SUITABLE PRIMING FOR RICE YIELD IMPROVEMENT

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ABSTRACT. Low yield of rice has made reaching self-sufficiency level in Malaysia elusive. So, Malaysia has become a target of rice exporting countries within and outside Asia. To solve this problem, a pre-sowing seed treatment was used as a physiological intervention to alleviate the impeding problems of achieving better growth and yield of Malaysian rice variety MR219. A glass house experiment, which involved the use of solutions of osmotic salts and plant hormones, was used for this investigation. Data on germination percentages, height, number of tillers and productive tillers, tiller efficiency and yield were taken. In both osmopriming and hormonal priming treatments, the highest number of tillers and productive tillers were from pre-germination. The tallest plants from osmopriming were from 150mM treatment, while 50 ppm GA_3 had the tallest in hormonal priming. The highest tiller efficiency for osmopriming was from 150mM and and 200mM sodium chloride, while in hormonal priming it was 200 ppm salicylic acid. For yield per panicle in osmopriming, it was 50mM and 100mM magnesium chloride that had the highest, while in hormonal priming it was 200 ppm methyl jasmonate. Finally, the highest grain yield per hill was produced by 200 ppm methyl jasmonate in hormonal priming, while 50Mm magnesium chloride had the highest yield in osmotic priming. So, it is concluded that the use of 200 ppm methyl jasmonate and 50Mm magnesium chloride could be used as potential hormonal priming and osmopriming, respectively, for yield improvement of MR219 rice in Malaysia.

Keywords: osmopriming; hormonal priming; MR219 rice; growth; yield.

EFFECT OF ROW SPACING AND WEED MANAGEMENT PRACTICES ON THE PERFORMANCE OF AEROBIC RICE

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ABSTRACT. Direct-seeded rice alternative to transplanted rice system is less labor intensive, easier to plant, and consume less water. The advantages of direct-seeded rice have been proved by many research workers, but yet it is not very much adapted by farmers. Weeds reduce cost effectiveness of direct-seeded rice. A study was conducted to evaluate the effect of different row spacing and weed management practices on the performance of aerobic rice at Agronomic Research Area, University of Agriculture, Faisalabad, during summer season of 2013. Fine rice variety 'Super Basmati' was used for experiment in a randomized complete block design with factorial arrangements with three replications. Hand drill sowing with row spacing comprised 15 cm, 22.5 cm, and 30 cm was practiced. Weed scouting hoeing (hand pulling is weed free treatment for comparison with the others and hoeing is a type of mechanical weeding) and pre-emergence herbicide, followed by post-emergence herbicide, were the weed management practices. Weeds data and rice yield parameters were measured. Maximum reduction in weed density (86%) and weed dry weight (79%) was recorded for pre-emergence, followed by for post-emergence herbicide in crop sown at 15 cm row spacing.

Keywords: Super Basmati; weed growth; agronomic practices; treatments.

BARLEY RESIDUES ALLELOPATHIC EFFECTS ON CORN SEED GERMINATION AND SEEDLINGS GROWTH

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ABSTRACT. Allelopathy is the detrimental effect of one crop on germination or development of a plant of another species. A factorial layout within completely randomized design with four replications was used to survey the influence of barley extract on corn seeds. Treatments included plant organs extract (leaf, stem, root and total), and different barley extract densities (Nosrat cultivar) includes four levels of 0%, 25%, 50% and 100%. The influence of barley extract was significant on coleoptile weight, radicle weight, radicle length and coleoptile length. Plant organs had meaningful effect on germination rate, germination percentage, coleoptile weight, radicle weight, radicle length and coleoptile length. Among all experimental characteristics, coleoptiles length was influenced by interaction between barley extract and plant organ. Although, the highest germination rate and germination percentage was related to 25% and 100% of barley extract density, the maximum coleoptile weight, radicle weight, radicle length and coleoptiles length was related to control treatment (0%). Leaf extract has obtained the higher values of germination rate, germination percentage, coleoptile weight, radicle weight, radicle length and coleoptile length. Interaction between control treatment (0% plant extract) and stem extract had obtained the highest coleoptiles weight, radicle weight, radicle length and coleoptile length. Hence, from the obtained results, it can be concluded that the extracts of barley may have allelopathic influence on germination and seedling growth of corn.

Keywords: maize; primarily growth; forage crop; allelochemicals.

