Arab and Near East Plant Protection Newsletter

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ARAB AND NEAR EAST PLANT PROTECTION NEWSLETTER

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News and announcements from all on any aspect of plant protection in the Arab world are invited for the Newsletter. Contributions from the Executive Committee of the Arab Society for Plant Protection and from the four Subject Matter Committees, as well as from national societies in the Arab region dealing with any aspect of plant protection are kindly requested and highly appreciated.

EDITORIAL

Biorational Pest Control – a rapid growing sustainable control strategy

Biorational pest control involves application of a pesticide originated from natural source which is safe, residue free, rapidly biodegradable soft chemicals to grow crops with minimal use of pesticides. The main objective of biorational pest control is to optimize pest control in an economically and ecologically sound way. The term biorational derived from two words, biological and rational, referring to pesticides of natural origin that have limited or no adverse effects on the environment or beneficial organisms. Biorational pesticides are becoming popular due to environmental awareness and consumer concern. Biorational pesticides have different modes of action compared with conventional or traditional pesticides, with greater selectivity and considerably lower risks to humans, wildlife and the environment.

Biopesticides are effective in very small quantities and often decompose quickly, thereby resulting in lower exposures and largely avoiding the pollution problems caused by conventional pesticides. Moreover, biopesticides are selective to target pest and closely related organisms, in contrast to broad spectrum, conventional pesticides. With consistent performance, the future growth rate of biorational pesticides over the next ten years is expected to increase 10-15% annually in comparison to 2% for chemical pesticides. In 2008, total world Crop pesticide market was 25 billion US Dollar where share of Biological control was 3% (750 Million US$). However, world Crop Biocontrol Market is expected a growth of 2800 Million USD by 2015 (source: Global Industry Analysts Inc.) and $3.4billion by 2017.

Recently 122 biochemical pesticide active ingredients (a.i.) were registered with the Environmental Protection Agency (EPA), which include 18 floral attractants, 20 plant growth regulators, six insect growth regulators, 19 repellents, and 36 pheromones.

Developed countries pay great attention to the projected rapid pace of the development of biopesticides. In Canada, between 1972 and 2008, the Pest Management Regulatory Agency approved registration of 24 microbial active substances with 83 formulations. The majority of the registrations (55/83) occurred since 2000 and at the beginning of 2008 there were 10 new products.

As of October 2008, there were 327 biopesticides formulations that have been registered in China, accounting for 1.6% of total registered pesticide products. Use of biorational pesticides products will unlock a new market for developing countries fresh vegetable and fruit growers to comply with export legislation Eurepgap with residue free produces.

In the Arab World there is no substantial production of biorational products, however few trials have been started in the beginning of the year 2000 by scientists in Iraq to formulate and commercialize the Btk. which stopped later due to the UN sanctions .*Trichoderma* is being produced and marketed now by an Iraqi company. Production of Btk and also viral strains against cotton worm in Egypt has been manufactured locally.

By 2050, it is estimated that the world population will reach around 9 billion people. The Near East and Arab countries region will strongly feel the squeeze, as its share from the population increase and food shortage will be higher than the global average. To face the future demand we need abundant safe and nutritious food. To accomplish this goal requires an ability to meet the grand challenge of adaptation to climate change, while preserving the natural habitats. Plant science, including plant protection, is trying to cope with this challenge, and it is timely to ask what questions should the next generation of plant protection scientists address

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❖ Crop Protection News from Arab and Near East Countries

INVASIVE AND NEW PESTS

IRAN

First Report of *Tomato ringspot virus* Infecting Pepper in Iran. Chili pepper (*Capsicum frutescens*) represents an important crop in Iran and is under cultivation in different regions in Northern Iran. In spring 2012, commercially grown tabasco (*Capsicum frutescens*) peppers in Varamin, Shahriar, and Karaj districts of Tehran province developed an undescribed disease. Symptoms observed were mosaic, leaf malformations, and stunting. Fruit symptoms included chlorosis and distortion. To verify the identity of the disease, six fields were surveyed and 72 symptomatic leaves were collected and screened by double antibody sandwich (DAS)-ELISA using specific antibodies to *Tobacco ringspot virus* (TRSV), *Tomato ringspot virus* (ToRSV), *Pepper mild mottle virus* (PMMV), *Tomato mosaic virus* (ToMV), *Tobacco mosaic virus* (TMV), and *Arabis mosaic virus* (ArMV). ToRSV was found in 23% of the samples collected. None of the samples had a positive reaction to other tested viruses. The ToRSV-positive peppers were used for mechanical transmission to *Chenopodium quinoa*, local lesion host, and after two cycles of single local lesion isolation, they were transferred to *Cucumis sativus, Solanum esculentum*, and *Capsicum fructescens*. Inoculations resulted in systemic mosaic and chlorotic local lesion on *C. sativus*; leaf distortion and mosaic on *S. esculentum*; and mosaic, mottle, and stunting on *C. fructescens*. All inoculated plants were positive for ToRSV with DAS-ELISA. To further verify ToRSV infection, reverse transcription (RT)-PCR was conducted. Two primers were designed on the basis of the highly conserved sequences of the putative viral polymerase gene available in the GenBank. RT-PCR of total RNA extract from infected peppers and inoculated plants with the designed primers RdR-R (5′-CGCCTGGTAATTGAGTAGCCC-3′) and RdR-F (5′-GAAGAGCTAGAGCCTCAACCAGG-3′), consistently amplified the 411-bp product, while no amplification products were obtained from noninfected control (healthy plants). The fragment from tabasco pepper was cloned into pTZ57R/T (Ins T/A clone PCR Cloning kit, Fermentas, St. Leon-Rot, Germany) and sequenced in both directions of three clones. The resulting nucleotide sequence (GenBank Accession No. JQ972695) had the highest identity (94%) with the polymerase gene of a ToRSV isolate from blueberry cv. Patriot (Accession No. GQ141528) and had lower identity (91%) with that of a ToRSV isolate from blueberry cv. Bluecrop (Accession No. GQ141525). *Tomato ringspot virus* (ToRSV) is reported to infect *Capsicum* spp. in the United States. Our results confirm the natural infection of pepper plants in Tehran by ToRSV. To our knowledge, this is the first report of ToRSV infection of pepper in Iran. The finding of this disease in Tehran confirms further spread of the virus within northern regions of Iran and prompts the need for research to develop more effective management options to reduce the impact of ToRSV on pepper crops. Beside, primers designed on the basis of putative viral polymerase gene sequences may improve the detection of ToRSV isolates by RT-PCR in Iran. [Y. Sokhansanj, F. Rakhshandehroo and R. Pourrahim (Iran). Plant disease, 96(12): 1828, 2012].

