

Recognition the Principle Agent of Common Crown and Root Rot of Wheat in North Khorasan Province

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Abstract

The common root rot of wheat is appeared as important disease in the recent years in northern Khorasan province, Iran. For this purpose several sampling was performed from diseased fields during 1386-1387. The investigated fields were localized in Shirvan, Farooj, Bojnoord, Esfaraen, Maneh and Samlaghan located in northern Khorasan province, Iran. The samplings were done in seedling, tillage and flowering stages of wheat. The infected parts of plants were cultured on different culture media. Four species *Bipolaris sorokiniana*, *Periconia circinat*, *Coniothyrium cerealis* and *Phoma* sp. were isolated, purified and determined. Pathogenicity of isolates on wheat and their effects on wet and dry weight of plant root system was evaluated in pots containing autoclaved field soil or Perlite infested by inoculum of each isolate. This experiment was realized in greenhouse condition and under water stress treatments. The results showed high similarity between the symptoms appeared on the root of plants inoculated artificially and those of infected naturally in field. There was also significant difference ($P=95\%$) between the mean of dry and the wet weight of plant root system inoculated by different isolates. The minimum and maximum decrease, compared with control, were noted for plants inoculated by *B. sorokiniana* (85.06%) and *C. cerealis* (20.85%), respectively. Such decrease was noted 84.59 and 57.03 % for plants inoculated with *Phoma* sp. and *P. criminate*, respectively. They showed an intermediate cases.

Keywords : Common root rot, Wheat, *Bipolaris*, *Periconia*, *Coniothyrium*, *Phoma*

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Effects of Some Environment Factors on Wild Lettuce (*Lactuca serriola*) Germination

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Abstract

Wild lettuce (*Lactuca serriola*) is an annual weed with seed reproduction. An experiment was conducted to evaluate some environmental effects on germination and emergence of this weed. The type of design was completely randomized with four replications in which factors were arranged as factorial. The experiment was carried out with 11 cm Petri dishes in a germinator (10 °C) and without light. Treatments were PH= 4 to 10, drought strought stress in Polyethylene glycol-6000(PEG) solutions (0 to -0.9) and salinity stress in 7 NaCl solutions (0 to 300 mM). Analysis of variances showed that the effect of PH was not significant on seed germination. But it was significant on mean germination time (MGT), hypocotyle and radicle length. In drought stress treatments, germination percent decreased from 0.55 MPa and was 0 percent in 0.9 MPa. Similar effects were observed about hypocotyle and radicle length. Effect of this treatment on MGT was significant and by increasing in drought stress, MGT increased at first and then decreased. In salinity stress germination was reduced linearly from 50 mM and reached to 0 percent in 200 mM. Reduction of radicle length by increasing NaCl solution followed a second grade function. In contrast hypocotyle length reduced as a linear function.

Keywords: pH, Drought and Salinity Stress, Mean Germination Time, Radicle, Hypocotyle

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Studies on the Effect of some Plant Extracts Mixed with Detergent Against Cotton Whitefly, *Bemisia tabaci* Gennadius (Homoptera: Aleyrodidae)

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Abstract

In recent decades the use of environmentally friendly biological and non-chemical materials for the control of plant pests has found good position. Due to this reason the effect of some plant extracts (kernel extract of *Azadirachta indica* with 1:12.5, fruit extract of Chinaberry, fruit extract of Iranian lilac and leaf extract of Chinaberry with 1:3 with water), cotton seed oil and neem oil at the rate of 3.4 and 2.7 Li/ha, respectively, and half a Kg/ha detergent, amitraz20% EC, 2Li/ha and control, were evaluated against *Bemisia tabaci*, in a R.B.D. with four replications. Observations on pest population were done 3, 5, 7, 10 and 15 days after spraying. From each plot (central row) 10 leaves were selected randomly. Population of nymph was then counted in laboratory. The result showed that there were significant differences among treatments. In 3, 5, 7, 10 and 15 days after spraying the best result (excluding amitraz) was obtained by riped fruit of Chinaberry with 74.62%, neem oil with 77.50 & 80.97%, cotton seed oil with 76.47 & 66.65% reduction of pest population, respectively. The second year results showed that in 3 and 5 days after spraying, the best result (81.93 & 82.47% reduction) was obtained by using amitraz, respectively. Next to amitraz, fruit extract of Chinaberry with 67.15 and 70.00% reduction, respectively was placed in second position. In 7 & 10 days after spraying excluding amitraz, cotton seed oil with 77.85 and 71.87% reduction was placed in first position and fruit extract of Chinberry with 76.27 and 70.80% reduction was placed in second position. In 15 days after spraying, amitraz with 71.27% achieved highest performance and fruit extract of Chinaberry with 69.97% reduction was placed in second position. The comparison of two year results showed that, in second year the percent reduction was somewhat lower than the first year, which may be due to effect of certain ecological factors.

