

MODELING DRYING CHARACTERISTICS OF TEREBINTH FRUIT UNDER INFRARED FLUIDIZED BED CONDITION

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ABSTRACT. Advantages of infrared fluid bed drying include high heat and mass transfer coefficients, short process time, high quality and low energy consumption. Since heat and mass transfer and quality changes during drying of terebinth fruit with infrared fluid bed method is not described in the literature. Goals of this research were study the effects of different infrared drying conditions on the drying kinetic and physical parameters of terebinth fruit. To predict moisture during drying process, five mathematical models were used. Experiments were conducted at different levels of hot air velocity (0.93, 1.76 and 2.6 m/s), temperature (40, 55, and 70°C) and infrared radiation power (500, 1000 and 1500 W). Results showed that Demir *et al.* model had the best performance for predicting of moisture ratio. Effective moisture diffusivity for terebinth samples (6.2×10^{-11} to 7.3×10^{-10} m²/s) was achieved. Activation energy of the samples (44.4 to 59.13 kJ/mol) was computed. Maximum rupture force (118.4 N) was calculated at air velocity of 2.6 m/s, infrared power of 1500 W and air temperature of 70°C. The results proved that in addition to short process time, monitoring of terebinth fruit characteristics such as mechanical properties during drying process can be achieved.

Key words: Terebinth; Drying; Thin layer; Activation energy; Rupture force.

EVALUATION AND MODELING SOME ENGINEERING PROPERTIES OF THREE SAFFLOWER VARIETIES

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ABSTRACT. Several physical properties of three safflower cultivars (IL-111, LRV51-51 and Zarghan279) at moisture contents of 10, 15, 20 and 25% were determined and compared. All the linear dimensions, geometric mean diameter and sphericity of safflower seeds increase linearly with increase in seed moisture content. The values of geometric properties were higher for IL-111 cultivar than the LRV51-51 and Zarghan279 cultivars. The values of the bulk densities decreased, whereas the thousand seeds mass, true density and porosity were increased with increase in seed moisture content. All the gravimetric properties for the three cultivars of safflower were significantly different ($p < 0.05$). The values of the terminal velocity for all cultivars were significantly increased as the moisture content increased. The terminal velocity for the three cultivars of safflower were significantly different ($p < 0.05$). On the two different surfaces, the coefficient of static friction of the IL-111 cultivar was significantly greater than that of the other cultivars. The static coefficient of friction was higher on plywood and lower for galvanized steel. The values of the angle of repose increased with increase of the moisture content. The values of the angle of repose for Zarghan279 cultivar were higher than the IL-111, LRV51-51 cultivars.

Key words: Safflower; Physical properties; Sphericity; Surface area; Porosity; True and bulk density; Terminal velocity; Static coefficient of friction.

THE EFFECT OF HYDRO-PRIMING ON GERMINATION CHARACTERISTICS, SEEDLING GROWTH AND ANTIOXIDANT ACTIVITY OF ACCELERATED AGING WHEAT SEEDS

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ABSTRACT. Seed aging is an important problem in developing countries which seeds stored in inappropriate condition. Delayed germination, reduced normal seedling percentage and changed antioxidant enzymes activity are some indications of aged seeds. Priming is a technique applied before planting and can improve seed characteristics especially under abiotic stress conditions. The main objective of the study was to evaluate aging effect on seed quality and to study the interaction between seed aging and seed priming. A factorial experiment based on completely randomized design with three replicates was conducted. The experimental treatments included cultivar, priming and aging. Results showed that seed aging reduced germination percentage, germination index, seedling length, normal seedling percentage, seedling dry weight, catalase and ascorbate peroxidase activity and increased the germination mean time and electrical conductivity of seeds. The highest germination percentage, germination index, seedling length, normal seedling percentage, seedling dry weight, catalase and ascorbate peroxidase activity and the minimum germination mean time and electrical conductivity of seeds were attained from hydro-priming treatment under non aged condition. Hydro-priming improved aged seeds quality and increased enzymes activity. Therefore, priming is a technique can be applied to improve aged seeds germination and seedling characteristics.

Key words: Wheat; Accelerated aging; Hydro-priming; Germination; Catalase; Ascorbate peroxidase.