LEBANON

First Report of *Watermelon chlorotic stunt virus* in Cucurbits in Lebanon. In August 2009 in the Marjyoun region in South Lebanon, severe yellowing symptoms on melon (*Cucumis melo*) and pronounced dwarfing and mosaics on watermelon (*Citrullus lanatus*) led to significant yield losses. *Watermelon chlorotic stunt virus* (WmCSV), genus *Begomovirus*, family *Geminiviridae*, was suspected. Symptomatic samples were collected close to the end of the growing season from several fields. The small scale CTAB protocol was followed for nucleic acid extraction. Samples were tested by PCR for WmCSV and *Squash leaf curl virus* (SLCV) using specific primers for SLCV and newly designed WmCSV specific primers: (WMAR1: 5′ TTTTCCGACACGATGAGTGAT 3′; WMAF3: 5′ ACTGGACTTAGCGCTTTGTAT 3′; amplicon size 1,061 bp). Of 39 symptomatic samples, 90% were infected with WmCSV, 13/14 (93%) melon samples and 22/25 (88%) watermelon samples, while 64% were infected with SLCV, indicating a high incidence of mixed infections. In November 2009, no cucurbits were found in Marjyoun since farmers refrained from planting late crops after devastating losses in the previous year. Therefore, 92 samples were collected from other southern regions and 114 samples from northern regions. All squash samples had leaf curl symptoms, while 75 to 85% of cucumber and melon had yellowing symptoms. No WmCSV was detected in North Lebanon, even though 100% of squash samples and 79% of other cucurbit samples were positive for SLCV. However, in South Lebanon, WmCSV was detected 9/20 (45%) in melon, 12/32 (38%) in cucumber (*Cucumis sativus*), and 6/40 (15%) in squash; while the incidence of SLCV was high particularly on squash (39/40, 98%) and cucumber (30/32, 94%) followed by melon (7/20, 35%). The survey was repeated in 2010, and the previous year's results were confirmed: no WmCSV was detected in North Lebanon, while 39/40 (98%) melon samples tested in November were positive for SLCV. In southern Lebanon, WmCSV was not

detected in melon or watermelon samples collected in June; however, in November it was detected in 11/23 (48%) squash and 9/33 (27%) melon. WmCSV genome was amplified by rolling circle amplification (RCA) using the TempliPhi Amplification Kit (GE Healthcare) The RCA product was sequenced using mostly locally designed primers, and the sequences were submitted to GenBank: WmCSV DNA A: HM368371.1; WmCSV DNA B: HM368372. Phylogenetic analysis showed that WmCSV DNA A was most closely related to isolates from Israel (EF201809.1) and Jordan (EU561237.1), sharing 99% nt identities with both isolates; WmCSV DNA B was found to be most closely related to an isolate from Israel (EF201810.1), with 98% nt identity. WmCSV was first detected in Yemen but was detected quite recently in Israel and Jordan. Within a short period, Lebanon experienced the introduction of two new whitefly transmitted begomoviruses. WmCSV seems so far to be restricted only to South Lebanon, while SLCV is widespread. The synergistic interaction between a mixed infection by SLCV and WmCSV in melon resulted in significant symptom enhancement, plant shortening, and up to 54% yield reduction in summer. Hence, the development of resistant varieties coupled with the implementation of adapted integrated pest management strategies would be essential for successful production of cucurbit crops. [J. Samsatly, H. Sobh, M. Jawhari, C. Najjar, A. Haidar and Y. Abou-Jawdah (Lebanon). Plant disease, 96(11): 1703, 2012].

SAUDI ARABIA

First Report of Bacterial Spot Caused by *Xanthomonas campestris* pv. *vesicatoria* on Sweet Pepper (*Capsicum annuum* L.) in Saudi Arabia. In the summer of 2009 and 2010, 18 sweet pepper fruit with blister-like, raised, rough lesions were collected from four greenhouses (total of 0.1 ha) in the Al-Kharj region of Saudi Arabia. All samples were collected from commercial crops of the sweet pepper cv. California Wonder. Disease incidence was ≤5%. Isolations were made from all diseased fruits. A small piece (3 mm^2) of symptomatic tissue from pepper fruit was placed in a sterile mortar and macerated in sterile distilled water with a pestle. A loopful of bacterial suspension from each sample was streaked onto Tween B agar medium. Plates were incubated at 28°C for 48 h. Single yellow, circular, butyrous, shiny colonies were picked from the plates and transferred to nutrient agar plates containing 5% D+ glucose agar (NGA). Gram-negative, rod-shaped bacteria were consistently isolated from the fruit and 10 of the isolates were identified as *Xanthomonas campestris* pv. *vesicatoria* on the basis of morphological, physiological, and biochemical tests. The isolates were oxidase positive and levan negative, arginine-dihydrolase positive, and did not macerate potato discs. The isolates were also non-fluorescent, grew at 37 and 4°C but not at 40°C, did not liquefy gelatine or starch, but did produce H_2S. The identity of the 10 bacterial strains was confirmed by PCR assay using primers RST65 and RST69. Four-week old pepper plants (cv. California Wonder) were inoculated by spraying five potted plants with each isolate using a bacterial suspension (10^8 CFU/ml). Sterile distilled water was sprayed on an additional five plants as a negative control treatment. The bacterial isolates caused necrotic lesions, each with a yellow halo, on leaves of inoculated plants. Bacteria reisolated from the necrotic lesions using the technique previously described were identical to the original strains according to the morphological, cultural, and biochemical tests described above. Negative control plants inoculated with sterile distilled water did not show symptoms and no bacterial colonies were recovered from them. To our knowledge, this is the first report of bacterial spot on pepper fruits in Saudi Arabia. [Y. Ibrahim and M. Al-Saleh (Kingdom of Saudi Arabia). Plant disease, 96(11): 1690, 2012].

