

Growth and sporulation of some *Gnomonia leptostyla* isolates in various culture media

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Abstract

Walnut anthracnose is the most common disease in common walnut, *Juglans regia* L., in Iran, caused by *Gnomonia leptostyla*. In current research, efficiency of various culture media including BAB, OMA, MA, NA, PDA, CMA, WLEA and WLEOMA in growth and sporulation of the fungus were studied. Three contaminated leaf samples from Miyaneh (No₁), Marand (DV) and Karaj (Md₁) areas were selected and after fungus isolation, they were cultured on mentioned media with three replications. Cultures were incubated in 21°C, 50% RH and 12:12 (L:D) photoperiod and some traits such as maximal colony diameter, colony pattern, mycelium density, sexual and asexual reproduction were investigated after 2, 3, 6, 9, 14 and 21 days. For perithecia maturation, primordial perithecia consisted cultures were incubated in 4°C in darkness for 3 months. There was no significant difference between isolates in morphology, color and growth pattern, but in growth rates and sporulation. Md₁ produced primordial perithecia on the culture without walnut leaf extract but the others were not able to do. No₁ could not sporulate on PDA, WA, CMA and OMA media as much as other isolates. However all isolates could produce immature perithecia and acervuli on WLEA and WLEOMA. The weakest media was BAB and the most suitable media for fungus isolation was WA. Fungus growth rate was in maximum on OMA and the highest density of mycelium was obtained on PDA. Sexual and asexual reproduction has been occurred in best way on media with walnut leaf extract. However, any mature perithecia was not obtained in any culture after three month incubation.

Keywords: Walnut anthracnose, *Gnomonia leptostyla*, media, sporulation, Isolate

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Effect of gibberellic acid on dormancy breaking of *Agria* potato seed mini-tubers

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Abstract

In order to study the effect of gibberellic acid on potato mini-tubers, *Agria* cultivar, newly produced mini-tubers from healthy and diseases free seedlings were studied at four seed size groups (18-22, 13-17, 8-12 and less than 8 mm) after treating with 1000 ppm gibberellic acid in different sampling dates (30, 40, 60, 90 and 110 days after treating with gibberellic acid). Experimental design was completely randomized design based factorial with three replications. Number of days from treating with gibberellic acid to sprouting was considered as dormancy period. Other traits such as number of days to emergence, number of germinated mini-tubers, sprouting percentage and length of buds were measured. Results showed that there were significant differences among gibberellic acid treated and non-treated, different seed size groups, different sampling dates and those interactions for all traits. The earliest sprouting, the most sprouting percentage and the longest sprouts were observed in 18-22 mm seed size group. Therefore it was concluded that gibberellic acid caused decreasing dormancy period of mini-tubers from 90-110 to 40-60 days. Also, the smaller mini-tubers were the late sprouting and had short sprouts.

Keywords: Gibberellic acid, Dormancy, Mini-tuber, Potato, Seedling.

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Comparison of polymorphism in second intron of bovine Leptin gene in Iranian Taleshi and Holstein cattles using PCR-RFLP

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Abstract

There are main differences between two Iranian Taleshi and Holstein cattles in milk and meat production and reproduction traits. In this study, polymorphism in second intron of bovine Leptin gene was investigated in order to find molecular mechanisms of these differences in DNA levels. DNA extraction was carried out according to modified salting procedure from blood of one hundred cattles (70 Taleshi and 30 Holstein cattles) and then was amplified 422 bp from second intron of Leptin gene. PCR products were then digested with Sau3AI restriction enzyme for genotype frequency identification. Results revealed that AA, AB and BB genotype frequencies were 61.42, 31.42 and 7.16 percent for Taleshi native cattles and 56.7, 43.3 and zero percent for Holstein cattles, respectively. Frequency of A and B alleles for Taleshi and Holstein cattles were also 77.1, 22.9 and 78.3, 21.7 percent respectively. According the result, polymorphism rate of Iranian cattles in Leptin gene was low and this might cause some breeding difficulties in future.

