

Response of chickpea (*Cicer arietinum* L.) yield and yield components to sowing date, crop density and weed interference in Lorestan province

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Abstract

Field experiment was conducted to evaluate the effects of sowing date, crop density, and weed interference on yield and yield components of chickpea in Lorestan Province during 2005-06. The experimental was a randomized complete block design by factorial arrangement with 4 replications. The experiment had 3 factors: sowing date at 2 levels (autumn, and winter), crop density at 3 levels (25, 50, and 75 plants m⁻²), and weed interference at 2 levels (weed free, and weed infested throughout the entire growing season). The chickpea grain yield in autumn crop was twice as much winter crop approximately. It seems that the superiority autumn crop is related to coincidence of crop phenology with appropriate water and temperature regime. Chickpea grain yield per area increased 24 and 27% as crop density increased from 25 to 50, and 75 plants m⁻² respectively. By increasing of crop density from 50 to 75 plants m⁻², chickpea grain yield did not increase significantly (only 2.25% excess). It seems that increasing of chickpea density more than 50 plants m⁻² has not any economic advantage. Although, weed density in autumn sowing was approximately three-fold more than weed density in winter sowing, but in weedy condition chickpea grain yield per area in autumn sowing was about 47% more than yield in winter sowing. Weed control caused 58% grain yield increase related to weedy plots. This is show the importance of weed management to achieving chickpea yield potential.

Key words: Chickpea, Sowing date date, Crop density, Weed interference

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Detection of *Beet soilborne virus* in Razavi Khorasan Province by serological and RT-PCR methods

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Abstract

Beet soilborne virus (BSBV) is a member of the genus *Pomovirus*, with rod shaped particles and three plus single - stranded of RNA. BSBV is morphologically similar to *Beet necrotic yellow vein virus* (BNYVV) and both are transmitted by the soilborne fungus, *Polymyxa betae* Keskin that survives in soil for many years. Host range of BSBV is limited to the family of *Chenopodiaceae*. In order to detect and determine distribution of BSBV in Razavi Khorasan Province, in fall and summer of 2005, samples with distinct symptoms of the infection were collected from different fields. Infection of samples with BSBV was confirmed by Triple antibody sandwich (TAS) ELISA. Also RT-PCR test was performed and its results confirmed the results from the ELISA. Total RNA was extracted from roots of infected samples by PEG₆₀₀₀ precipitation method and cDNA was synthesized using random hexamer primers. PCR was performed with the virus specific primers. After electrophoresis on 1.5% agarose, a ~ 400 (399) bp segment was amplified from the infected samples.

Key words: Beet soilborne virus, Pomovirus, TAS-ELISA, PCR test

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Study of drought tolerance indices in maize inbred lines under limited irrigation and normal conditions

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Abstract

In order to genetic investigation of drought resistance indices, on 25 maize inbred lines, an experiment was conducted under three irrigation regimes; normal irrigation, limited vegetative irrigation and limited reproductive irrigation. In the limited vegetative irrigation, TOL (Stress Tolerance) index had the highest phenotypic and genotypic coefficient of variation (83.83% and 68.04% respectively) and SSI (Stress Susceptibility Index) had highest phenotypic and genotypic coefficient of variation (79.59% and 60.19% respectively). The MP (Mean productivity), GMP (Geometric Mean Productivity) and STI indices had highest phenotypic and genotypic correlation with grain yield under limited irrigation and had significance correlation with grain yield, kernel per row, row per ear and 500- grain weight under normal irrigation condition. The results of limited reproductive irrigation also indicated that GMP had highest phenotypic and genotypic coefficient of variation. MP, GMP, STI and SSI (Stress Susceptibility Index) indices showed significant phenotypic and genotypic correlation with grain yield, kernel per row, row per ear and 500- grain weight traits under limited irrigation in reproductive condition. MP, GMP, STI and SSI indices had significant phenotypic and genotypic correlation with grain yield, kernel per row, row per ear and 500- grain weight traits under normal irrigation condition. With consideration of phenotypic and genotypic coefficient of correlation, drought indices that had high correlation with studied traits can be used to improve them.