TURKEY

First Report of Fire Blight Disease on Blackberry in Turkey. During 2008 and 2009, a new disease on blackberry (*Rubus fruticosus* cv. Chester) causing leaf and shoot blight and cankers with brown discoloration of necrotic tissues on mature branches was observed in Isparta and Konya provinces of Turkey. Disease incidence was estimated to be 4% for the two years. Isolations were made from lesions on leaves and shoots on nutrient sucrose agar (NSA) medium. Bacteria consistently isolated from the diseased tissues were identified on the basis of biochemical, physiological, and molecular tests. Eleven representative bacterial strains were gram-negative, rod-shaped, mucoid, fermentative, yellow-orange on Miller and Scroth (MS) medium, positive for levan formation and acetoin production, no growth at 36°C, positive for gelatin hydrolysis, and negative for esculin hydrolysis, indole, urease, catalase, oxidase, arginine dehydrolase, reduction of nitrate, acid production from lactose, and inositol. Two reference strains of *Erwinia amylovora* (EaP28 and NCPPB 2791) obtained from the culture collection unit of Selcuk University were used as positive controls. All strains induced a hypersensitive response in tobacco (*Nicotiana tobaccum* cv White Burley) 24 h after inoculation with a 10^8 CFU/ml bacterial suspension in water. All strains were identified as *E. amylovora* using the species-specific primers set A/B, which amplified a 1-kb DNA fragment in PCR, and fatty acid methyl ester (FAME) profiles determined by Sherlock Microbial Identification System software (TSBA 6 v. 6.00; Microbial ID, Newark, DE) with similarity indices ranging from of 79 to 99%. Pathogenicity was confirmed by injecting bacterial suspensions (10^8 CFU/ml^{-1}) in sterile distilled water into the shoot tips of 2-year-old *R. fruticosus* cv. Chester and the first blighting symptoms were observed on leaves

within 3 days and also 10 days later after inoculation on shoots. Sterile distilled water was used as a negative control. No symptoms were observed on control plants. All tests were repeated three times. The bacterium was reisolated from inoculated plants and identified as. *E. amylovora*. To our knowledge, this is the first report of *E. amylovora* on blackberry in Turkey. Phytosanitary measures are needed to prevent any further spread of the bacterium to new blackberry areas. [K. K. Bastas and F. Sahin. (Turkey). Plant disease, 96(12): 1818, 2012].

First Report of *Erwinia amylovora* on Firethorn (*Pyracantha coccinea*) and Mountainash (*Sorbus* sp.) in Turkey. Fire blight, caused by the bacterium *Erwinia amylovora*, is a serious disease of apples (*Malus* spp.) and pears (*Pyrus* spp.) but can also infect many ornamental species in the Rosaceae family. In the summers of 2009 and 2010, leaf and shoot blight and reddish colored cankers were observed on firethorn (*Pyracantha coccinea*) and brown discolored leaves and necrotic stem lesions on mountain ash (*Sorbus* sp.) both from the landscape areas of Konya province. Investigation of these symptoms showed that in an 85-ha area, disease incidence was estimated at 1.5% and 1% on firethorn and mountain ash, respectively. Bacteria were consistently isolated from both leaf and lesions onto nutrient sucrose agar medium. Nine representative bacterial colonies from firethorn isolations and six from mountain ash isolations purified and characterized as gram-negative, rod-shaped, mucoid, fermentative, yellow-orange on Miller & Scroth medium, positive for levan formation and acetoin production, no growth at 36°C, positive for gelatin and esculin hydrolysis, and negative for indole, urease, oxidase, arginine dehydrolase, reduction of nitrate, and acid production from lactose and inositol. Two reference strains of *E. amylovora* (EaP28 and NCPPB 2791) obtained from culture collection at Selcuk University, Department of Plant Protection, Konya, Turkey, were used as positive controls. All strains induced a hypersensitive response in tobacco (*Nicotiana tobaccum* cv. White Burley) and produced ooze when stab inoculated on immature pear fruits. In addition, all strains and the references were identified as *E. amylovora* on the basis of a 1-kb DNA fragment amplification with a species-specific primer set, A/B in PCR. Pathogenicity tests were performed by injecting a bacterial suspension (10^8 CFU ml^{-1}) into the shoot tips of 3-year-old firethorn and mountain ash seedlings, resulting in leaf and shoot blight symptoms observed 10 to 15 days after inoculation. No symptoms were observed on control plants treated with sterile water. *E. amylovora* was positively reisolated from leaf and shoot lesions from the inoculated seedlings and identified as described above. To our knowledge, this is the first report of *E. amylovora* on *P. coccinea* and *Sorbus* sp. in Turkey. [K. K. Bastas (Turkey). Plant disease, 96(12):1818, 2012].

First Report of Fire Blight Disease Caused by *Erwinia amylovora* on Rockspray (*Cotoneaster horizontalis*) in Turkey. In the late summer and early winter of 2008 and 2009, leaf and shoot blight and cankers with reddish and brownish necrotic tissue on mature branches of *Cotoneaster horizontalis* were investigated in landscape areas of Konya province in Turkey. Disease incidence was estimated at 2%. Bacteria were consistently isolated from the lesions on leaves and shoots on nutrient sucrose agar medium. Twelve representative bacterial strains were isolated and characterized as gram-negative, rod-shaped, mucoid, fermentative, yellow-orange on MS medium, positive for levan formation and acetoin production, no growth at 36°C, positive for gelatin hydrolysis, and negative for indole, urease, oxidase, arginine dehydrolase, reduction of nitrate, and acid production from lactose and inositol. Two reference strains of *Erwinia amylovora* (EaP28 and NCPPB 2791) obtained from the culture collection unit of Selcuk University were used as positive controls. All strains induced a hypersensitive response in tobacco (*Nicotiana tobaccum* cv. White Burley). All strains were identified as *E. amylovora* on the basis of amplification of a 1 kb DNA fragment with a species-specific primer set, A/B by PCR, and fatty acid methyl ester profiles determined by Sherlock Microbial Identification System software (TSBA 6 v. 6.00; Microbial ID, Newark, DE) with similarity indices ranging from of 83 to 96%. Pathogenicity tests were performed by injecting 20 µl of a bacterial suspension (10^8 CFU ml^{-1}) into the shoot tips of 3-year-old *C. horizontalis* seedlings. Leaf and shoot blighting symptoms were observed within 10 to 15 days, but no symptoms were observed on control plants treated with sterile water. The bacterium was reisolated from the lesions on leaves and shoots and identified as described above. To our knowledge, this is the first report of *E. amylovora* on cotoneaster in Turkey. Control measures are needed to prevent any further spread of the bacterium to new landscape areas. [K. K. Bastas and F. Sahin, Yeditepe (Turkey). Plant disease, 96(11): 1690, 2012].