EVALUATION OF SPRING WHEAT GENOTYPES (*TRITICUM AESTIVUM* L.) FOR HEAT STRESS TOLERANCE USING DIFFERENT STRESS TOLERANCE INDICES

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ABSTRACT. Twenty five spring wheat genotypes were evaluated for terminal heat stress tolerance in field environments in the Agro Ecological Zone-11 of Bangladesh, during 2009-2010 cropping season. The experiments were conducted at Wheat Research Centre, Bangladesh Agricultural Research Institute, using randomized block design with three replicates under non-stress (optimum sowing) and stress (late sowing) conditions. Seven selection indices for stress tolerance including mean productivity (MP), geometric mean productivity (GMP), tolerance (TOL), yield index (YI), yield stability index (YSI), stress tolerance index (STI) and stress susceptibility index (SSI) were calculated based on grain yield of wheat under optimum and late sowing conditions. The results revealed significant variations due to genotypes for all characters in two sowing conditions. Principal component analysis revealed that the first PCA explained 0.64 of the variation with MP, GMP, YI and STI. Using MP, GMP, YI and STI, the genotypes G-05 and G-22 were found to be the best genotypes with relatively high yield and suitable for both optimum and late heat stressed conditions. The indices SSI, YSI and TOL could be useful parameters in discriminating the tolerant genotypes (G-12, G-13, and G-14) that might be recommended for heat stressed conditions. It is also

concluded from the present studies that biomass, grain filling rate and spikes number m^{-2} are suitable for selecting the best genotypes under optimum and late sowing conditions because these parameters are highly correlated with MP, GMP, YI and STI. However, high ground cover with long pre heading stage and having high grain filling rate would made a genotype tolerant to late heat to attain a high grain yield in wheat.

Key words: Heat stress; Stress tolerance indices; Principal component analysis; Biplot.

IMPACT OF ZINC AND MANGANESE APPLICATION TO INCREASE PRODUCTIVITY OF AUTUMN PLANTED MAIZE (*ZEA MAYS* L.)

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ABSTRACT. Micronutrients play a significant role in various plant metabolic processes and are required in much smaller amount by the plants as compared to the macronutrients. An experiment was conducted during 2011, at the Agronomic research area, University of Agriculture, Faisalabad, Pakistan, to investigate the response of autumn planted maize to $ZnSO_4$ and $MnSO_4$ levels (10, 20 and 30 $kg\ ha^{-1}$) and in combinations (5 $kg\ ha^{-1}\ ZnSO_4 + 5\ kg\ ha^{-1}\ MnSO_4$, 10 $kg\ ha^{-1}\ ZnSO_4 + 10\ kg\ ha^{-1}\ MnSO_4$ and 15 $kg\ ha^{-1}\ ZnSO_4 + 15\ kg\ ha^{-1}\ MnSO_4$). The randomized complete block design (RCBD) having three replicates was used with plot size of 3 m x 6 m. The crop was planted on ridges 75 cm apart with recommended plant to plant distance of 25 cm. Maximum values for plant height at maturity (225 cm), cob diameter (4.29 cm), number of grains per cob (415), biological yield (20.15 tons ha^{-1}), grain yield (7.42 tons ha^{-1}) and seed protein content (8.96%) were recorded where 15 $kg\ ha^{-1}\ ZnSO_4 + 15\ kg\ ha^{-1}\ MnSO_4$ was applied.

Key words: Maize; Zn; Mn.

EARLY SOWING REDUCES COTTON LEAF CURL VIRUS OCCURRENCE AND IMPROVES COTTON PRODUCTIVITY

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ABSTRACT. Cotton productivity is severely hampering by various diseases and insect pests especially cotton leaf curl virus (CLCV) worldwide. Losses caused by CLCV are far more than any other factor affecting cotton productivity. Growing of early and resistant genotypes is of vital significance in alleviating the adversities of these pests in crop plants. The current field trial was conducted at Central Cotton Research Institute (CCRI) Multan, Pakistan, to investigate the role of varying sowing dates in managing the CLCV infestation on different elite cotton genotypes. The crop was sown on five different dates i.e. $D_1 = 15^{th}$ April, $D_2 = 1^{st}$ May, $D_3 = 15^{th}$ May, $D_4 = 1^{st}$ June and $D_5 = 15^{th}$ June and three different elite cotton genotypes, i.e. $V_1 = CIM-612$, $V_2 = CIM-591$ and $V_3 = CIM-573$ to optimize a suitable sowing date and to screen out high productive and tolerant genotype against the CLCV. Seeds were drilled manually on finely crafted seedbed by using single row hand drill keeping seeding density of 20 $kg\ ha^{-1}$ and inter row spacing of 75cm. CLCV severely hampered the crop performance by

delayed planting of cotton from 15th April; while increased the chances of disease incidence. It is concluded that early sowing of all tested genotypes especially CIM-592 reduces the problem of CLCV and enhanced cotton productivity.

