulching material i.e. wheat straw mulch and saw dust mulch was used. The mulching material was partially incorporated in the field after germination of crop. The experiment was carried out in randomized complete block design (RCBD) with three replications. Control treatment was kept for comparison. All other practices were kept uniform throughout the crop period. Data about growth and yield components were collected and analyzed statistically by fisher analysis of variance and treatment significance was measured by significant difference test at 5v% level. The results showed that zero tillage + wheat straw mulch gave maximum 1000-grain weight (341.67 g) and grain yield (6.33 t ha⁻¹) and it was followed by conventional tillage + saw dust mulch (4.92 t ha⁻¹). Higher protein content was recorded in Subsoiler tillage (10.26 %). Conducive soil physical conditions were observed in the zero tillage practices over the other tillage practices. On the basis of these results it could be proposed that the tillage and mulching is a very important practice to

increase the yield of crop. Among different practices, zero tillage with wheat straw mulching gave maximum yield and net benefits.

Key words: Tillage; Mulch; Yield; Soil physical properties; Maize.

CRITICAL SEASON FOR SOIL EROSION IN THE MOLDAVIAN PLATEAU

C. AILINCĂI, G. JITĂREANU, D. BUCUR, Despina AILINCĂI

ABSTRACT. Experiments conducted at Agricultural Research and Development Station of Podu-Iloaiei, Iași County, Romania, during 2002 - 2011, followed study runoff and soil erosion in different cultures, and establish critical season of soil erosion in this area. Establish critical season of soil erosion is necessary to satisfy the critical level of ground cover, which is required to maintain a low risk of soil erosion. Average annual soil loss by erosion, recorded in maize and sunflower were (mean on 10 years) of 6.753 and 7.385 t/ha/year, respectively. In sunflower and corn of the total soil loss recorded in the Moldavian Plateau, 19.7- 20.4% occurred in spring, 68.7 to 69.2% in summer and 6.1- 6.6% in the autumn. Differences of 4.5 to 4.9% of the total annual soil losses by erosion were recorded in winter, with snow melt. Season critic of soil erosion in the Moldavian Plateau, when recording the most aggressive rain event occurs in June and July. Mean soil loss due to erosion, recorded in June and July were 0.424 t/ha for winter rape, winter wheat 0.291 and 0.093 t/ha the perennial grasses in the second year of vegetation.

Key words: Slope land; Cropping systems; Water erosion; Critical season of soil erosion.

REZUMAT. Sezonul critic pentru eroziunea solului în Podișul Moldovei. Experiențele realizate la Stațiunea de Cercetare-Dezvoltare Agricolă Podu-Iloaiei, județul Iași, în perioada 2002-2011, au urmărit studiul scurgerilor de apă și de sol prin eroziune la diferite culturi și stabilirea sezonului critic de eroziune a solului în aceasta zonă. Stabilirea sezonului critic de eroziune a solului este necesară pentru a satisface nivelul critic de acoperire a solului, în vederea menținerii unui risc redus de eroziune a acestuia. Pierderile medii anuale de sol prin eroziune, înregistrate la porumb și floarea-soarelui, au fost (media pe 10 de ani) de 6.753 și, respectiv, 7.385 t/ha/an. La floarea-soarelui și porumb, din totalul pierderilor de sol înregistrat în Podișul Moldovei, 19,7-20,4% au avut loc în primăvară, 68,7- 69,2% în lunile de vară și 6,1- 6,6% în lunile de toamnă. Diferențele de 4,5 până la 4,9%, din totalul pierderilor anuale de sol prin eroziune, au fost înregistrate în timpul iernii, odată cu topirea zăpezii. Sezonul critic de eroziune a solului în Podișul Moldovei, când se înregistrează cele mai agresive evenimente pluviale, are loc în lunile iunie și iulie. Valoarea medie a pierderilor de sol prin eroziune, înregistrate în lunile iunie și iulie, au fost de 0.424 t/ha la rapița de toamnă, 0.291 t/ha la grâul de toamnă și 0.093 t/ha la ierburile perene, în anul doi de vegetație.