RESEARCH HIGHLIGHTS

EGYPT

Susceptibility of different life stages of Indian meal moth *Plodia interpunctella* (Hübner) and almond moth *Ephestia cautella* (Walker) (Lepidoptera: Pyralidae) to modified atmospheres enriched with carbon dioxide. The susceptibility of the different life stages of the Indian meal moth *Plodia interpunctella* and almond moth *Ephestia* (*Cadra*) *cautella* to different modified atmospheres (MAs) containing various concentrations of carbon dioxide (CO_2) was studied as an alternative to methyl bromide fumigation at 27 °C and 60 ± 5% relative humidity (r.h.). The MAs tested were 40%, 60% and 80% CO_2 in

air at different exposure times. Results showed that five days were adequate to kill all eggs and pupae of the two moths under all tested MAs. Exposure time needed to be extended to 6 and 7 days at 80% CO_2 to obtain complete mortality of larva of *E. cautella* and *P. interpunctella*, respectively. The order of sensitivity of *P. interpunctella* to MAs was: egg = pupa > larva, while for *E. cautella* it was: pupa > egg > larva. Generally, eggs and pupae of *P. interpunctella* were more sensitive to MAs than those of *E. cautella* but the larvae of the latter were more sensitive. [Sayeda S. Ahmed and Mohamed Y. Hashem (Egypt). Journal of Stored Products Research, 51: 49-55, 2012]

Food consumption and utilization by *Tribolium confusum* du Val (Coleoptera: Tenebrionidae) larvae and their susceptibility to the acetone extract of *Nerium oleander* **L. (Apocynaceae) leaves in relation to three types of flour.** The nutritional indices of *Tribolium confusum* larvae reared on wheat, barley and corn flour and their susceptibility to acetone extracts of *Nerium oleander* leaves were studied. In addition, the concentrations of total protein, carbohydrate and lipid in the flours and the larvae reared on them were also determined. Although the lowest consumption index and relative growth rate (RGR) were obtained in larvae reared on corn flour, these showed the highest weight gain. No significant difference was apparent between the three types of flour in terms of digestibility, or between the RGR of larvae reared on barley and corn flour. In contrast, the RGR of larvae reared on wheat flour was significantly higher than that for those reared on barley and corn flour. The highest food utilization, in terms of the efficiency of conversion of ingested and digested food into biomass, was reached in larvae reared on corn flour. Larvae reared on wheat and corn flour had the highest and lowest total protein contents, respectively, while larvae reared on corn and barley flour had the highest and lowest total lipid contents, respectively. On the other hand, no relationship was evident between larval and flour total carbohydrate content. The present study showed that larvae reared on corn flour were more tolerant to acetone extracts of *N. oleander* leaves than those reared on wheat or barley flour. The relationship between the total protein, carbohydrate and lipid contents in the flour and the larval nutritional indices, and also the susceptibility of larvae to the botanical extract, were discussed. [El-Sayed H. Shaurub and Genan M. Abou Gharsa (Egypt). Journal of Stored Products Research, 51: 56-60, 2012].

OMAN

Population Structure and Management of *Podosphaera pannosa* Associated with Peach Powdery Mildew in Oman. In 2004, severe powdery mildew infection on peach occurred in Al-Jabal Al-Akdhar, Oman, and resulted in substantial yield losses to growers. This study was conducted to investigate occurrence, causal agents, genetic diversity and efficacy of azoxystrobin in management of this disease. Powdery mildew was observed on all farms and peach trees in Al-Jabal Al-Akdhar. Disease symptoms were first observed on shoots in April, followed by appearance on fruits. Disease severity reached its peak between May and June. Morphological and molecular identification of 22 powdery mildew isolates indicated that all belong to *Podosphaera pannosa. Podosphaera pannosa* reproduced the same symptoms upon inoculation on peach leaves. Amplified fragment length polymorphisms analysis of 35 isolates of *P. pannosa* from five different villages using four primer pair combinations produced 688 polymorphic loci and 35 different genotypes. Populations of *P. pannosa* were found to have low levels of gene diversity (H = 0.1858), which suggests that *P. pannosa* has been recently introduced into Al-Jabal Al-Akdhar. Analysis of molecular variance showed low levels of genetic differentiation among populations from the different villages, implying the introduction of *P. pannosa* into the different villages via common sources as well as frequent movement of pathogen inoculum among the different villages. Evaluating the efficacy of azoxystrobin showed that azoxystrobin is as efficacious as thiophanate-methyl in managing the disease, with sulphur being the least efficacious. The study is the first to report the presence of *P. pannosa* in Oman. Also reported are its genetic diversity and its management under commercial conditions. [Abdullah M. Al-Sadi, Ibtihal J. Al-Raisi, Masood Al-Azri, Hamoud Al-Hasani, Mohammed S. Al-Shukaili, Saif M. Al-Shuraiqi, Khater O. Al-Fahdi, Mike L. Deadman (Oman). Journal of Phytopathology, 160(11-12): 647-654, 2012].

PAKISTAN

Determination of Rust Resistance Gene Complex Lr34/Yr18 in Spring Wheat and its Effect on Components of Partial Resistance. The non-durable nature of hypersensitive (race-specific) resistance has stimulated scientists to search for other options such as race-non-specific resistance to provide long-lasting protection against plant diseases. Adult plant resistance gene complex *Lr34/Yr18* confers a dual race-non-specific type of resistance to wheat against stripe rust (*Puccinia striiformis* f. sp. *tritici*) and leaf rust (*P. triticina* Eriks). This study was conducted to evaluate 59 spring bread wheat (*Triticum aestivum* L.) genotypes for the presence of the *Lr34*/*Yr18*-linked *csLV34* allele using STS marker *csLV34* and to determine the effect of this gene complex on the components of partial resistance in wheat to leaf/stripe rust. *Lr34*/*Yr18*-linked *csLV34* allele was detected only in 12 genotypes, namely Iqbal 2000, NR-281, NR 354, NR 363, NR 364, NR 366, NR 367, NR 370, NR 376, 4^{th}EBWYT 509, 4^{th}EBWYT 510 and 4^{th}EBWYT 518.

Eleven genotypes showing the amplified *Lr34/Yr18*-linked allele were further studied for the assessment of the effect of *Lr34/Yr18* on components of partial resistance along with nine genotypes lacking this gene complex. Both stripe and leaf rusts were studied separately. The components of partial resistance including latency period (LP) and infection frequency (IF) were studied on primary leaf (seedling stage), fourth leaf and fully expanded young flag leaf (adult plant stage). Both the stripe and leaf rust fungi showed a prolonged LP and reduced IF on genotypes carrying *Lr34/Yr18* gene complex. Generally, a longer LP was associated with a reduced IF at all growth stages. Although significant effect of *Lr34/Yr18* gene complex on LP and IF was observed almost at all three growth stages, the effect was more pronounced at flag leaf. This suggested that *Lr34/Yr18* gene complex is more effective at later stages of plant growth. [Maqsood Qamar, Dilnawaz Ahmed Gardezind and Muhammad Iqbal (Pakistan). Journal of Phytopathology, 160(11-12): 628-636, 2012].