Key words: Cotton; Leaf Curl Virus; Sowing dates; Seed cotton yield.

INVESTIGATIONS ON DETERMINATION OF NUTRITIONAL STATUS OF PEAR TREES ACCORDING TO A NEW INDEX - DEVIATION FROM OPTIMUM PERCENTAGE (DOP)

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ABSTRACT. This experiment was conducted in a private orchard (Kosar) in district of Shahriar of Alborz province (Iran), during 2012-2013, to determine the effects of B and Zn applied on flowers at full bloom stage on leaf macro and micronutrient contents at 90 days after full bloom (DAFB) of three pear cultivars (Spadona and Duchesse and a pear cultivar from Iranian national collection, named as Daregazi). The deviation from the optimum percentage (DOP) index of macro and micronutrients for two studied years was used to evaluate the nutritional status: optimal (DOP = 0), deficiency (DOP < 0) or excess (DOP > 0). The Σ DOP for two studied years is obtained by adding the values of DOP index irrespective of sign. The larger the Σ DOP, the greater is the intensity of imbalances among nutrients. In general, a DOP value close to the optimum level (DOP = 0) were observed in treated studied pear cultivars with B and Zn applied on flowers at full bloom stage compared with the control trees (without any application of boron and zinc). The DOP_{macro} and DOP_{micro} were, respectively, positive and negative for all of studied pear cultivars regardless of treatments. According to Σ DOP index (during 2012-2013), the combination of both products (borax+zinc sulfate treatments) at full bloom stage applied on flowers of three pear cultivars (Spadona, Duchesse and Daregazi) showed better balanced nutritional values than the rest of treatments.

Key words: DOP index; Pear cultivars; Nutritional status; Boron; Zinc.

CHARACTERISTICS OF THE BASELINE CLIMATE OF THE COTNARI (ROMANIA) WINE GROWING REGION

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ABSTRACT. The paper presents the baseline climate of the Cotnari wine growing region, the climate under whose influence were set up the wine grape varieties, wine types and grapevine training systems of this vineyard. It is also presented the baseline climate suitability for wine grape growing and its spatial variation in the vineyard area. The study is based on the climate data for the 1961 to 1980 time period, previous to the beginning of the climate warming and, therefore, considered to be representative for the baseline climate time period. According to study results, the baseline climate of the Cotnari wine growing region was cool, with annual average temperatures by 8.5...10.0°C, with a sum of the effective temperatures by 1081...1382°C, with freezing phenomena at the beginning and towards the end of the growing season, and with very cool nights during the month of September (CI+2). Elements that generate the baseline climate suitability for wine grape growing were: high average temperatures for the month of July (19...21.1°C); long growing season up to 190 days, and

high values for the global radiation, up to 93 kcal/cm²/April 1st - September 30th on the sunny slopes within the vineyard area. According to the multicriteria evaluation of the suitability for wine grape growing, 87.9% (1792 ha) of the vineyard surface was characterized by a baseline climate suitable for white quality wines and 11.9% (241.0 ha) by a baseline climate suitable for white table wines, sparkling wines and wines for distillates.

Key words: Cotnari wine growing region; Grapevine; Wine types; Climatic factors; Climate warming.