Keywords: Amitraz, Cotton whitefly, Plant extracts, Detergent

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Evaluating of Some Preemergence Herbicides for Lambsquarter and Redroot Pigweed Control in Potato Fields

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Abstract

In order to evaluate the effect of four herbicides (Ethalfuralin, Trifluralin, Pendimethalin and Metribuzin) of potato fields in IRAN for control of Lambsquarter (*Chenopodium album*) and redroot pigweed (*Amaranthus retroflexus*), an experiment was conducted at the green house of Mohaghegh Ardabili University in 2008. A dose-response study was conducted based on completely randomized design with four replications. The potato cultivar was Agria. Herbicides were used in six doses including recommended dose, higher and lower doses. All herbicides were sprayed pre-emergence. Results showed that ranking of these herbicides for weed control were Ethalfuralin, Metribuzin, Pendimethalin and Trifluralin, respectively. Also ranking of herbicides for potato safety were Metribuzin, Trifluralin, Pendimethalin and Ethalfuralin respectively.

Keywords: Ethalfuralin, Trifluralin, Pendimethalin and Metribuzin

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Evaluation of the Effect of Chemical and Non-chemical Weed Management Methods Toward reducing Herbicide Application Rate in Sugar Beet

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Abstract

A Field experiment was conducted at Iranian Plant Protection Research farm in Karaj during 2009 to evaluate the effects of different planting patterns, times of mechanical control and herbicides application on weeds density and biomass in sugar beet farms. The experimental design was split-split plot based on randomized complete block design (RCBD) with four replications. Planting pattern considered as main-plot in three levels including single row planting with 50 cm row width, single row planting with 60 cm row width and twin row planting with 60 cm row width, time of mechanical control in three levels as sub-plot including mechanical weed control at 4-6 leaves stage, 10-12 leaves stage and 14-16 leaves stage (of sugar beet), and herbicides as sub-sub plot in two levels including met amitron plus combination of phenmedipham + desmedipham + ethofumesat and triflurosulfuron-metil plus combination of phenmedipham + desmedipham + ethofumesat. Results of this study showed that times of mechanical weed control and herbicide had significant effect on density and biomass of weeds. In most cases, planting pattern had appropriate effect on weeds biomass reduction that best results were achieved in twin row planting 60 cm. Furthermore, Best results were achieved in mechanical weed control at 4-6 leaves stage of sugar beet that had the most reduction on weeds density and biomass. met amitron plus (phenmedipham + desmedipham + ethofumesat) had also the best effect on weeds density and biomass. Taken together, sugar beet components were not affected by treatments as appropriate as weeds control.

Key word: Planting Pattern, Herbicide, Mechanical control, Weed, Sugar beet

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The Effect of Sowing Date and Weed Interference on Growth Indices of Different Red Bean (*Phaseolus vulgaris* L.) Cultivars

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Abstract

To evaluate the effect of sowing date and weed interference on growth indices of red bean cultivars with different growth habit, a field experiment was carried out during the spring 2009 at University of Zanjan as a factorial split plot on the basis of randomized complete block design, with three replications. Main plots included factorial of three red bean cultivars (Derakhshan (standing cultivar), Sayyad (half-standing cultivar), and Goli (prostrate cultivar)) and sowing date at two levels, (30th of May and 13th of June) and subplots included weed interference (complete weed control and without control). According to the results, the earlier sowing date respect to later sowing date, increased total dry matter and crop growth rate about 1.3 and 1.2 folds, respectively, because of its longer growth duration. The effect of sowing date and weed interference on the leaf area index of cultivars was significant. Weed interference significantly decreased leaf area index (about 40%), total dry matter (about 60%) and crop growth rate (about 48%) of red bean cultivars in both sowing dates. Goli cultivar had the highest (1222 Kg.ha⁻¹) and Sayyad cultivar had the lowest (928 Kg.ha⁻¹) grain yield, respectively. It was concluded that the Goli cultivar respect to other cultivars had good performance in both sowing dates and weed interference and the best candidate for cultivation in Zanjan conditions.