Effects of combined thiamethoxam and diatomaceous earth on mortality and progeny production of four Pakistani populations of *Rhyzopertha dominica* (Coleoptera: Bostrichidae) on wheat, rice and maize. Bioassays were conducted to evaluate the effects of combining thiamethoxam at 0.25, 0.5 and 0.75 mg/kg of active ingredient with the diatomaceous earth (DE) formulation, SilicoSec, at the rate of 100 mg/kg against four Pakistan populations of the lesser grain borer, *Rhyzopertha dominica* (F.) (Coleoptera: Bostrichidae). The tests were carried out with adult beetles on wheat, maize, and rice. Mortality increased with increasing application rates and exposure intervals for each population. Individually, thiamethoxam alone was more effective at the high dose rate than DE alone, but after 14 days of exposure in most cases, there was greater mortality with DE than with the low dose of thiamethoxam. There was greater mortality in wheat than in rice or maize. Populations differed in susceptibility to treatments and production of progeny. [Waqas Wakil, Tahira Riasat and Jeffrey C. Lord (Pakistan and USA). Journal of Stored Products Research, 52: 28–35, 2013]

SAUDI ARABIA

Morphological and molecular characterization of cereal cyst nematode (*Heterodera avenae*) populations from arid environments. The morphological and molecular characteristics of four cereal cyst nematode (*Heterodera avenae*) populations collected from the Qassim, Tabouk, Riyadh, and Hail regions, Saudi Arabia were comparatively investigated. A large number of soil samples were collected from a representative field (72 ha) in each region. The morphological and morphometric characteristics of the populations were determined. Morphometric data were subjected to multivariate canonical discriminant analysis to analyze the relationship between the studied populations and to identify the variables that show the highest multiple correlations with these populations. For molecular characterization, DNA was extracted and purified from five random white females from each population. The internal transcribed spacer (ITS1) regions were subjected to direct sequencing to study the diversity of these populations. Discriminant analysis of the morphometric traits indicated that the studied populations belong to one species (*H. avenae*). The ITS1 sequence alignments showed similarity between individuals, ranging from 87 to 99%. Based on the sequencing data, consensus parsimonious and maximum likelihood trees showed an overlap between the individuals of the four populations, suggesting that all four populations represented one species. However, based on the morphological and molecular analysis, the Hail population was somewhat different from the other three populations. Minor genetic and phenotypic differences between the four populations could indicate that these populations are heterogenic, probably mixed populations. This study also revealed the value of some J_2 morphometric traits such as J_2 midbody width, J_2 body width at the anus, J_2 head height and the J_2 ratios a, b, c and c′ in determining intraspecific variation between *H. avenae* populations. [Ahmed A.M. Dawabah, Ahmad S. Al-Hazmi, Soloiman M. Al-Rehiayani, Ahmed L. Abdel-Mawgood, Mohamed I. Motawei, Soleman Al-Otayk, Monther T. Sadder, Abdallah M. Elgorban, Hussein M. Migdadi, Khaled A. Moustafa and Abdullah A. Al-Doss (Saudi Arabia). Australian Journal of Crop Science, 6: 970-979, 2012].

SYRIA

Viruses and Hop Stunt Viroid of Fig Trees in Syria. A virus survey was carried out in spring and summer 2010 in Syrian fig orchards and gardens in 9 cities and in a varietal collection at Idleb. A total of 90 fig samples were collected and tested by RT-PCR for the presence of Fig leaf mottle-associated virus 1 (FLMaV-1), Fig leaf mottle-associated virus 2 (FLMaV-2), Fig mild mottle associated virus (FMMaV), Fig mosaic virus (FMV), Fig latent virus 1 (FLV-1), Fig cryptic virus (FCV), Fig fleck-associated virus (FFkaV), and Hop stunt viroid (HSVd) using sets of specific primers. PCR results showed that about 84% of the trees were infected with at least one virus. FMV was the prevailing virus (56.7%), followed by FFkaV (36.7%), FLMaV-2 (31.1%), FMMaV (12.2%), FLV-1 (11.1%) and FLMaV-1 (4.4%), whereas FCV was not found. HSVd was detected in 13.3% of the samples. In a phylogenetic tree, the nucleotide sequences of most Syrian HSVd-fig isolates grouped with those reported in Lebanon from the same host and from mulberry, forming a distinct clade (M-group). This is the first report of FMMaV, FMV, FLV-1 and HSVd in fig trees

in Syria. [T. Elbeaino, R. Abou Kubaa, F. Ismaeil, J. Mando, M. Digiaro, (Syria). Journal of Plant Pathology, 94(3): 687-691, 2012].

TUNISIA

Pathogenicity Spectra and Screening for Resistance in Barley against Tunisian *Pyrenophora teres* f. *teres*. This work aimed to determine patterns of pathogenicity in *Pyrenophora teres* f. *teres* and to identify potentially effective resistance sources that could be used as breeding material to control net blotch in Tunisia. Extensive pathogenic variability was detected in 85 isolates of *P. teres* causing net blotch of barley in Tunisia. Based on unweighted pair-group method with arithmetic averaging clustering and mean disease rating scores, three distinct virulence groups were identified. The isolates were classified into 23 pathotypes. Pathogenic variability within the groups was higher than that between the groups, a finding that can guide a rational choice of isolates for screening lines as part of a breeding program. Conversely, studying the relationship between geographic and pathotypic structure allowed us to detect a significant isolation by distance pattern, suggesting a regular and gradual dispersal of the pathogen over this spatial scale. Using specific resistance properties of individual barley genotypes as virulence markers, all the differential barley genotypes were shown to be distinct, and no single source of resistance was totally effective against all isolates. [A. Bouajila, N. Zoghlami, M. Al Ahmed, M. Baum, A. Ghorbel and K. Nazari (Tunisia & ICARDA-Syria). Plant Disease, 96(10):1569-1575, 2012].