EFFECT OF SELENIUM SUPPLEMENTATION ON SERUM AMYLASE, LACTATE DEHYDROGENASE AND ALKALINE PHOSPHATASE ACTIVITIES IN RATS EXPOSED TO CADMIUM OR LEAD

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ABSTRACT. The purpose of the study was to assess the effect of selenium supplementation on serum amylase, lactate dehydrogenase (LDH) and alkaline phosphatase (ALP) activities in rats, during subacute exposure to toxic doses of cadmium or lead through the drinking water. The experimental groups (n=6) were: Control, Se (Se⁺⁴: 0,2 mg/l), Cd (Cd⁺²: 150 mg/l), Pb (Pb⁺²: 300 mg/l), Cd+Se (Cd⁺²: 150 mg/l; Se⁺⁴: 0,2 mg/l) and Pb+Se (Pb⁺²: 300 mg/l; Se⁺⁴: 0,2 mg/l). The animals were sacrificed after 56 days. Amylase, LDH and ALP activities were determined from serum. Se and Pb treatments caused an increase in amylase and LDH activities, when compared to Control group while Cd caused an increase in amylase activity and a decrease in LDH and ALP activities. Cd+Se caused a decrease in amylase activity and an increase in LDH activity, when compared to Cd. Pb+Se caused a decrease in amylase activity in comparison to lead. Selenium supplementation alleviated cadmium or lead induced changes in serum amylase activity. Selenium, coadministered with cadmium, caused a marked increase in serum LDH activity, when compared to cadmium alone or Control group while practically it had no effect on lead induced changes in LDH activity. Cadmium and lead induced disturbances in serum ALP activity were not influenced by selenium supplementation.

Key words: Rats; Lead; Cadmium; Selenium; Blood serum enzyme.

REZUMAT. Efectul suplimentării cu seleniu asupra activității amilazei serice, a lactat dehidrogenazei și a fosfatazei alcaline la șobolani, expuși la cadmiu sau plumb. Scopul acestui studiu a fost de a evalua efectul suplimentării cu seleniu asupra unor enzime, amilaza, lactat dehidrogenaza (LDH) și fosfataza alcalină (ALP) la șobolani, în timpul expunerii subacute la doze toxice de cadmiu sau plumb, prin intermediul apei de băut. Loturile experimentale (n=6) au fost: Martor, Se (Se⁺⁴: 0,2 mg/l), Cd (Cd⁺²: 150 mg/l), Pb (Pb⁺²: 300 mg/l), Cd+Se (Cd⁺²: 150 mg/l; Se⁺⁴: 0,2 mg/l) și Pb+Se (Pb⁺²: 300 mg/l; Se⁺⁴: 0,2 mg/l). Animalele au fost sacrificate după 56 de zile. Amilaza, LDH și ALP au fost determinate din ser. Administrarea de Se sau Pb a determinat o creștere a amilazei și LDH, în comparație cu lotul de control, în timp ce Cd a determinat o creștere a amilazei și o scădere a LDH și ALP. Cd+Se au cauzat o scădere a amilazei și o creștere a LDH, în comparație cu Cd. Pb+Se au produs o reducere a amilazei, în comparație cu plumbul. Suplimentarea cu seleniu a atenuat modificările induse de cadmiu sau plumb asupra amilazei serice. Seleniul, coadministrat cu cadmiul, a cauzat o creștere marcantă a activității serice a LDH, în comparație cu Cd sau lotul

martor, însă nu a avut nici un efect asupra modificărilor produse de plumb asupra activității LDH. Tulburările induse de cadmiu și plumb asupra activității serice a ALP nu au fost influențate de suplimentarea cu seleniu.

Cuvinte cheie: șobolani; plumb; cadmiu; seleniu; enzime serice.

STUDY ON PROMOTING COMPANIES SPECIALIZED IN THE PRODUCTION OF WINE FROM IAȘI COUNTY (ROMANIA) BY IMPLEMENTING ONLINE MARKETING (CASE STUDY)