Key words: Maize, Tolerance index, Drought, correlation, Vegetative stress, Reproductive stress

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Study on the number of Application of Diazinon (G10%) Insecticide Against Striped Stem Borer, *Chilo suppressalis* Walker On Rice Cultivars in Mazandaran Province

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Abstract

In order to optimum utilization of Diazinon on rice stem borer, *Chilo suppressalis* Walker (Lepidoptera: Pyralidae), an experiment was conducted with two factors including, rice varieties (Tarom-Mahalli, Khazar, Nemat) and application times (control with no application, first generation application, second generation application, first and second generations application and four times application). The experiments were based on the completely randomized block design as factorial with 15 treatments and 4 replications. The samplings were conducted before and after the first and second application and at the stages of deadhearts and whiteheads with 5 hills as basis for sampling. The results indicated that year effect was significant on all characters at 1%, but the effects of variety and application times were significant on all characters except yield loss. The effect of year on studied characters showed that the number of infected tillers before and after the first and second applications, deadhearts and whiteheads percentages were the highest in the first year. The variety Tarom-Mahalli had the highest infection at all sampling times. Also, evaluation of the impact of application times on the studied characters indicated that the most infected tillers and whiteheads were observed on the control and second generation application, while the least infection was obtained in the treatments first and second generation application, and four times applications. Results showed that even though Tarom-Mahalli is a sensitive variety to the pest, but one application in first generation could control the pest population and is the safest, and most efficient and economic method for control of *C. suppressalis* on the such an early and medium maturity variety in paddy fields.

Key words: *Chilo suppressalis*, Rice varieties, Application times, Granule Diazinon

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A study on possible effect of using salicylic acid and some of its derivatives for inducing host resistance against tomato stem canker disease

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Abstract

Application of chemicals which activate plant defense mechanisms before pathogen attack without environmental side effects of protective chemical agents have stimulated great deal of researches in this area. One of the important crops in the world is tomato and recently recognized as a model plant for plant-pathogen interactions. Tomato early blight is one of the most devastating disease worldwide, caused by *Alternaria alternata* f. sp. *lycopersici*. In this study possible effect of using salicylic acid (SA) and some of its derivatives including 4-chloro salicylic acid, 5-chloro salicylic acid, 5-methoxy salicylic acid, 5-amino salicylic acid, 5-methyl salicylic acid and 3,5-dinitro salicylic acid in host resistance induction with different concentrations of 200 μ M, 400 μ M and 500 μ M as leaf spray against tomato stem canker disease was investigated. The results demonstrated that application of 200 μ M dosage of chemicals is insufficient dose. Application of SA, 4-chloro salicylic acid and 5-methoxy salicylic acid in concentration 400 μ M reduced disease index significantly comparing with infected control. 5-chloro salicylic acid and 3,5- dinitro salicylic acid were ineffective in this dose. All the chemicals have been tested with concentration of 500 μ M were significantly effective in disease symptoms reduction but also made chlorosis in treated plants. HPTLC results showed highly correlation between increasing endogenous level of SA in treated plants and reduction of necrotic area ($r^2=0.59$) and reduction of lesion number ($r^2=0.82$).

Key words: Systemic acquired resistance, Salicylate derivatives, Tomato, Stem canker, HPTLC



Efficacy evaluation of Ultima (Nicosulfuron+Nimsulfuron), Lumax (Mesotrion+S-metolachlor+ Terbutylazine) and Amicarbazone (Daynamic) in comparison with current herbicide to control of weeds in corn

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Abstract

In order to efficacy evaluation of some new herbicides to control of weeds in corn, a set of field studies were conducted in 2007 at 4 province of Iran, including Tehran (Varamin), Khuzestan, Fars, and Kermansh. Treatments were arranged in a RCBD design with four replications. Treatments consisted of Ultima (Nicosulfuron+Nimsulfuron), Lumax (Mesotrion+S-Metolachlor+Terbutylazine), Amicarbazone (Daynamic), Rimsulfuron (Titus), Nicosulfuron (Cruz), Foramsulfuron (Equio), Atrazine plus Allachlor, EPTC, 2,4-D plus MCPA and weed free. To evaluate the effects of treatments, different characteristics including percent damage based on EWRC scores at 30 days after spraying, percent weed population reduction, percent weed dry mater reduction (separately for each weeds) and yield were measured. According to the result, Ultima at 175 g/ha, as a doual perouse herbicide, could satisfactorily control broadleaf and grass weeds. Lumax still need further evaluations to prove their efficacy and Amicarbazone could not satisfactorily control weeds.

Key words: Rimsulfuron, Titus, Cruz, Foramsulfuron, Equip, Atrazine, Allachlor, EPTC

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Pathogenicity variation of *Didymella rabiei* causal agent of chickpea blight from Ilam and Kermanshah provinces

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Abstract

Ascochyta blight caused by *Didymella rabiei* is one of the most important diseases of chickpea in Ilam and Kermanshah Provinces, Iran. In order to determine the pathogenicity variation of *Didymella rabiei* populations, infected plants in field crops of different regions of both provinces were sampled. One hundred isolates were isolated by chickpea seed meal dextrose agar media. These isolates were categorized in 10 groups based on collection regions. These isolates showed little differences cultural morphological characteristic, for this regard, we chose one isolate as a representative for each group. Pathogenicity of representative isolates from each of the 10 groups were tested on 12 differential chickpea lines as randomized completely block design in the greenhouse condition. Two-week-old plants were sprayed until run-off with a conidial suspension adjusted to 2×10^5 pycnidiospores mL⁻¹. Disease is scored on spore inoculated plants three weeks after treatment. Based on disease reaction on 10 differential chickpea lines 8 virulence forms were identified. The result of this research showed that, there are different virulence forms in two provinces and also population of this fungi composed of several virulence forms. Therefore the efforts should be focused on introduction of multigenic and durable chickpea resistant lines against Ascochyta blight.