TURKEY

Insecticidal activity of *Hypnum cupressiforme* (Bryophyta) against *Sitophilus granarius* (Coleoptera: Curculionidae). The moss *Hypnum cupressiforme* Hedw. is cosmopolitan throughout the world and is one of the most common moss species in Turkey. In the autumn of 2011, moss samples were collected from Şadıman Hill located in Ilgaz Mountain National Park in Turkey. After drying the collected samples at room temperature, the green gametophytes and brownish rhizoid parts of the plant were separated from other contents and ground up before extraction procedure. The contact toxicities of 14 column fractions and 11 flash fractions of *H. cupressiforme* were evaluated against granary weevil (*Sitophilus granarius*) adults. The fractions C-10 (70.62%) obtained from column chromatography and F-11 (64.48%) obtained from flash chromatography showed the highest activity. As a result of dose dependent studies carried out on C-10 and F-11, LC_{50} values were calculated as 44.8 µg/µl and 45.3 µg/µl, respectively. Two other fractions C-3 (29.9%) and F-2 (32.1%) were determined to have an active substance different from fractions C-10 and F-11. The LC_{50} values of fractions C-3 and F-2 were determined as 81.3 µg/µl and 124.6 µg/µl, respectively. [Gökhan Abay, Ömer Cem Karakoç, Ali Rıza Tüfekçi, Serkan Koldaş and Ibrahim Demirtas (Turkey). Journal of Stored Products Research, 51: 6-10, 2012].

A novel *Bacillus thuringiensis* strain and its pathogenicity against three important pest insects. A highly pathogenic *Bacillus thuringiensis* (*Bt*) strain was isolated from a soil sample in Turkey and characterized in terms of both its 16S-ITS rDNA region and *cry* gene content. This strain (SY49.1) harboured several *cry* genes producing crystalline inclusions known to have toxicity on lepidopteran, dipteran and coleopteran pests. The 16S-ITS sequence analysis of *Bt* SY49.1 showed 98% similarity to *Bt* serovar *andalousiensis* BGSC 4AW1. The larvae of *Ephestia kuehniella* and *Plodia interpunctella* were treated with a spore-crystal mixture of this strain in the dose range of 50–1000 µg g^{-1}. Mortality rates were higher than 90% at the highest concentration for these pests. For *Tribolium castaneum* much higher concentrations were needed than with lepidopteran pests larvae. At the highest concentration tested of 10 mg g^{-1}, about 62% mortality was obtained. It was concluded that this native strain of *Bt* could be used as an effective biocontrol agent against various lepidopteran pests. [Semih Yılmaz, Abdurrahman Ayvaz, Mikail Akbulut, Ugur Azizoglu and Salih Karabörklü (Turkey). Journal of Stored Products Research, 51: 33-40, 2012].

The distribution of Russian Wheat Aphid, *Diuraphis noxia* (Kurdjumov) (Hemiptera: Aphididae) in Turkey. The Russian wheat aphid, *Diuraphis noxia* (Kurdjumov) (Hemiptera: Aphididae), is one of the most economically important and widely distributed pests of wheat in the world. In 1962, *D. noxia* caused crop losses between 25 and 60% in the central province of Konya, Turkey. In this study, the current status of the pest in wheat-producing areas of Turkey was investigated along a route from Izmir to Manisa, Usak, Kutahya, Eskisehir, Aksehir, Ankara, Konya, Aksaray, Nevsehir, Yozgat and Erzurum. *D. noxia* was detected in 58 of the 100 wheat fields surveyed in most fields and wheat was at the heading stage. The population density of the pest was low in 23 fields, medium in 22 fields and high in 13 fields. The percentage of infestation was low in 31 fields, medium in 12 fields, and high in three fields and very high in three fields. *D. noxia* was collected from bread or durum wheat plants (71%), barley plants (10%), volunteer oats (8%) (*Avena fatua*), volunteer wheat (6%), false barley (*Hordeum murinum*) (4%) and natural grasses (1%). According to results of the study, population density, damage and infestation rates of *D. noxia* were higher in high altitudes. [Ferit Turanli, Astrid Jankielsohn, Alexey Morgounov and Mehmet Cakir (Turkey). African Journal of Agricultural Research, 7(39): 5396-5404, 2012].

❖Some Plant Protection Activities of FAO and Other Organizations

DESERT LOCUST SITUATION

Situation level: Threat

General Situation of the Desert Locust during November 2012 Forecast until mid-January 2013.

Provided by the FAO Emergency Center for Desert Locust (ECLO).

The Desert Locust situation remained serious during November as small swarms formed in Mali, Niger, and Chad, and adult groups moved north to Libya, Tunisia and Algeria. An increasing number of adults were seen in Morocco and the Western Sahara. Locusts formed groups and small hopper bands in western Mauritania. More groups and small swarms are likely to form in the Sahel during December and move to Northwest Africa and northwest Mauritania. In the Central Region, groups and swarms formed in northern Sudan and moved to Egypt and the Red Sea coast where winter breeding will occur during the forecast period. One group crossed the sea to the Saudi Arabian coast. Aerial control operations commenced in Algeria, Niger and Sudan. Control operations were also undertaken in Mauritania, Libya, Chad and Egypt. All efforts are required to monitor the situation and undertake the necessary control operations.

Western Region. Second generation breeding continued to cause locust numbers to increase in the northern Sahel of Mali, Niger and Chad during November. As vegetation dried out, hoppers and adults formed groups and a few hopper bands and small swarms. Small adult groups moved north into southeastern and western Libya, southern Tunisia, and Algeria. In Mauritania, locust infestations increased in the west and northwest due to breeding and the arrival of adults from the summer breeding areas in the south, causing hopper and adult groups to form as well as a few hopper bands. Aerial control operations commenced in Niger and Algeria, supplementing ground efforts. Ground control was also carried out in Chad and Mauritania. During the forecast period, more groups and swarms will form in the northern Sahel and move into Northwest Africa where breeding could occur if temperatures remain warm. Breeding will continue in northwest Mauritania, causing locusts to increase further.

Central Region. Hopper and adult groups, bands and swarms continued to form during November in the summer breeding areas in the interior of Sudan. Although ground and aerial control operations were undertaken, groups of adults moved north to southern Egypt while other groups and small swarms migrated to the winter breeding areas in northeast Sudan and on the Red Sea coast in southeast Egypt. At least one group crossed the Red Sea to the northern coastal plains in Saudi Arabia. During the forecast period, small to moderate scale breeding will cause locust numbers to increase along both sides of the Red Sea as hatching commences in December.

Eastern Region. Isolated adults persisted in a few places of the summer breeding areas in Rajasthan, India near the border with Pakistan. No significant developments are likely.

For more up to date information about the Desert Locust situation and forecasts, visit the FAO's Desert Locust website:

http://www.fao.org/ag/locusts/en/info/info/index.html

Source: The FAO Desert Locust Bulletin issued monthly in English and French by the Desert Locust Information Service, AGP Division (Rome, Italy; and Arabic version by the Commission for Controlling the Desert Locust in the Central Region (FAO Regional Office for Near East, Cairo, Egypt http://crc-empres.org).