Cuvinte cheie: teren în pantă; sisteme de cultură; eroziunea produsă de apă; sezonul critic de eroziune.

IMPACT OF VARYING PLANTING PATTERNS AND FERTILIZER APPLICATION STRATEGIES ON AUTUMN PLANTED SUNFLOWER HYBRID

M. YASIN, A. MAHMOOD, A. ALI, M. AZIZ, M.M. JAVAID,
Z. IQBAL, A. TANVEER

ABSTRACT. Achene yield, oil contents and protein contents are vital yield attributes of sunflower crop. To acquaint the impact of NP rates and planting patterns on the production potential of autumn sunflower hybrid Hysun-33 and fertilizer use efficiency a field experiment was executed in 2005. Treatments comprised of four NP combinations viz. 0-0, 50-35, 100-70 and 150-105 NP kg ha⁻¹ and two planting patterns viz. bed sowing with 75 cm wide beds separated by 20 cm furrows and bed sowing with 60 cm wide beds separated by 25 cm furrows. Treatment 150-105 NP kg ha⁻¹ with 75 cm wide beds separated by 20 cm furrows was found to be supercilious as it exhibited significant lofty achene yield (3360.00 kg ha⁻¹), number of achene head⁻¹ (1267.02), 1000-achene weight (68.65 g), biological yield (11166.6 kg ha⁻¹) and harvest index (30.09%). Contrastingly, treatment 0-0 N-P kg ha⁻¹ with 60 cm wide bed separated by 25 cm plant spacing bestowed the minimum grain yield. Frail increase in oil contents with gradual increase in fertilizer levels but it did not procure at a level of significance. Superior protein contents (27.71%) were revealed in treatment 150-105 N-P kg ha⁻¹ with 75 cm wide bed separated by 20 cm plant spacing.

Key words: Achene yield; Biological yield; Oil contents; Plant spacing; Protein contents.

POLLINATOR FAUNA OF SESAME CROP (*SESAMUM INDICUM* L.) IN ISMAILIA GOVERNORATE, EGYPT

S.M. KAMEL, A.E.H. BLAL, H.M. MAHFOUZ, M. SAID

ABSTRACT. A survey of insect pollinators associated with sesame, *Sesamum indicum* L. (*Pedaliaceae*), was conducted at the Agriculture Research Farm, Faculty of Agriculture, University of Suez Canal during the growing seasons of 2011 and 2012. All different insect pollinators which found on the experimental site were collected for identification. Sampling was done once a week and three times a day. Three methods were used to collect and identify insects from the sesame plants (a sweep net, pitfall traps, digital camera and eye observation). A total of 29 insect species were collected and properly identified during the survey. Insect pollinators which recorded on the plants were divided into four groups, 18 belonged to *Hymenoptera*, seven to *Diptera*, three to *Lepidoptera* and one to *Coleoptera*. Results revealed that honey-bee, *Apis mellifera*, was the most dominant species in the 2011 season and the second one in the 2012 season. Whereas small carpenter bees, *Ceratina tarsata* was the most dominant species in the 2012 season and the second one in the 2011 season. The percentage of *Hymenoptera* was higher in the two studied seasons by 90.94% and 89.59%, followed by *Diptera* by 3.93% and 5.38%, then *Lepidoptera* by 3.58% and 3.62, and in the last *Coleoptera* by 1.53% and 1.39%, respectively.

Key words: Sesame; Insect pollinators; Relative abundance; Population dynamics.