Key words: Disease, Host, *Didymella rabiei*, Reaction of cultivars, Pathogenicity group

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Nymphal Survival and Crawler Movement of *Bemisia tabaci* (Homoptera: Aleyrodidae) on Different Varieties of Cotton, *Gossypium hirsutum*

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Abstract

Nymphal survival and crawlers movement of *Bemisia tabaci* (Homoptera: Aleyrodidae) on different varieties of cotton, *Gossypium hirsutum*, was studied on 5 different varieties including, Varamin, Kucker-312, Bulgar-557, Sahel-80, and native (red leaf/red boll) at 24 ± 2 °C, $65\pm 5\%$ RH, 16:8 (L: D) photoperiod in the greenhouse condition. Crawlers' movement was significantly different on the varieties. The highest average movement was $77.93\pm 14.62\%$ on the Native variety, and the lowest one was $17.84\pm 9.71\%$ on Bulgar-557. Mean percentage of survival of the eggs on the native variety was lower than other varieties and significantly different; but it was not significantly different on other varieties and also their different leaf surfaces. Study on the immature life stages from 1st instar to pupa indicated that mean percentage of survival of different life stages was significantly different on the varieties; so that the lowest one was on Native, and the highest one was on Bulgar-557 and Sahel-80. Of the different varieties, Varamin was the only variety which the mean percentage of survival was different on adaxial and abaxial leaf surfaces, as it was determined 65.87 ± 13.45 and 58.12 ± 17.31 percent, respectively. Mean percentage of mortality of different life stages including, 1st to 4th nymphal instars, prepupae, and pupae was separately studied on the adaxial leaf surface of Native variety. The highest and the lowest mortality was occurred in first (between 1st and 2nd nymphal instars) and fifth (between prepupa and pupa) stadia, respectively. Movement of crawlers from abaxial to adaxial leaf surface was not dependent on leaf orientation and photoperiod; therefore, phototropism and geotropism are not effective factors for sweetpotato crawlers' movement, while other factors especially different characteristics of abaxial and adaxial leaf surfaces have the major role in this behavior.

Key words: Survival, Movement, Crawler, *Bemisia tabaci*, Variety, Cotton

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Evaluation the competitive ability of wheat cultivars against flix weed (*Descurainia Sophia*)

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Abstract

In order to evaluate of yield and yield components of eight wheat cultivars against flix weed (*Descurainia Sophia*), an experiment was conducted using a factorial arrangement of treatments in a randomized complete block design with four replications during 2003-2004 growing season in Varamin region. The wheat cultivars were Tabasi, Roshan, Karaj2, Azadi, Niknejad, Mahdavi, Shiraz and Pishtaz. In this experiment traits such as: competitive index, grain yield and yield components of wheat were measured. The results showed that significant differences between cultivars in yield, so results of analysis of variation showed cultivars were significant differences in (HI), but were not significant differences between cultivars under weed-infested and weed-pure condition. The results showed that cultivar Niknejad from the competition ability was superior to cultivars and had a greater yield compare to other cultivars.

Key words: Competitive index, Niknejad, AWC

1,2,3,4 – A Contribution from Tehran Parks and Green Space Organization, plant Protection Research Institute and Science and Research Branch of Islamic Azad University
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Effect of soil solarization on weed seed bank and soil properties

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Abstract

Soil solarization is a simple, safe, and effective method which controls soil born pests and seeds of many conventional noxious weeds. An experiment was conducted to evaluate the effect of soil solarization on weed seed bank in Mashhad, Iran during summer 2007. A factorial experiment based on randomized complete block design with two factors, solarization with Clear and black polyethylene sheets and non-solarized control, and identified species in seed bank, with three replications was used. In order to study effects of soil organic matter, water content and pH on weed seed bank, soil sample were taken and analysed in all plots. Eleven weed species was identified by studying weed seed bank which were mainly annual broad-leaves species. Results indicated that soil solarization with clear polyethylene sheets reduced weed seed bank significantly, but there was no difference between control and black polyethylene sheets. Soil water content was significantly higher in soil covered with polyethylene sheets, but soil pH and total organic matter remained unchanged. There was a significant negative correlation between weed seed density and water content.

