



**Journal of Agronomy
and Plant Breeding**

Vol.10, No.3, 2014

" Abstracts "



In the name of God
Journal of Agronomy and Plant Breeding
Vol.10, No.3, 2014

ISSN:200-88485

Published by:

Islamic Azad University- Karaj Branch

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Correlation of standard germination test with Field seedling emergence of Hybrid Maize (CV. Sc 704) in Summer cropping

A. Aminpour¹, F. Sharifzadeh², R. Jamali Zavareh^{3*}, Sh. Haji Mobin⁴,
M. Esmaeildost⁵

Abstract

The research was conducted at the Safiabad Research Station and central laboratory of seed analysis at Karaj institute of seeds and seedlings registration, control and certification on 20 seed masses of single cross 704 corn hybrids (20 masses means; seeds of the same type but different vigourity) in 4 replicates. In the laboratory, the weight of the seeds was measured and the seed moisture content in the storage was determined. Then the standard germination test was performed according to ISTA rules and the relevant parameters (mean time to germination, mean daily germination, germination rate, germination rate according to Maguir formula and seedling vigor index) were measured. The data was analyzed based on the randomized complete block design. For the field experiments, after reaching the favorable climate conditions, seeds were planted in the field and the emergence of seed vigor index (percentage of seedling emergence, emergence rate and seedling emergence index) was measured and analyzed based on the randomized complete block design. Finally, the correlation between laboratory and field measurement were determined. Analysis of variance showed that among different seed masses, difference of the measured parameters were statistically significant and the comparison of the means showed that the mass imposes the highest viability of seed vigour on other indicators. The correlation between the measurements showed that the germination rate based on Maguir formula imparts significant positive correlation with seedling emergence in the field.

Keywords: corn, standard germination test, field index, Maguir, seedling, vigour

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Study the effective traits on grain yield of Soybean genotypes under different irrigation condition

A.S.Bokaei^{1*}, H.R.Babaei², D.Habibi¹, F.Javidfar² & A.Mohammadi¹

Abstract

In order to understand the internal traits relationships and to determine the main factors in Soybean genotypes characteristics and to study the direct and indirect effects between grain yield and its components, a field experiment was preformed with 15 soybean genotypes using a split plot in randomized complete block design with three replication in 2006 at seed and plant improvement institute, Karaj. Three levels of irrigation 50 (normal condition), 100 (mild stress) and 150 (severe stress) mm evaporation from evaporation pan were considered as the main plot and commercial and promising varieties were used as the sub plot. The traits including phenology, morphology, yield, yield component, oil and protein contents, were measured. Correlation analysis and factor analysis in three irrigation condition showed that biomass, number of pods in plant, number of seed in plant and number of pods in nodes traits had highest positive and significant correlation with grain yield. Path analysis showed that the biomass, number of pods in plant, number of seed in plant and weight of 100 seed had highest direct effects on grain yield. Therefore these traits could be considered for grain yield improvement in soybean.

Keywords: Soybean, Factor Analysis, Path Analysis grain yield irrigation

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Evaluating the Seed and Oil Yield of Exotic and Iranian Safflower Genotypes

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Abstract

To determine eight exotic adaptable safflower genotypes for seed and oil yields (Hartman, Kino 76, Sonora 92, Bacum 92, Saff – 891, Mantel 81, CW 88, Sidwiil) and two Iranian ones (Goldasht, S-55) selected from Ajabshir mass, an experiment was conducted in Bojnourd by RCDB design in 2010-2011. During growth period important traits such as germination time, stem elongation time, days to heading, days to flowering, days to 50% flowering, days to maturity, head number per plant, number of seeds per head, were recorded. The experiment was irrigated after planting, beginning of stem elongation, beginning of flowers appearance, beginning and after flowering, seed filling stage. Analysis of variance was conducted on seed yield, oil percent and yield components. Comparison of means was done after significance of F-test. Results showed Goldasht with 1056 kg/ha seed yield and 304 kg/ha oil yield highest rank. Correlation of seed yield and oil yield, seed yield and head number, number of branches and plant height showed significant correlation between them. Cluster analysis showed that Iranian and exotic genotype were separate together.