Keywords: Polymorphism, Leptin gene, Holstein, Taleshi, Cattle, PCR-RFLP.

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Geometrical optimization of stepped spillway models

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Abstract

Stepped spillways are consist of some steps, which started from top crest of weirs to the down stream of spillways. These structures is used now because of their efficiency in dissipating energy of flow, and their benefits in economical aspects. This kind of spillways are also used in agriculture because of air entrance along them and natural purification of water. This study was carried out to find a mathematical model for estimating the relative dissipation of energy by making 10 physical models of stepped spillways in a laboratory flume. The models were built up to 31 steps, and data was collected by passing many different discharges through them. Effective parameters such as: α , N , H_{dam} , Y_c , and (h, l) were obtained by data analysis and then some important and effective dimensionless parameters for geometric optimization of the stepped spillways were found using a dimensionless technique and analyzing the results. There was a relation between the relative dissipating energy and some dimensionless parameters like yc/h , H_{dam}/yc . Results showed that the best physical model for dissipating the energy was 15 step spillway. Finally, the geometric optimized formula were proposed for mentioned spillway by analyzing the obtained parameters.

Keywords: Stepped spillways, Geometric optimization, Relative dissipating energy, Physical and hydraulical models.

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Evaluation and comparison of two surface tillage and conventional tillage methods on grain yield and yield components of wheat

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Abstract

Every year the degradation of agricultural soils are increasing due to improper tillage operations. The main objective of this study was evaluation and comparison of shallow and conventional tillage methods and their effects on wheat yield and its components. The study was conducted in three consecutive years with two treatments and four replications in Khosroshahr, Iran. Treatments was 1. conventional tillage method comprised of: moldboard plowing at the depth of 20-25 cm, disk harrowing at the depth of 12 –15 cm, leveling, following by chemical fertilizer and planting with grain drill, and 2. Shallow tillage method was included: disk harrowing in the depth of 6-8 cm after removing residue, disk harrowing in the depth of 12 –15 cm in fall, spike tooth harrowing, following by chemical fertilizer and planting with grain drill. The combined analysis of data indicated that there was no significant difference between conventional and surface tillage methods in grain yield, number of heads in unit area, number of grain in the head, 1000 kernel weight, weight of straw and harvesting index. The average wheat yield by conventional tillage was 79 kg more than that of by shallow tillage. This difference might be due to higher plowing depth and better residual burying with mold board plow. The grain yield in surface tillage was 97.5% of the yield in conventional tillage. Conventional tillage consumes more energy compared to shallow tillage, takes more time, causes more depreciation of the implements and therefore increases costs. Considering short available time for cultivation, and also no significant differences in the yield by the two tillage methods, the shallow tillage can be recommended in irrigated wheat farms.

Keywords: Wheat, *Triticum aestivum*, Yield, Yield components, Tillage method.

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Effect of redroot pigweed (*Amaranthus retroflexus* L.) in various densities and emergence times on yield and yield components of sunflower (*Helianthus annuus* L.)

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Abstract

Influence of redroot pigweed in various densities and emergence times on sunflower yield was studied in Miyaneh region of Iran in 2007. The experiment was carried out as randomized complete block design in a factorial arrangement of three pigweed density (1.5, 3 and 6 plants m⁻¹ of row) and five time of emergence (emergence with sunflower, 2, 4, 6 and 8 weeks after sunflower emergence) in three replications. The effect of weed density and time of emergence on sunflower yield, yield component and head diameter were analyzed and described by rectangular hyperbola model. Results revealed that seed number per head, seed thousand weight, head diameter and seed yield significantly decreased with increasing weed density and earlier pigweed emergence. Pigweed emerging up to six weeks later than sunflower did not cause any significant reduction in sunflower seed yield, but even at this time, increased pigweed density reduced the yield.

Keywords: Redroot pigweed, Sunflower, Density, Time of emergence, Competition, Yield, Yield components.