ANNUAL REGIONAL WORKSHOP FOR THE REVIEW OF DRAFT INTERNATIONAL STANDARDS FOR PHYTOSANITARY MEASURES (ISPMS)

The Annual Regional Workshop for the Review of Draft International Standards for Phytosanitary Measures was convened in Cairo, Egypt during the period 9-13 September, 2012. The workshop was organized by the FAO Regional Office for the Near East (RNE) with support of the International Plant Protection Convention (IPPC). The objective of the workshop was to review the new draft standards approved by the Standard's Committee this year 2012, provide comments on reviewed standards and agreed upon regional comments that should be considered before the adoption of the draft standards by the Commission for Phytosanitary Measures (CPM). The workshop aimed as well at promoting discussion and information exchange between countries in the region on the current phytosanitary system of each country, national plant protection issues and challenges faced countries. Furthermore, the workshop intended to prioritize and identify the challenges and support needed to face the challenges of the countries of the region.

The meeting was attended by 24 participants representing 14 countries in addition to the Near East Plant protection Organization (NEPPO) Executive Secretary.

The new draft standards discussed were:

1. Draft Appendix 1 to ISPM 12:2011 *Electronic certification, information on standard xml schemas and exchange mechanisms* (2006-003)
2. Draft ISPM on *Determination of host status of fruits and vegetables to fruit fly (Tephritidae) infestation* (2006-031)
3. Draft ISPM on *Establishment of fruit fly quarantine areas within a pest free area in the event of an outbreak (for inclusion as Annex 1 of ISPM 26) (2009-007)*
4. Draft Annex to ISPM 27:2006: *Guignardia citricarpa* Kiely on fruits (2004-023)
5. Draft Annex to ISPM 27:2006 - *Tilletia indica* Mitra (2004-014)

REGIONAL WORKSHOP ON "STRENGTHENING REGIONAL COOPERATION AND KNOWLEDGE SHARING IN PLANT PROTECTION BETWEEN THE NEAR EAST COUNTRIES"

The Regional Office of the Food and Agriculture Organization (FAO) for the Near East region in collaboration with the Plant Protection Research Institute of Agricultural Research Center, MoA organized a regional workshop on " Strengthening Regional Cooperation and Knowledge Sharing in Plant Protection between the Near East Countries" in Cairo, Egypt, during 2-4 Dec. 2012.

The workshop aimed at boosting the role of the Near East Plant Protection Network (NEPP-NET) in developing knowledge and information sharing mechanism, and strengthening the communication and cooperation between countries in plant protection issues, for effective contribution to the rural and agricultural development and improvement of the food security in the countries in the region.

Around 25 plant protection professionals from 17 countries in the region attended the workshop. The participants have been trained on data management and information and knowledge exchange in the fields of integrated pest management (IPM)n and phytosanitary and pesticide management. During the workshop, the plant protection profiles of the participating countries were presented.

The Near East Plant Protection Network (NEPP-NET) is a web-based integrated, multilingual regional thematic information and communication system. It enables plant protection specialists to capture and disseminate information and knowledge about plant protection institutes, specialists including researchers working in those institutes, publications issued by those specialists, completed or currently active projects, and good practices and successful stories for knowledge management on plant protection research and activities in National Agricultural Systems.

Network website:

http://pp-neareast.net/Pages/Index.aspx?CMSId=8

REGIONAL SYMPOSIUM ON THE MANAGEMENT OF FRUIT FLIES IN NEAR EAST COUNTRIES HAMMAMET – TUNISIA 6-8 NOVEMBER 2012

The Regional Symposium on the Management of Fruit Flies in Near East Countries was organized jointly by FAO, FAO-IAEA, NEPPO, IOBC North Africa Commission, the DG Plant Protection in Tunisia and the Tunisian Association of Plant Protection (ATPP), from 6 to 8 November 2012.

The symposium provided a common forum for researchers, phytosanitary regulatory, plant protection experts, fruit producers and crop protection industry to share their knowledge on fruit flies' biology, phytosanitary measures, monitoring, management and identify gaps in knowledge, capacity building needed; and measures should be taken to prevent the

introduction of new species into the Near East region; and to come up with a IPM fruit flies strategies to respond to the outbreaks in the region. The symposium was also a good occasion to share and benefit from the knowledge and information on the integrated management (IPM) of fruit flies in the Mediterranean region and different parts of the world.

Around 100 participants took part in the symposium, coming from 23 countries in the Middle East, North Africa, Europe, Africa, and Asia.

A field trip was organized to observe citrus production as well as the production of natural enemies of the pest in the Technical Centre of Citrus in Cap Bon-Tunisia.

TECHNICAL SEMINAR ON MONITORING AND MANAGEMENT OF THE TOMATO BORER, *TUTA ABSOLUTA*, SANAÁ, YEMEN

The FAO Regional Office for the Near East in cooperation with the General Directorate of Plant Protection (GDPP) in the Ministry of Agriculture and Irrigation in Yemen convened a national technical seminar on monitoring and management of Tomato Borer (*Tuta absoluta*) in Sanaá, Yemen, on December 11, 2012.

Around 75 specialists from the GDPP and Plant Protection Directorate in the regions, Agricultural Research Authority, Extension Service, farmers and other stakeholders participated in the seminar.

The purpose of the seminar was to raise the awareness among the stakeholders about the new invasive pests and to strengthen the capacity of the specialists in early detection, monitoring and management measures. A number of traps with the pheromones were distributed to the farmers and technicians from different tomato growing areas for monitoring purpose.

❖Short plant protection notes

- Based on research and observation, exotic pathogens are said to be a safe and useful tool for weed control, especially in natural areas rich in valued non-target species.- J. Barton, Jane.Barton@ihug.co.nz.
- Climate change is already being blamed for increasing multiple pest outbreaks in Manihot esculenta (cassava) across South-east Asia, according to a recent report. See: http://tinyurl.com/9p6t4rh.
- Trial results for using entomopathogens in soil-less media in greenhouse and nursery production found that using peat moss, recycled plant material, or hardwood bark produced optimum impacts. - A.L. Nielsen, Nielsen@aesop.rutgers.edu.
- Field appraisals and individual interviews conducted in western KENYA revealed that farmers viewed Striga hermonthica (witchweed) as a major constraint to cropping, but also rejected control methods as too risky with no guaranty of direct crop yield increase. - K. Itoh, KItoh@people.kobe-u.ac.jp.
- The world's main pesticide manufacturing/marketing firms "continue to invest in biopesticides," according to a report in the 30 September 2012 issue of Crop Protection Monthly at www.crop-protection-monthly.co.uk.
- A conceptual framework, based on a pesticide impact assessment plus a multi-question farm inquiry, was used as a dual approach to aid growers in achieving more sustainable crop protection. - H. Wustenberghs, Hilde.Wustenberghs@ilvo.vlaanderen.be

❖GENERAL NEWS

WHITEFLY RESISTANT GENE FOUND IN GALÁPAGOS TOMATO

Scientists from Wageningen University in the Netherlands, together with its partners, have identified the genes for whitefly resistance in a wild relative of cultivated tomato known as the Galápagos tomato. Whitefly causes major damage to the plant and its fruit, and is an important vector of plant virus dissemination.