Keyword: Safflower, yield and yield components, exotic and Iranian variety, cluster analysis

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Study on contamination of canola seeds in plants infected to blackleg and Sclerotinia stem rot diseases

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Abstract

Diseases of canola including stem white rot caused by *Sclerotinia sclerotiorum* and blackleg caused by *Phoma lingam* are considered as the most important diseases in Iran. Seed infections have their own importance and vary annually under different conditions. For this investigation, 26 canola fields located in three areas of Eastern (Kalaleh), Central (Ali Abad), and Western (Kord-Kouy) regions of Golestan Province were selected to study both diseases. At the cropping season, seed samples of every 10 plants demonstrating the diseases were collected separately and transferred to plant pathology laboratory. Seed weight and seed germination factors were measured for each samples even on non-infected samples. The colonies grown were studied employing fungal identification keys. The seed weight of samples infected to blackleg did not show considerable difference with the control samples whereas sclerotinia had decreased this factor totally. There were not sensible differences between treatments for seed germination. Fungi including *Alternaria*, *Penicillium*, *Aspergillus*, *Rhizopus*, and *Sclerotinia* were identified on seed samples in this experiments. The seeds of blackleg infected plants did not result in seed contamination and only one sample of *Sclerotinia* affected plants demonstrated the fungal colonies of the pathogen.

Keywords: Canola, Disease, *Phoma*, *Sclerotinia*, seed weight, fungi

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Investigation on some qualitative indices of sunflower (*Helianthus annuus* L.) affected by zeolite application and different levels of irrigation

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Abstract

In order to investigate some qualitative indices of sunflower (*Helianthus annuus* L. var. Azargol) with zeolite application and different levels of irrigation, an experiment was carried out in Varamin, Iran, on 2012. Field experiment was conducted based on randomized complete block design with factorial split-plot arrangement each at three replications. Irrigation factor was chosen at three levels including: normal irrigation, drought stress at flowering stage and drought stress at seed filling stage in main plots. Zeolite was used at three levels, no application, 6 ton per hectare and 12 ton per hectare in sub plot. Germination percentage, germination rate, seedling dry weight, radicle, plumule dry weight and oil percentage were measured. The results showed that normal irrigation increased all of the traits and drought stress at flowering and seed filling stages decreased all of the traits. The highest values of the measured traits related to normal irrigation with 12 ton per hectare zeolite application and the difference was not significant with 6 ton per hectare zeolite treatment.

Keywords: irrigation, zeolite, qualitative indices, sunflower.

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Determination of the best seed vigor test for the prediction of germination and yield in soybean

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Abstract

The best seed vigor test for predicting the seedling emergence as well as the relationship with grain yield in soybean was determined. The study was conducted using eight soybean cultivars (Steel, BP, Habit, Harcor, Hil, JK, Klark and Williams). Laboratory tests including germination, seed deterioration and seedling growth tests were carried out and the data was statistically analyzed using completely randomized design. The field experiment was conducted at Islamic Azad University, Pars Abad Moghan Branch experimental station in 2011 and the data was analyzed using randomized complete blocks. The results showed that germination rate (germination test) had the highest relationship with seedling emergence in field and the equation estimate 86% of variation in prediction of seedling emergence using linear regression. The results of variable selection in mode of stepwise procedure showed that only germination rate at germination test had significant effect in the prediction of seedling emergence in the field. Therefore, this trait can be used for the prediction of soybean seedling emergence in the field. Thus this factor can be used for prediction of soybean seedling emergence in field. The results also showed that the correlation between seed vigor (rapid, uniformity and germination percentage) with grain yield was not significant when optimum plant density was applied in the field.

Keywords: Seed vigor; Germination; Grain yield; Soybean.

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Evaluation of different empirical models for the estimation of leaf area in various cultivars of wheat

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Abstract

Leaf area is a key variable in physiological studies. Thus availability of accurate but simple models which can estimate leaf area are prime importance. Therefore for the assessment of empirical models for the estimation of leaf area in non-destructive methods, an experiment based on RCB design was performed using three wheat cultivars (Zarrin, Pishgam, Zare) each in three replicates. The measured traits were length, width, length×width, real leaf area and the dry weight of the leaf. Results showed that in Zarrin cultivar $Y' = e^a \cdot e^{bLDW}$ and $Y' = e^a \cdot LDW^b$ with $R^2=0.60$ and closeness to 1:1 line had a well estimation compared to others models of leaf area. Also, in Pishgam model $LAI = a(DML)^b$ and $Y' = e^a \cdot LDW^b$ had the highest value of R^2 between dry weight and leaf area. Others as: $LAI = a + bL + cL^2$, $LAI = aLW$, $LAI = a(LW)^b$, $Y = a + b(D)$, $Y = e^a \cdot D^b$, $TLAM = aL^bW^c$ models did not show good estimation of leaf area. The results revealed that, models based on dry matter of leaf showed better estimation of leaf area compared to other models