**RESEARCH ON THE FLIGHT EVOLUTION OF *MELOLONTHA*
MELOLONTHA L. (*COLEOPTERA*, *SCARABAEIDAE*) SPECIES IN THE
CENTRAL OF MOLDAVIA CONDITIONS, ROMANIA**

Elena TROTUȘ, Margareta NAIE, Alexandra-Andreea BUBURUZ

ABSTRACT. The cockchafer (*Melolontha melolontha* L.) is the most widespread and best known bug. It is a polyphagous bug, being harmful both in adulthood and in larva stage. The researches were conducted at Agricultural Research and Development Station (A.R.D.S.) of Secuieni, Neamț county, Romania, and followed the evolution of adult flight, during 1993 – 2012 with a light trap help. The gatherings and records were made daily from 1 April to 31 October every year, during the observation period. Dividing the observation period into four stages of five years each, it was found that the largest number of specimens, 38059, was collected in the second stage (1998 – 2002), followed by the third stage (2003 – 2007) with 18167 specimens, first stage with 12173 specimens, and the lowest number of 286 specimens was recorded in the fourth stage (2008 – 2012). The adults flight started in all the years in the second or the third decade of April and lasted until the second or the third decade of May, with the exception of 1995 și 2009 when he finished in the first decade of June. The average duration of the flight was 39 days. The maximum flight curve was reached, in all years of observation, in the third decade of April and first decade of May. The maximum intensity of flight curves was recorded every three years, as follows: 1994, 1997, 2000, 2003, 2006, 2009, 2012. This shows that, in Secuieni conditions, the insect has one generation at 3 years. Highest intensity of flights has been in the years 2000, when the top flight was conducted by 38059 specimens, 2003 with 13912 specimens/flight and 1997 with 10221 specimens/flight.

Key words: Beetle; Flight; Years; Specimens.

REZUMAT. Cercetări privind evoluția zborului speciei *Melolontha Melolontha* L. (*Coleoptera*, *Scarabaeidae*) în condițiile din centrul Moldovei. Cărbușul de mai (*Melolontha melolontha* L.) este cel mai răspândit și mai cunoscut gândac. Este o specie polifagă, fiind dăunătoare atât în stadiul de adult, cât și în cel de larvă. Cercetările s-au efectuat la S.C.D.A. Secuieni – Neamț și au urmărit evoluția zborului adulților în perioada anilor 1993 – 2012, cu ajutorul unei capcane luminoase. Colectările și înregistrările s-au efectuat zilnic, începând cu 1 aprilie și până la 31 octombrie, în fiecare an pe parcursul perioadei de observație. Împărțind perioada de observație în patru etape a câte cinci ani fiecare, s-a constatat că cel mai mare număr de exemplare, de 38059, s-a colectat în etapa a doua (1998 – 2002), urmat de etapa a treia (2003 – 2007) cu 18167 exemplare, etapa întâia cu 12173 exemplare, iar cel mai redus număr, de 286 exemplare, s-a înregistrat în etapa a patra (2008 – 2012). Zborul adulților a început, în toți anii, în decada a doua sau a treia a lunii aprilie și a durat până în decada a doua sau a treia a lunii mai, cu excepția anilor 1995 și 2009, când s-a încheiat în prima decadă a lunii iunie. Durata medie a zborului a fost de 39 de zile. Curba maximă de zbor s-a atins, în toți anii de observație, în decada a treia a lunii aprilie și în prima decadă a lunii mai. Intensitatea maximă a zborului de zbor s-a înregistrat din trei în trei ani, după cum urmează: 1994, 1997, 2000, 2003, 2006, 2009, 2012. Aceasta demonstrează că, în condițiile de la Secuieni, insecta prezintă o generație la 3 ani. Intensitatea cea mai ridicată a zborurilor s-a înregistrat în anii 2000, când vârful de zbor a fost realizat de 38059 exemplare, 2003 cu 13912 exemplare/zbor și 1997 cu 10221 exemplare/zbor.

Cuvinte cheie: gândac; zbor; ani; exemplare.