Keywords: Crop growth rate, Leaf area index, Cumulative dry matter, Common bean, Weed control

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The Control's Effect Combination of Microwave Radiation and Cold Storage on Adults *Oryzaephilus surinamensis* and *Tribolium castaneum*

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Abstract

During these protracted years, mankind's main foods consist of grains-specially wheat, oats and rice. Granary production and its storage have been one of the main concerns of a human being for a long time. Microwave radiation as a safe insect control agent could secure high mortality rate of insect population by increasing the temperature of insects' body and its niche. Low temperature affects insects via lowering their growth, feeding and fecundity or lowering their length of life. *Tribolium castaneum* and *Oryzaephilus surinamensis* which are two main stored-product insects were exposed to 2450 MHZ frequency at level power 100 W for 10 min continuously and intermittently. After the treatment, the samples were transferred to a fridge with $6\pm 1^\circ$ C for 48 and 72 h. The results showed that saw-toothed grain beetle was more susceptible to microwave radiation and cold storage than red flour beetle. The results revealed that the penetration pattern of microwave radiation is non-linear and a quadratic equation with significant R-square value fits the data highly well. To evaluate the red flour beetle' behavior under microwave radiation, we set up an appropriate device to measure escape-distance preference. Results showed that the insects preferred short cut for escaping from microwave exposure.

Keywords: Stored product insects, Microwave radiation, Cold storage

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Study of Seed Germination and Morphological Characteristics of a Wild Oat (*Avena ludoviciana* L.) Seedlings Affected by Shoot Aqueous Extracts of Four Medicinal Plants

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Abstract

In order to study the effect of different aqueous shoot extracts of four medicinal plants consist of : basil (*Ocimum basilicum* L.), jimson weed (*Datura stramonium* L.), summer savory (*Satureja hortensis* L.) and meliaceae (*Melia azedarach* L.) on seed germination and seedling characteristics of wild oat an experiment was conducted at Faculty of Agriculture, Ferdowsi University of Mashhad on 2010. A factorial arrangement based on completely randomized design with four replications was used. The experimental treatments were 4 different medicinal plant aqueous extracts as factor A, and extract concentration in 4 levels (0, 20, 40 and 60 percentage) as factor B. Results showed that medicinal plants aqueous extracts in different concentration had significant effect on measured characters. The highest and the lowest percentage and rate of seed germination, length of radicle and hypocotyle, dry weight of radicle and hypocotyle were obtained in treatments of control and aqueous extracts of datura, respectively. Percentage of seed germination, length of radicle and dry weight of radicle and hypocotyle difference were not significant in aqueous extract of Summer Savory compare with control. All concentrations of aqueous extracts significantly diminish all measured characters compare to control (0% concentrations). The lowest percentage and rate of seed germination were obtained in 60% concentration of all studied plant water extracts.

Keywords: Allelopathy, Summer savory, Jimson weed, Basil, Meliaceae

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Nucleotide Sequencing and Symptomology of Two New Isolates of *Watermelon mosaic virus* from Razavi and Northern Khorasan Provinces

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Abstract

During 2008-2009, 323 samples showing mosaic, yellowing, vein banding, leaf malformation and blistering were collected from different Cucurbitaceous plant fields and cucumber greenhouses in Razavi and Northern Khorasan provinces. Through doing DAS-ELISA, 95 samples showed infection with WMV. WMV in samples testing positive by ELISA was confirmed by RT-PCR. RT-PCR assay with specific primers corresponding to the virus coat protein gene led to the amplification of the expected DNA fragment with a length of approximately 822 bp. PCR product from two isolates from Zucchini squash (Shirvan) and melon (Torghabe-Shandiz) were sequenced. The sequenced fragments after multiple alignments using ClustalW2 program compared with other GeneBank isolates. Phylogenetic tree was drawn using Neighbor-joining method of MEGA4.1 program. Phylogenetic analysis showed that Iranian isolates of WMV with 92-99 % nucleotide sequence identity and 96-100% amino acid identity with other isolates of WMV. The nucleotide and amino acid sequence homologies of 2 isolates were found to be 99.1% and 99.6%, respectively. The two new isolates were not similar in symptoms on some indicator plants including *Cucumis sativus*, *C. melo* var. *reticulatus*, *Cucurbita pepo* and *Citrullus lanatus*. These results showed that the two new isolates have high homology with isolates of WMV that previously reported from Iran.