Keywords: Leaf Area, Wheat, Empirical Models, length, width

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Comparison of several extraction methods to extract absorbable potassium in soils of arid and semi-arid regions: case study; Sistan Plains

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Abstract

Potassium is an essential element for plant growth and the major cation for physiological and biochemical activities. Therefore, the knowledge of in the soils will help better application of potassium fertilizers. This study investigates the status of soil potassium in the soil to be used by sorghum and evaluate the common extraction methods. The study was performed on all soil series (12 series) in Sistan plains. The study was designed on factorial experiment in a completely random design with three levels, 100 and 200 mg per kg of potassium in three replicates. Six different methods were used for the extraction of potassium. Results indicated that K application increased yield, concentration and K uptake in sorghum. Based on the values of K extracted, the extraction methods were divided into two groups and in each group, the extraction methods correlated significant. Correlation studies showed that the extraction with ammonium acetate can be introduced as an available K extraction solution.

KeyWords: Available K, Extraction, Sorghum, Sistan soil

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The interaction effect of nitrogen and sulfur on bread wheat grain quantity and quality

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Abstract

Wheat crop has been one of the practical and strategic products and has been cultivated in most countries with suitable climates. This plant usually absorbs high amount of nitrogen during their growth periods, and the greater the amount of nitrogen absorbed, the highest dry matter and grain yield. In addition, the favorable effect of sulfur in salty and alkaline soils increases the yield and quantity of the grain. However, if the plant is faced with the sulfur shortage, the higher application of nitrogen does not influence the protein content of the grain. This research was conducted at Islamic Azad University, Karaj Branch Agricultural greenhouse during 2011 to investigate the interactions between nitrogen and sulfur on yield and quality of wheat. The research was designed based on factorial experiment in a completely randomized design with 6 fertilizer treatments. , the manure treatment 3 treatments of fertilizer nitrogen and sulfur fertilizer treatments (3 nitrogen levels, 3 sulfur levels, each at 3 replicates). After soil preparation and adding nitrogen and sulfur fertilizer in wheat seed sown, finally in May - June 2012, the wheat was harvested. After harvesting, total weight, grain weight, grain weight and straw weight were measured and the content of nitrogen and sulfur in the grain was determined. Statistical analysis and the comparison of means by Duncan's test indicated that the main effect of N on all traits except clusters was significant. The main effect of sulfur was significant for all traits except grain and interaction of sulfur and nitrogen was significant for all traits except panicle. Calculation of NUE showed that nitrogen use efficiency at the application rate of 100 kg N/ha (Level 1) is more than 150 kg N/ha (level 2). Calculation of NARF indicated that the received recycled nitrogen consumption (level 1) is less than (level 2).

Keywords: wheat, Sulfur, Nitrogen, Protein

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Evaluation of the yield of wheat varieties affected by Zn and Fe micronutrient

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Abstract

The micronutrient have essential role in increasing the quality and quantity of wheat and different genotypes of wheat have different behavior on the uptake of micronutrient. This experiment was conducted to examine the effect of the adsorption of micronutrients on wheat yield of the major genotypes grown in West Azarbayjan during the period of 13-821385. The genotype in west Azarbayjan are Alvand, Dorom, Zarin C75-7 and C73-20 and the fertilizer treatment were 1= Control (NPK as required based on soil test), 2= control +50 kg/ha zinc sulfate before planting, 3= control +100 kg/ha zinc sulfate before planting, 4=control +25 kg/ha Fe EDTA, 5= control +50 kg/ha Fe EDTA 6= control +50 kg/ha zinc sulfate +25 kg/ha Fe EDTA, 7=control +50 kg/ha zinc sulfate + 50 kg/ha Fe EDTA, 8=control +100 kg/ha zinc sulfate + 25 kg/ha Fe EDTA and 9=control +100 kg/ha zinc sulfate + 50 kg/ha Fe EDTA. Results showed that the effect of fertilizer treatment and different genotype on grain yield was significant at 1% confidence level. Zarin and Alvand were in first class, the C75-5 was in second class and Dorom with C 73-20 was in third class. The interaction between different fertilizer treatment and different genotype was not significant on straw yield. In general the different genotype yield showed different responses to micronutrient and further research is needed.

Keywords: Wheat, Variety, Micronutrients, Efficiency of Absorption

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