EFFECT OF IRON 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, iron spray on the yield and yield components of corn, an experiment was carried out during the crop seasons of 2013 on research Farm in Faizabad of Iran, as a split plot within randomized complete block design with three replications. The main plots with irrigation factor and four levels were considered: level A) 50 ml evaporation from pan evaporation; level B) 100 ml evaporation from pan evaporation; level C) 150 ml evaporation from pan evaporation and level D) 200 ml evaporation from pan evaporation. Sub plots were considered with iron spray in three levels, included level A) 80 g/ha, level B) 130 g/ha and level C) 180 g/ha. The drought stress reduced seed yield, the 1000-kernels weight (TKW), the number of seeds per ear, the number of seeds per row in ear, the number of rows per ear about 39%, 6%, 31%, 14% and 27% less than control treatment, respectively. Using iron, as compared with control treatment, causes the increase of 1000-kernels weight from 295 to 311 g and the increase of seed yield from 5188 to 7078. The results obtained from the present research showed that iron spray has fairly improved the effects caused by drought stress.

Keywords: RWC; pan evaporate; micronutrients; chlorophyll index.

THE SUGAR BEET PRODUCTION FORECAST IN THE REPUBLIC OF MOLDOVA

ANA MACHIDON

ABSTRACT. The production of the sugar beet in the Republic of Moldova (RM) in the last ten years decreased considerably. The world and Moldovan sugar consumption is increasing, therefore making sugar beet an important crop for sugar production. Sugar beet production, as one of the main industrial crops with a significant share in earnings, has an impact on the manufacturing sector of the country. Based on the crop significance, the scope of this research is to forecast the sugar beet production. Five years of forecast were computed for sugar beet production (Yt) in the RM. The research was conducted by the help of data provided by the National Bureau of Statistics. Six time series models were run to find the best solution for Yt forecast. Three of the models were considered the most appropriate. These are: Exponential function trend, Quadratic function trend and Holt's method. The AIC (Akaike Information Criterion), SBC (Schwarz Bayesian Criterion) and R^2 (coefficient of determination) explained that 77,5% of data showed to be optimal for Yt forecast in Holt's method. As a result, the forecast was based on Holt's methodology for time series with trend. Consequently, it was found that Yt will decrease by approximately 15 thousand tonnes by 2022. However, as the data is based on past assumptions, there still exists hope that the production of sugar beet will increase. The same is considered for the average yield, which at the moment is twice lower than in the European Union countries.

Keywords: forecasting methods; time series; trend; raw material; sugar.

COMPARATIVE STUDY ON PHYSICOCHEMICAL PROPERTIES OF SELECTED MANGO (*MANGIFERA INDICA* L.) VARIETIES IN NORTHERN BANGLADESH

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ABSTRACT. Fruits and vegetables are important sources of nutrients for mankind. Among the various fruits available in Bangladesh, mango occupies a vital place in the human nutrition for its delicious taste and higher nutritious value. In this study, five mango varieties, *viz.* Fazli, Amrupali, Langra, Gopalbogh and Misribogh, were tested to evaluate the quality of these mango varieties available in Northern Bangladesh. Physiochemical characteristics, including moisture, ash, total carbohydrates, total solids, total soluble solids (TSS), pH, acidity, total sugars and ascorbic acid contents were evaluated. The results showed that there were significant ($p< 0.05$) differences among mangoes of all varieties for physicochemical parameters. In case of proximate composition, the mango variety Amrupali showed the highest ash content (2.34±0.15) and fat content (1.18±0.13). Protein content (0.94±0.12) and total fiber (2.67%) content was shown to be the highest by Gopalbogh and Misribogh, respectively. The selected mango varieties contained TSS of 12.87~20.55^{o}Brix, pH of 4.45~4.67, titrable acidity of 0.07~0.42%, reducing sugar of 8.40~15.43%, non-reducing sugar of 9.24~10.48%, and total sugar of 18.88~25.12%. The study findings would be helpful for the consumers,

dietitian and industry policymakers.

Keywords: mango; proximate analysis; quality traits.

EFFECT OF COMPOST APPLICATION ON THE GROWTH OF *ACACIA NILOTICA*

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ABSTRACT. *Acacia nilotica* is an important agroforestry specie, which is used in both compact and linear forms. The objective of the current study was to evaluate the effect of compost on the growth performance and biomass production of *A. nilotica*. Completely randomized design (CRD) was used to analyze the variations among several growth morphological traits. Two parallel trials, pot trial (seedlings), field trial (saplings) were conducted simultaneously. Compost and litter mixture were applied in mentioned trials. Following treatments were used: T0 – control; T1 - 25% of compost and 75% of nursery soil; T2 - mixture of 50% nursery soil and 50% compost; T3 - mixture of 75% compost and 25% of nursery soil; T4 - where 100% compost was applied. Increase in plant growth was observed with the increases in the amount of compost mixture. In field trial maximum plant height, shoot length, root length, root-shoot ratio and biomass production was observed when 100% compost level was applied, while minimum was observed without any compost appli-cation. In pot trials, the maximum plant height, root-shoot ratio and biomass production was recorded when 75% compost level was applied. Overall, *Acacia* performed better with 100% of compost application in field trail and 75% of compost application in pot trial. The results of this study demonstrated the positive effects of compost on the growth of *Acacia.* The seedling development was improved considerably with different levels having greater percentage of organic fertilizer and it was concluded that compost improves soil fertility and it should be used as organic fertilizer in farming and forestry practices for improving crop growth and yield.

