

Feeding effects of chitosan on third and fifth instars of the Cotton bollworm, *Helicoverpaarmigera* (Lep.;Noctuidae)

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Abstract

In this research, digestive effects of different dose rates of two chitosans mixed with an artificial diet were investigated. Experiments were carried out under laboratory conditions (27± 2 °C, 70±5% R.H., and 16L:8D) at six dose rates of 0.0, 2.5, 4.0, 6.0, 8.0 and 10.0 g kg⁻¹ of diet on 3rd and 5th instars of the cotton bollworm. Larval mortality, and antigrowth and antifeedant effects were studied. All feeding experiments was conducted during two days because in both 3rd and 5th stadia lasted two days. According to the results, no mortality was observed in 3rd and 5th instars even by feeding from dose rate of 10.0 g kg⁻¹ of both chitosans. In contrast to expected results, feeding of 3rd and 5th instars of the cotton bollworm from high dose rates of 6.0, 8.0 and 10.0 g kg⁻¹ of both chitosans stimulated the growth and feeding of some larvae in each replication and inhibited the growth and feeding of other larvae in the related replication. In general, both chitosans inhibited the growth and stimulated the feeding of 3rd instars, whereas stimulated both the growth and feeding of 5th instars. Results of this study showed that for better understanding the effects of chitosan and its derivatives on mortality, growth and feeding of larval insects, much more investigations should be carried out on different taxonomic groups of insect pests as well as on their digestive enzymes.

Keywords: Cotton bollworm, *Helicoverpaarmigera*, Chitosan, Growth, Feeding

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Evaluation of salt tolerance indices in cotton genotypes using GGE biplot method

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Abstract

In order to evaluate and compare of the new cotton genotypes and hybrids that were selected through numerous experiments in term of qualitative and quantitative traits, this project was conducted as a randomized complete block design with three replications in two areas of Hashemabad (no stress) and Anbaralum (salinity stress) during two years of 2013-2014. Thirty-eight genotypes were compared with two commercial cultivars of Golestan and Sepid (as control) were evaluated. The measured traits were included cotton yield (1st, 2nd and total harvest), yield components (boll weight, boll number, length and number of sympodial branches), plant height and earlinesspercentage). The results of variance analysis showed that there were significant differences between the genotypes in the years and locations of experimental for the majority of studied traits at a level of 5% or 1%. The highest yield under non-stress condition was was related to Er26, Tj82, Tj135 and DB24 genotypes but the ranking of treatments was different under stress conditions so that Tj174, Er34 and Tj135 genotypes had the highest yield under stress conditions, Genotypes of Er26, Er29 and Tj82 were superior to other genotypes in terms of tolerance index but according to stress sensitivity index (SSI), genotypes of Er29, Tj185 and Er26 were more sensitive. In the graph plotted by the GGE biplot software, the two components justified 94% of the variations. Finally, Tj135, Er38 and Tj82 were selected and introduced as the best and most tolerant genotypes for salinity tolerance.

Keywords: Cotton, Genotype, Index, Tolerance to Salinity

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Effect of planter type and seed variety on seedling emergence uniformity and seed cotton yield in Fars province

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Abstract

Acceptable establishment of cotton seedlings is very important in achieving high yields. A field experiment was conducted to evaluate the effect of planter type and seed variety on emergence uniformity and establishment of cotton seedling. This experiment was conducted as split-plot in a randomized complete block design with three replications at Darab Agricultural Research Station. The seed varieties were included T2 (V1), Karisma (V2), Lidiya (3), Edisa (V4) and B440 (V5) as the main plots and four cotton planter type as the subplots also were included: grain drill with knife opener and conical press wheel (P1), cultivation combination with cultivator (seed drill) with single disk opener and bar covering device (P2), row crop planter with runner opener and rubber smooth-crown press wheel (P3) and direct drill with double disk opener and double rubber band press wheel (P4). The results showed that variety and planter type had a significant effect on sowing depth, germination rate, inter-plant distance, boll number and seed cotton yield. The P2 treatment compared to P1, P3, and P4, caused sowing depth increasing by 39.5%, and germination rate decreasing by 52.1%. The highest and lowest number of boll were observed in $V3 \times P3$ and $V4 \times P2$ interactions, respectively. The finding revealed that seed cotton yield was affected by different planters as $P3 > P4 > P1 > P2$. The results of factor analysis indicated that sowing depth, inter-plant distance, and boll number were known as the most prominent indices of sowing and cotton morphological.

Keywords: Cotton, Germination rate, Variety, Cotton Planter, Sowing depth

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Study of the effect Cryopreservation on seed germination of Varamin and Sajedi cultivars by vitrification method

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Abstract

Germplasm is one of the most valuable resources in the field of science and agriculture, which is very important. The main objective of this study was to study the effect of ultrasound conservation *invitro* on the growth parameters of cotton seeds. Technique of liquid nitrogen storage is one of the methods for preserving seed and other plant tissues in which plant materials can be stored indefinitely and without loss of germination. This experiment was carried out using a completely randomized design with three replications as a factorial on cotton seeds (traits of germination percentage, root length and shoot length). The first factor was genotype with two levels (Varamin and Sajedi) and the second factor was the dewatering time of five levels (20, 40, 60, 80 and 100 minutes) and third factor was considered as type of soluble dewatering in two levels of (PVS2 and PVS3) and control. The results of a variance analysis showed that the effect of cultivar, treatment time and type of solution on germination percentage, root length and shoot length were significant at 1% probability level ($P < 0.01$). Interaction effect of cultivar *treatment time was significant for root length and germination percentage ($P < 0.01$). The effect of cultivar \times type of solution on all traits was significant. The treatment time \times type of solution significantly affected only shoot length, and the triple effect of genotype *treatment time* solution type was only significant in terms of germination percentage ($P < 0.01$). The results of this study can be used to protect cotton seeds germplasm.