Keywords: *Watermelon mosaic virus*, DAS-ELISA, RT-PCR, Sequencing, Phylogenetic analysis

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The Effects of Combination of Salicylic Acid and *Trichoderma harzianum* BI on Resistance of Tomato Against Root-Knot Nematode, *Meloidogyne javanica*

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Abstract

In this study the effect of combination of *Trichoderma harzianum* BI and salicylic acid were studied on root knot nematode (*Meloidogyne javanica*) disease on tomato under green house conditions. The roots of tomato seedlings at six-leaf stage were inoculated with suspensions of Fungal antagonist (10^6 conidia/ ml), 5mM salicylic acid and 2000 second-stage juvenile (J2). Combined application of Salicylic acid and *T. harzianum* BI could decrease the severity of disease in greenhouse compared with nematode infected treatment as control. Phenylalanine ammonia lyase activity and total phenolic accumulation determined on 1 to 8 days after inoculation. The Using combination of salicylic acid and biocontrol agent caused increase in phenylalanine ammonia lyase activity and total phenolic compound accumulation that reached to maximum level (0.6 μ g/ml and 0.84 μ g/g respectively) 4 days after nematode inoculation. *In vitro* assay showed that salicylic acid and biocontrol agent (separately) increased the death percent of second stage juvenile (J2). In addition *T. harzianum* BI decreased the percent of egg hatching by %84 in laboratory assay. The results indicated that using of combination of salicylic acid and *T. harzianum* BI was able to improve root-knot nematode (*M. javanica*) management on tomato in greenhouse conditions.

Keywords: *T. harzianum* BI, salicylic acid, Biological control, *Meloidogyne javanica*

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Cloning of *luxAB* Reporter Gene into Iranian Plant Pathogen Bacterial Isolates *Pseudomonas syringae* and *Ralostonia solanacerum*

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Abstract

The ability to monitor particular microorganism in an environment is a difficult task. Many genes permit the differentiation of strains by conferring production of unique phenotypes such as bioluminescence [marine bacterial luciferase (*luxAB*)]. Therefore, *lux-AB* gene was cloned into two endemic plant pathogens *Pseudomonas syringae* and *Ralostonia solanacerum* by electrotransformation. *lux*-marking of above strains was carried out using miniTn-5 *luxAB* transposon. Purified strains were transformed with plasmid pUT containing *luxAB* gene by electroporator. Electroporation was performed in voltage 2/5 KV for 5 milisecond. All *luxAB* marked strains could grow on KB agar medium containing 12.5 µg/ml tetracycline and their luminescence intensity was measured by luminometer. *lux*-marked *P. syringae* and *R. solanacerum* were stable genetically engineered strains making them quite appropriate.

Keywords: *Pseudomonas syringae*, *Ralostonia solanacerum*, *luxAB* gene, strain monitoring

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Breif Report

The Effects of Two Control Methods of Cut and Shade on Aquatic Weeds Growth of Coontail and Watermilfoil under Laboratory Condition

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Abstract

Coontail (*Ceratophyllum demersum*) and Watermilfoil (*Myriophyllum spicatum*) are current submersed weeds in many fresh waters of Iran. The excessive growth of these plants causes the reduction in utilization of water resources and making some ecological and economical damages in these areas. The aim of this study was to determine the response of two submersed aquatic weeds of Coontail and Watermilfoil to light reduction, cutting (without, once and twice) and their incorporation under laboratory (aquarium) condition. The experiment was conducted in factorial design, with three replications. The experimental traits included the length and dry weight of plants. The experimental results showed that, cutting and shading caused a significant effect ($P \leq 0.01$) on length and dry weight of test plants. Also, twice cutting compared with once, due to more reduction in plants carbohydrate storage resulted in better control of both species.

Keywords: Dry weight, Length, Light and Nutrients

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Breif Report

The First Report of *Anthidium diadema* (Latreille, 1809) (Hym.: Megachilidae) From Iran

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Abstract

Comparing with the numerous studies carried out in other countries, information on Apoidea superfamily in Iran is scarce. During a faunistic survey of pollinator bees associated with alfalfa fields in Mashhad and Chenaran regions in 2010, numerous specimens of Apoidea superfamily were collected and identified. Among the identified species, *Anthidium diadema* (Latreille, 1809) is record for the first time from Iran. All identifications confirmed by Dr.C.D.Michener in the Natural History Museum, University of Kansas U.S.A.

Keywords: Insect pollinators, New record, Iran

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