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Evaluation of soil and foliar application of nitrogen at different growth stages on yield and yield components of sugar beet cultivars

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Abstract

In order to evaluate the effects of different application methods of nitrogen fertilizer on sugar beet yield, an experiment was conducted in farms of agriculture faculty of Islamic Azad university, Tabriz branch in 2005. A randomized complete block design based factorial with three replicates used for three cultivars (7233, PP₂₂, and IC) and three nitrogen application methods (seedbed applying of nitrogen, spraying at 6-8 and 14-16 leaf stages). Results showed that applying methods and cultivars had not significant effect on root and sugar yield, but on sugar percentage. Nitrogen spraying on P₂₂ increased root yield more than other cultivars. Among N applying methods, nitrogen spraying was more effective than others. Soil application of nitrogen increased sugar yield in 7233 and IC cultivars, whereas in PP₂₂, the most effective method was nitrogen spraying in 14-16 leaf stage. Nitrogen spraying in PP₂₂ for increasing root yield, and nitrogen spraying at 14-16 leaf stage in PP₂₂, and seedbed applying of nitrogen fertilizer in 7233 and IC cultivars for increasing sugar yield was recommended.

Keywords: Sugar beet, *Beta vulgaris*, Sugar percentage, Fertilizer application method, Root and Sugar yield, Nitrogen

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Study of redroot pigweed (*Amaranthus retroflexus* L.)

phenologic stages at interference with three sunflower hybrids

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Abstract

In order to study of redroot pigweed (*Amaranthus retroflexus* L.) phenology at interference with three sunflower, *Helianthus annuus* L., cultivars, two field experiments were conducted during 2005-2006. Factorial experiments were established on randomized complete block design with three replications. Treatments were combination of three different weed densities (8.3, 25 and 41.7 plants m⁻²) at three relative times of weed emergence (emerged with sunflower, 15 and 30 days after sunflower emergence) using three different sunflower cultivars (Azarghol, Hysun 33 and Allstar RM). Analysis of variance revealed that the year effect was not significant. Redroot pigweed leaf number in each plant decreased significantly, by increasing weed density and delaying of weed emergence time. Sunflower cultivars also indicated different reactions. In redroot pigweeds that emerging with sunflower, branching at densities of 5, 15 and 25 plants/ m⁻² of row delayed 0.67, 0.33 and 2 days in Azarghol, 1.68, 1.33 and 4.33 days in Hysun, in comparison with emergence at 15 days after sunflower, and delaying in Allstar was nearly zero. In three sunflower cultivars, with increasing of density and delaying of emergence time, flowering in redroot pigweed delayed and relative time of weed emergence was more effective than weed density. Earlier emergence of weed has higher effect on flowering delaying of Allstar, compared with two other cultivars. In all sunflower hybrids, time from flowering to seed maturity and growth period of redroot pigweed decreased in treatments with higher sunflower side branches.

Keywords: Redroot Pigweed, Sunflower, Interference, Relative time of emergence, Phenology.

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Effects of salinity stress on some physiologic characteristics of dill, *Anethum graveolens* L.

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Abstract

In order to study the effect of NaCl salinity on some physiological characteristics and accumulation of some mineral and organic matters in dill plant, *Anethum graveolens* L., a completely randomized design was arranged with five salinity levels (0, 25, 50, 75 and 100 mM NaCl) with four replications. Seeds culturing was done in greenhouse and plants irrigated by Hoagland nutrition solution. Total dry weight, stem length, leaf area, total leaf chlorophyll, total soluble sugars and Na⁺, K⁺ and Cl⁻ were measured at the final leaf growth stage. Results showed that total chlorophyll, dry weight, K⁺ in leaves, leaf area, and stem length significantly decreased with increasing salinity levels, while total soluble sugars increased. In addition, the significant increase of Na⁺ and Cl⁻ accumulation in the leaves, particularly at high salinity levels caused nutrient deficiency and ionic toxicity. The sugar accumulation at high salinity levels showed their importance in osmoregulation.

Keywords: NaCl, Salinity, Dill, Chlorophyll, Leaf area.

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