THE EFFECT OF NaCl PRIMING ON EMERGENCE, GROWTH AND YIELD OF FENUGREEK UNDER SALINE CONDITIONS

M. SOUGHIR, M.A. ELOUAER, C. HANNACHI

ABSTRACT. Salinity is considered as a major abiotic stress affecting crop production in arid and semi-arid regions in the world. Poor germination and decrease of seedling growth are major results of poor crop establishment and failure. Many research studies have shown that seed priming is an efficient method for increasing plant growth and yield in saline condition. For this reason, this experiment was conducted to evaluate the effects of NaCl priming on the emergence and seedling growth of Tunisian fenugreek (*Trigonella foenum-graecum* L.) under salinity conditions. Seeds of fenugreek were primed with NaCl (4 g L⁻¹) for 36 h in continuous 25°C. Primed (P) and non-primed (NP) seeds were sown in plastic pots and placed in greenhouse for 4 months. Experiments were conducted using various NaCl concentrations (0, 4, 6, 8 and 10 g L⁻¹). Results showed that emergence percentage of primed seeds was greater than non-primed seeds. Roots length, plant height, leaf area, fresh and dry weight and yields of plants derived from primed seeds were higher compared with non-primed seeds. Na⁺ content of plants derived from primed seeds was lower than that of primed ones. In the other side, K⁺ and Ca²⁺ content of plants derived from primed seeds was higher compared with plants derived from non-primed seeds. These results suggest that NaCl priming of fenugreek seeds increased salt tolerance of seedlings by reducing Na⁺ and promoting K⁺ and Ca²⁺ accumulation.

Key words: Emergence; Fenugreek; Growth; NaCl priming; Salt Tolerance; Yield.

DEMOGRAPHIC STUDY ON THE TOTAL SURA DE STEPĂ BREED POPULATION IN ROMANIA

Șt. CREANGĂ, D.L. DASCĂLU, Elena RUGINOSU, I. BORSȚ,
Daniela Elena ILIE, Ada CEAN²

ABSTRACT. The research was conducted from August until November 2012 in the districts of Moldavia (Botoșani, Suceava, Iași, Vaslui, Bacău, Neamț, Galați and Vrancea), in the West and the Central part of the country (Cluj and Covasna districts) and in the South-East of the country (Tulcea and Brăila districts). The choice of the districts was established based on the informations received from Animal Improvement and Breeding Offices in Romania. The purpose of this research was to identify the effective of Sura de stepă cattle breed in Romania and the evaluation of the phenotypic characters in steppe animals, which belong to the variety of Moldavian breed. The results showed that the Sura de stepă breed consists of a minor part, being raised in just two districts of Moldavia, Iași and Neamț, respectively, as a pure breed with an average of 0,03 % (83 cows), at the Research and Development Station for Cattle Breeding (R.D.S.C.B.) Dancu-Iași, with a core of preservation of 59 cows (0,19 %) and at the Holding TCE 3 Brazi Society, Neamț district, with a core of 24 cows (0,06 %), and under half-breed form with an average of 0,33 % (592 cows). In Harghita, Covasna and Cluj districts, 295 cows from the Sura de stepă breed, Hungarian variety, were identified, excepting being the animals belonging to University of Agricultural Sciences and Veterinary Medicine Cluj, which come from R.D.S.C.B. Dancu-Iași, which are Romanian Sura de stepă, Moldavian variety. In Tulcea district, 20 cows of half-breed Sura de stepă and 50 cows of pure breed cattle, Moldavian variety, were identified, from which 24 cows at a private landlord in Pardina locality, Tulcea district, and 26 cows belonging to nine owners from different localities (C.A.

Rosetti, Pardina, Chilia Veche, Sfântu Gheorghe, Crișan), each owning 2-3 cows. The analysis of the main body indices showed that the Sura de stepă cows from Pardina, Tulcea county, are of small size and weight, having smaller values in all analysed parameters, compared to the Sura de stepă cows from R.D.S.C.B. Dancu-Iași from the North-East part of the country, which however fitted the specific limits of the breed, Moldavian variety.

Key words: Cattle; Sura de stepă cattle breed; Inventory; Geographical spreading.