Key words: Weed seed bank, Polyethylene sheet, Soil water content

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Fauna of aphids and their coccinellid predators of wheat fields in Mashhad region (Razavi Khorasan province)

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Abstract

During a faunistic survey of wheat aphids and their coccinellid predators in 2006-2008 which was carried out for the first time in Mashhad region, using different sampling methods, 6 aphid species as well as 10 coccinellid species were collected and identified as follows: A) Aphid species: *Sitobion avenae* (Fabricius), *Schizaphis graminum* (Rondani), *Metopolophium dirhodum* (Walker), *Diuraphis noxia* (Mordvilko), *Rhopalosiphum maidis* (Fitch), *Rhopalosiphum padi* (L.); B) Coccinellid species: *Hippodamia* (= *Adonia*) *variegata* (Goeze), *Oenopia conglobata contaminata* (Montrouzier), *Propylea quatuordecimpunctata* (L.), *Brumus undulatus* (Weise), *Exochomus nigromaculatus* (Goeze), *Scymnus apetzi* (Mulsant), *Chilocorus bipustulatus* (L.), *Psyllobora vigintiduopunctata* (L.), *Coccinella septempunctata* (L.), *Coccinella magnopunctata* (Rybakow). Among the identified aphid species in this study, *Sitobion avenae* and *Schizaphis graminum* with 53.1 and 29.5 percentage of population respectively were more abundant than other species. Among the collected coccinellids, the species *Coccinella magnopunctata* is new for fauna of Iran. The following coccinellid species, *Coccinella septempunctata* and *Hippodamia variegata* were more abundant and had higher distribution than the others. The coccinellid, *Coccinella magnopunctata* which was only collected from Akhengan, Toos and Golmakan was considered as a rare species in this study.

Key words: Aphididae, Coccinellidae, Wheat pests, Razavi Khorasan

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Fumigant Toxicity of *Bunium persicum* Boiss. (Umbelliferae) and *Elletaria cardamomum* Maton. (Zingiberaceae) oils against *Tribolium castaneum* (Herbst.) (Coleoptera: Tenebrionidae)

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Abstract

The fumigant toxicities of the essential oils from two spices including Black cumin (*Bunium persicum* Boiss.) and Cardamom (*Elletaria cardamomum* Maton.) were examined on the adults of the rust-red flour beetle, *Tribolium castaneum* (Herbst.). The oils were extracted from the dried fruits of the plants by hydro-distillation using a Clevenger apparatus. The results indicated that both essential oils had high fumigant activity against adult beetles. The mortality of 1-7-day-old adults of both sexes progressively increased as exposure time and/or concentration increased. The males were more sensitive than the females to the both oil vapors. The beetles were more sensitive to the oil vapor of *B. persicum* than that of *E. cardamomum*. The 24-h median lethal concentrations (LC₅₀) of *B. persicum* oil were 7.59 and 9.90 μL^{-1} and those of *E. cardamomum* oil were 22.91 and 30.63 μL^{-1} against males and females, respectively. The results suggested that the essential oils of *B. persicum* and *E. cardamomum* are sources of biologically active vapor that can be used for protecting stored grain against infestation of the rust-red flour beetle.

Key words: Rust-red flour beetle, Essential oils, Cardamom, Black cumin

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Iris yellow spot virus(IYSV) a new viral disease of onion in Iran

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Abstract

Iris yellow spot virus (IYSV) is one of the important pathogens of onion in reported countries. Host range of this virus is very wide and transmitted by onion thrips (*Thrips tabaci*). In survey that was conducted in summer 2006 in onion fields of Mashhad, samples with viral symptoms and high population of thrips have been collected. Since the symptoms were similar to IYSV, special antisera of this virus have been used to check the samples in DAS-ELISA test. Results showed that the majority of collected samples were infected with this virus. This is the first report of *Iris yellow spot virus* (IYSV) on onion in IRAN.

Key words: *Iris yellow spot virus* (IYSV), Onion, DAS-ELISA and Iran

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First record of the eriophyid mite, *Aculus dimidiatus* (Hall) (Acari: Eriophyidae) on eastern cottonwood (*Populus deltoides*) (Salicaceae) in Iran

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Abstract

In 2008, in a field survey on mites associated with poplar trees in Razavi Khorasan province (NE.Iran), specimens of an eriophyid were collected. The specimens were sent to Dr Xia-Yue Hong for identification. As result, the eriophyid *Aculus dimidiatus* (Hall) is recorded from Iran for the first time. The eriophyid reported here was found vagrant on under surface of leaves of eastern cottonwood (*Populus deltoides*) (Salicaceae). Samples of this mite are held in the author's collection at the Ferdowsi University of Mashhad, Iran and in Dr Hong's collection at Nanjing University, China.

Key words: New record, Fauna, Eriophyidae, Iran

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