Keywords: morphological traits; biomass production; litter; organic manure; complete randomized design.

VARIATIONS OF CHLOROPHYLL CONTENT AT *ABIES ALBA* AND *NEPETA PANNONICA* SPECIES ACCORDING TO PHENOPHASE AND HARVESTING AREA

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ABSTRACT. Chlorophylls from plants are photosynthetic pigments. Their quantity offers valuable informations about photosynthetic activity, growing and developing of plants. Photosynthetic pigments decrease quantitatively during senescence process or in stress conditions. The present study has been realized in laboratory conditions with material harvested from spontaneous flora. The purpose of this research was the investigation of variations of chlorophyll content from samples of biological material collected from *Nepeta pannonica* L. and *Abies alba* Mill. plants, from Câmpulung Moldovenesc and Cacica areas, Suceava county, Romania. The targeted phenophases were growth and flowering. There were realized acetonic extracts from samples for

spectrophotometric determinations. Obtained data were processed to estabilish chlorophyll a and b content. There were observed that at *Abies alba* species, from both locations, the chlorophyll a content grew during flowering phenophase, while the chlorophyll b content had little variations. At *Nepeta pannonica* species, the chlorophyll a and b content decreased visibly during the flowering, due to stress. Leaves of plants from this species presented a intense green color in the growing phenophase, while during flowering phenophase they had a purple or yellow colo-ration. Obtained results revealed a different dynamics of chlorophyll content at studied species.

Keywords: photosynthesis, plants, pigments, flowering

EFFECT OF FOOD EXPENDITURE ON FARMING HOUSEHOLDS' WELFARE IN OSUN STATE, NIGERIA

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ABSTRACT. Food and nutrition security remain Africa's most fundamental challenge for human welfare and economic growth. In this study, recent survey data from Osun State, Nigeria, was used to examine the effect of food expenditure on farming households' welfare in Nigeria. Logistic and OLS regression models were the analytical tools used. Food Insecurity Gap (FIG) and Squared Food Insecurity Gap (SFIG) were used to capture the severity of food insecurity among the households. The results showed that, all households sampled consume rice, beans, vegetable, fish and oil as basic food items, while only 32% of them consume potatoes. The regression results showed that the household size, *per capita* income, dependency ratio and age were the highly significant factors influencing food expenditure. However, the coping strategy that was mostly adopted by the farmers in the study area was to cut down on the numbers of food items consumed. Therefore, it was recommended that farm mechanization should be encouraged for optimal land use and productivity. In all, promoting agricultural policies with appropriate price incentives that focus on intensification, diversification and resource-stabilizing innovations will create more wealth for all categories of farming households and this in turn will ensure food security, especially in an era of economic deregulation.

Keywords: food Insecurity; *per capita* expenditure; welfare; innovations; intensification.

ASSA MODELS AND GIS INTEGRATION IN THE DETERMINATION OF FLOODING POINT IN DIFFERENT RETURN PERIODS

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ABSTRACT The quantitative and qualitative management of urban runoff is a very complicated, and the importance of it is added every day. Regardless of the economic and social impacts, water engineers always need to know how to respond to a city's drainage system against different climatic conditions. In this research, the combination of ASSA and GIS models in the returns periods of 2, 5, 10, 50 years were used to determine the flooding points in the 9^{th} district of Mashhad municipality. First, the water-shed boundaries, canals and nodes maps was extracted from the GIS environment. Then, the

ASSA model was simulated for a one hour design for a different return period; the outputs of the model were analyzed in the GIS software environment. The results showed that with increasing rainfall return period, 2806 nodes in underground and superficial networks of 114, 178 and 226 nodes were flooded and inundation during the return periods of 2, 5, 50, 10 years, respectively. Field surveys, existing elevation digital maps of the urban runoff network and simulations have shown that the main cause of inundation is the small size of the cross section of the duct, as well as the low slope in some parts of the network. Adaptation of the results of the simulation of rainfall-induced waterlogging in the study area with what happens every year confirms indicates the correctness of the simulations of the model. Moreover, simulation results of the model also showed that there is a good agreement between the simulated results and the measurement.

Keywords: rainfall simulation; urban runoff; drainage network.