REZUMAT. Studiu demografic asupra populației totale din rasa Sura de stepă din România. Studiul a fost efectuat în perioada august-noiembrie 2012 în județele din Moldova (Botoșani, Suceava, Iași, Vaslui, Bacău, Neamț, Galați, și Vrancea), în vestul și centrul țării (Cluj, Covasna) și în sud-estul țării (Tulcea și Brăila). Alegerea județelor s-a făcut pe baza informațiilor primite de la Oficiile de Ameliorare și Reproducție în Zootehnie. Scopul acestei lucrări a fost de a identifica efectivele de vaci din rasa Sura de stepă din Romania și de a evalua caracterele fenotipice de rasă la animalele care aparțin varietății moldovenești a rasei. Rezultatele au evidențiat că rasa Sura de stepă are o pondere foarte mică, fiind crescută doar în două județe din Moldova, respectiv Iași și Neamț, ca rasă curată, în medie 0,03 % (83 capete), la Stațiunea de Cercetare-Dezvoltare pentru Creșterea Bovinelor (S.C.D.C.B.) Dancu-Iași, cu un nucleu în conservare de 59 capete (0,19%) și la S.C. Holding TCE 3 Brazi S.R.L., Neamț county, cu un nucleu de 24 capete (0,06%), iar sub formă de metiși, în medie 0,33 % (592 capete). În județele Harghita, Covasna și Cluj au fost identificate un număr de 295 animale din rasa Sura de stepă, varietatea maghiară, cu excepția animalelor care aparțin U.Ș.A.M.V. Cluj, provenite de la S.C.D.C.B. Dancu-Iași, care sunt Sura de stepă românească, varietatea moldovenească. În județul Tulcea a fost identificat un număr total de 2011 capete metiși din rasa Sura de stepă, 50 capete taurine de rasă curată, varietatea moldovenească, din care 24 capete la un proprietar particular în localitatea Pardina, județul Tulcea, iar 26 de capete au fost identificate la nouă proprietari din diverse localități (C.A. Rosetti, Pardina, Chilia Veche, Sfântu Gheorghe, Crișan), câte 2-3 capete/gospodărie. Analiza principalilor indici corporali a evidențiat faptul că vacile din rasa Sura de stepă de la Pardina, județul Tulcea, sunt de talie și greutate mai mici, cu valori medii mai mici la toți parametri analizați, comparativ cu vacile Sura de stepă de la S.C.D.C.B. Dancu-Iași, din zona de nord-est a țării, dar care s-au încadrat în limitele specifice rasei, varietatea moldovenească.

Cuvinte cheie: taurine; rasa Sura de stepă; inventariere; raspândire geografică.

DROUGHT STRESS, ITS EFFECT ON MAIZE PRODUCTION AND DEVELOPMENT OF DROUGHT TOLERANCE THROUGH POTASSIUM APPLICATION

**M. ASLAM, M.S.I. ZAMIR, I. AFZAL, M. YASEEN, M. MUBEEN,
A. SHOAB**

ABSTRACT. Today, the world is facing many problems for crop production among them drought is the most dangerous. Here in this paper we have reviewed the threat of drought to food security in future especially related to maize production. Water is a cooling agent plays an important role in the functioning of plant body. Drought stress have deleterious effects on the seedling establishment, vegetative growth, photosynthesis, root growth, anthesis, anthesis-silking interval, pollination and grain formation in maize crop. The deleterious effects of drought can be mediated by application of nutrients which may enhance tolerance to drought

stress. Among the nutrients potassium can enhance the tolerance in maize plant for drought stress. The application of potassium enhanced root growth and stem elongation. Similarly, potassium increased leaf water potential, osmotic potential and turgor potential under drought stress. Likewise, gas exchange parameters are improved by potassium. Application of potassium enhanced the photosynthetic rate and has better effect on other attributes. Most importantly potassium is greatly helpful in transport of sugars prepared in leaves to fruit. Potassium enhanced the yield and yield related parameters of maize crop. It seems quite important to study the role of potassium for increasing the plant tolerance to drought stress and to increase yield of crop under drought stress.

Key words: Drought stress; Maize; Growth; Drought tolerance; Potassium.