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ABSTRACT. Online promotion of wine products is a new but indispensable approach in all promotional activities initiated by companies and producers of wine, whereas there is a need for a greater focus on this specific market, not separated from the real one, but a new component, increasingly prevalent. The new market, where demand is getting bigger in our country and where consumers are becoming more and more faithful to this type of promotion, is the online environment, which generated, as a response from manufacturers and distributors in almost all food industry areas, online marketing. Promoting in the virtual environment follows the same stages of development as any promoting strategy from other environments of intersection with customers: initial research, market segmentation, setting goals, market positioning, marketing mix, implementation of the promotional campaign itself and the implementation and post implementation control. The key features of wine products online promoting is interactivity and socialization. Internet communication occurs in two directions, unlike traditional marketing, which is unidirectional. The other characteristic of virtual promotional methods - socialization characterizes the future of cyberspace. The research purpose is not to separate the new form of promotion of other forms of nonvirtual marketing activities, but to emphasize that online marketing is the component that should not be missing from any promotional campaign launched by a company. The research was based on information provided by the S.C. Cotnari S.A. Department of Marketing. In order to determine the characteristics of online communication and modern promoting trends, we analyzed the website and social media accounts of this wine producer, as well as news portals and blogs. Questionnaires were applied on a sample of 133 consumers, to analyze the impact on their use of online marketing. The studied sample consisted of consumers of wine and, most of them, Internet users, from urban or rural areas. Each questionnaire contained 16 questions, with a total of 63 variables, and aimed to compare the behavior of respondents towards online promotion activity of S.C. Cotnari S.A., Iași county.

Key words: Online marketing; Promotion; Wine.

REZUMAT. Studiu privind promovarea firmelor specializate în producția de vin din județul Iași prin implementarea marketingului online (studiu de caz). Promovarea online a produselor vinicole este o abordare nouă, dar indispensabilă, în totalul activităților de promovare, demarate de companii și producătorii de vin, întrucât se resimte nevoia unei atenții sporite asupra acestei piețe specifice, nu separată de cea reală, ci o componentă nouă, din ce în ce mai predominantă. Noua piață, unde cererea devine din ce în ce mai mare și în țara noastră și unde consumatorii devin din ce în ce mai mulți și mai fideli acestui tip de promovare, este mediul online, ce a generat ca reacție din partea producătorilor și distribuitorilor din aproape toate domeniile agroalimentare marketingul virtual. Promovarea în mediul virtual urmărește aceleași etape ale elaborării unei strategii de promovare ca în oricare alt mediu de intersecție cu

clienții: cercetarea inițială, segmentarea pieței, stabilirea obiectivelor, poziționarea pe piață, mixul de marketing, implementarea campaniei de promovare propriu-zisă și controlul din timpul implementării și post implementare. Caracteristica esențială a promovării online a produselor viticole este interactivitatea și socializarea. Comunicarea prin Internet are loc în două direcții și nu este unidirecțională, ca în marketingul tradițional. De aici derivă o altă caracteristică a metodelor de promovare virtuale - socializarea, ce va caracteriza viitorul spațiului virtual. Scopul cercetării nu este acela de a separa noua formă de promovare de celelalte forme de marketing non-virtual, ci de a sublinia faptul că marketingul online este componenta ce nu ar trebui să lipsească din nicio campanie de promovare, lansată de o firmă agroalimentară. Cercetarea s-a realizat pe baza informațiilor oferite de Departamentul de marketing al S.C. Cotnari S.A. Pentru a determina caracteristicile comunicării online și ale tendințelor moderne de promovare utilizate au fost analizate website-ul și conturile de social-media ale producătorului de vinuri S.C. Cotnari S.A., precum și portaluri de știri și bloguri ale acestuia. Au fost aplicate chestionare pe un eșantion de 133 consumatori pentru analiza impactului utilizării marketingului online asupra acestora. Fiecare chestionar a cuprins 16 întrebări cu un număr de 63 variabile și are ca scop compararea și proiectarea perspectivei și a comportamentului respondenților asupra activității de promovare online a S.C. Cotnari S.A.

Cuvinte cheie: marketing online; promovare; vin.

DROUGHT TOLERANCE STUDIES IN WHEAT (*TRITICUM AESTIVUM* L.)

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ABSTRACT. Wheat is a foremost staple food crop of Pakistan and plays a vital role for stability of country's economy and people's food requirement. Shortage of water has remained a consistent problem for the farmers over past few years and different agronomic techniques have been introduced into the limelight. But there is an immense scope of making some genetic manipulations to improve/enhance the drought tolerance of wheat. It has been observed by many researchers that yield in drought stress conditions, is a fine fusion of the traits like days taken by crop to reach physical maturity, water use efficiency, crop water use and harvest index. Drought being one of the main limiting factors of wheat production should be highly preferred in the future wheat improvement programs.

Key words: Wheat; Stress; Drought; Genetic manipulations; Hydroponic culture technique.

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