Keywords: Cotton, Germination, Dewatering time, Frost, Liquid nitrogen

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Field evaluation of different levels of nitrogen and growth promoting bacteria on yield and yield components of cotton in delayed cultivation

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Abstract

Nitrogen (N) is the most important element limiting crop production in cotton cultivation. As N deficiency in plant decreases the seedcotton yield, excessive N availability will negatively affect crop production,. Therefore, N fertilizer management is very important in cotton farming. *Azotobacter* and *Azospirillum* bacteria have been given much attention in agriculture due to non-symbiotic N fixation and improve plant growth and crop production. In order to investigate the effect of N and *Azotobacter* and *Azospirillum* bacteria on yield and yield components of delayed cultivation of cotton cv.Golestan, a field experiment was conducted with four levels of N fertilizer (0, 30, 60 and 90 kg ha⁻¹ of urea ourceand four treatments of cotton seed inoculation with the two PGPR bacteria (no inoculation, *Azotobacter*, *Azospirillum* and equal combination of *Azotobacter* and *Azospirillum* bacteria). On bases of results, the effect of N fertilizer was significant on yield and yield components of cotton. Also, although seed inoculation with bacteria increased leaf N concentration, yield and other yield components of cotton did not show significant response to bacterial inoculation. The interaction effect between nitrogen and seed inoculation with bacteria was also not significant. According to this experiment's finding, in soil conditions of test site, for double-cropping cotton cv.Golestan, with expected yield less than 2 tons per hectare, nitrogen fertilizer of 75 kg ha⁻¹ is recommended.

Keywords: *Azospirillum*, *Azotobacter*, Golestan cotton cultivar

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Evaluation of distinctness, uniformity and stability of some Cotton (*Gossypium hirsutum* L. and *G. barbadense*) cultivars and genotypes morphological characteristics

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Abstract

In order to evaluate the qualitative morphological characteristics of 36 cotton cultivars and genotypes, 22 qualitative morphological characteristics were studied in Tehran Agriculture and Natural Resources Research Center at Varamin and Seed and Certificate Research Institute at Karaj during 2012 to 2013 years. Results showed that 11 qualitative morphological characteristics were distinct. On the basis of petal color, cultivars and genotypes were divided into two groups of distinct yellow and cream petal. All yellow petal cultivars, long staple cottons and all cultivars and genotypes of cream petal were Upland cottons. Among the yellow petal cultivars, including Dr. Omoumi, Giza and Termez 14, the cultivar of Termez 14 was distinguished from the other two cultivars due to alignment of position of stigma relative to anthers. Cream petal cultivars based on leaf shape were also divided into two groups of palmate and lanceolate. Lanceolate cultivars and genotypes of 3 cultivars were, Sepid, Okra Leaf-Red and Super okra among which they distinguished boll longitudinal shape and seed color of fuzz. Palmate leaf shape cultivars and genotypes group which were evaluated for 31 cultivars and genotypes, were divided into 3 main groups based on boll longitudinal shape. The number of 20 cultivars and genotypes of this group were cultivars and genotypes with ovate boll longitudinal shape which also based on 7 qualitative morphological characteristics including boll pitting of surface, bract dentations at green maturity, position of stigma relative to anthers, leaf lower side density of pubescence, plant shape at green maturity, seed fuzz density and plant type of flowering were distinguished from each other.

Keywords: Morphological qualitative characteristics, Cotton, Cultivar registration and Distinctness, Uniformity and Stability (DUS) test

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Evaluation of Cotton Yield under Irrigation by treated domestic Wastewater

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Abstract

In order to study the effect of treated domestic wastewater of Torbat-Heydariyeh on cotton yield of Varamin cultivar (*Gossypiumhirsutum* L.), a field experiment was conducted as a randomized complete block design with five irrigation water treatments and 3 replications. Treatments included T₁ (well water as control treatment), T₂ (treated wastewater), T₃ (50% well water and 50% treated wastewater), T₄ (alternate irrigation of well water and treated wastewater), and T₅ ((66% treated wastewater and 33% well water combination) (used by regional farmers)). The results showed that the effect of irrigation water treatments on total yield in the first and second years was significant ($P < 0.01$). The highest and lowest total yield in first year was related to T₃ and control treatments at the rate of 3908 and 2342 kg ha⁻¹, respectively. Also, the highest and lowest total yield in the second year was observed in T₃ and control treatments at the rate of 4173 and 3107 kg ha⁻¹, respectively. Totally, the results showed that the research treatments in the second year had a higher yield compared to the first year, so that the treatment of T₃ with maximum total yield in the first and second years had the highest water use efficiency of 0.62 and 0.66 kg m⁻³, respectively.

Keywords: Cotton yield, Wastewater, Water use efficiency, Varamincultivar

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