Scientists tested different seeds of crossable varieties of tomato from various gene banks and measured their resistance to whitefly. The 30 varieties underwent whitefly infestation and were observed for the number of eggs laid to them over five days. The said process revealed one crossable variety fully resistant to the whitefly – a wild tomato from the Galápagos Islands. The scientists then identified two resistance genes in the wild tomato using DNA research.
With this discovery, a plant breeding company hopes to introduce these genes into cultivated tomatoes and bring a resistant tomato to market within two years.

See the original article at http://www.wur.nl/UK/newsagenda/news/gal%C3%A1pagostomato12092012.htm.

PLANTS HAVE MECHANISM TO SEEK FOR HELP WHEN SENSING INSECTS' ATTACK, RESEARCH SAYS

Scientists from Wageningen University and the Netherlands Institute of Ecology (NIOO-KNAW) have completed a research study on the mechanism of plants to seek for help once insect pests' eggs were deposited on them which is the initial phase of the herbivore attack.

The research team investigated how parasitic wasps, natural enemies of a common cabbage pest; the large cabbage white butterfly; and gravid butterfly females respond to the black mustard, a cabbage relative, once it emits odor as the eggs are laid on its leaves. The study reveals that butterfly egg deposition triggers highly specific chemical and structural changes in the plant that attract different parasitic wasps attacking either butterfly eggs or caterpillars but repel egg-laying butterflies. See the full journal article at http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0043607

NEW GENE COULD LEAD TO BETTER BUG-RESISTANT PLANTS

Trichomes in wild tomatoes were found to produce acyl compounds that could be used in fending-off insect attack. This finding was discovered by a team of scientists in Michigan State University led by Anthony Schilmiller and Robert Last. Genes that are involved in the acyl production were discovered and identified. The location of the trichomes and its accompanying secreted acyl compound becomes the first line of defense in insect attack.

Cultivated tomatoes no longer contain these trichomes, hence resistance to insects is lowered. The discovery which was published in the online edition of the Proceedings of the National Academy of Sciences describes the first gene that partipates in the production of the protective sugars in cultivated tomatoes. The gene is only active in one specific cell of one trichome type. This discovery and immediate transfer of the gene to cultivated tomates as well as other solanaceous crops such as potatoes, peppers, eggplants and petunias would provide another strategy in fighting insects.
Full Article can be downloaded at http://news.msu.edu/story/new-gene-could-lead-to-better-bug-resistant-plants/

FREE IPM INFORMATION AVAILABLE ONLINE

1. The latest issue of the **Journal of Integrated Pest Mgmt.** is vol. 3, no. 3, 2012, containing four papers. The periodical, published by the Entomological Society of America, is freely available online at http://tinyurl.com/8j6tm3m (IPMnet NEWS, November 2012).
2. The September 2012 issue of **Retail Nursery and Garden Center IPM**, a quarterly published by the Univ. of California, can be accessed at www.ipm.ucdavis.edu/retail/.(IPMnet NEWS, November 2012).
3. The Indian National Centre for Integrated Pest Management has published **Innovative Approach in Sustainable Production of Pigeonpea & Chickpea, Success Story of Gul-barga**, a 64-page report that emphasizes crop protection. Authors O.P. Sharma, *et al*, chronicle the introduction and adoption of IPM at the village level in a pulse-growing region of INDIA under the ongoing Accelerated Pulses Production Programme (A3P). In his foreword to this 2012 document, FAO Representative in India P.E. Kenmore cites the goal of sustainability and notes a significant reduction in sprayed insecticides, a decrease in dust insecticides, and an increase in the application of biopesticides

that all contribute to higher net profits to growers. -> NCIPM, LBS Bldg., IARI Campus, New Delhi 110 012, INDIA. www.ncipm.org.in. (IPMnet NEWS, November 2012).

4. The **Bulletin of Insectology** publishes "original articles, mainly on morphology, biology, behavior, and physiology of insects and other arthropods; control of insects, mites and other arthropod pests with particular reference to biocontrol and integrated pest management." Abstracts are freely accessible. www.bulletinofinsectology.org. (IPMnet NEWS, November 2012)
5. Crop protection-related U.S. Agricultural Research Service articles appearing in recent issues of **Agricultural Research**, at www.ars.usda.gov/is/pr/, in either html or pdf form, include:

"Hormone Therapy for Fruit Flies Means Better Pest Control," 04 September 2012;

"Researchers Use 'Banker Plants" to Help Battle Whitefly Pests," 10 September 2012;

"Trapping Weevils and Saving Monarchs," 01 October 2012;

"ARS Scientists Devising New Ways to Protect Avocados," 03 October 2012;

"Rearing Technique May Bolster Biocontrol Wasp's Commercial Prospects," 09 October 2012. (IPMnet NEWS, November 2012)

Preventing and Managing Pesticide Resistance

The latest addition to the **International Code of Conduct on the Distribution and Use of Pesticides** promulgated by the FAO, is **Guidelines on Prevention and Management of Pesticide Resistance**, published in September 2012. Resistance (technical) is defined as "a genetic change in an organism in response to selection by pesticides, which may impair control in the field." Practically resistance may also be seen as "a heritable change in the sensitivity of a pest population that is reflected in the repeated failure (more than one instance) of a product to achieve the expected level of control." Several forms of resistance (metabolic, multiple, penetration) are defined and discussed. As expected from an FAO document, the resistance element referred to addresses the realm of agriculture and focuses on the problem associated with pesticides. The 57-page publication, freely available at http://tinyurl.com/9frwaxo, outlines resistance problems and their causes, and identifies the objectives and challenges associated with managing pesticide resistance (IPM Net, November 2012).

Worst Fungus Among us

The world's Top 10 Fungal Pathogens, as nominated by fungal pathologists and compiled by R. Dean, *et al*, are, in order: (1) *Magnaporthe oryzae*; (2) *Botrytis cinerea*; (3) *Puccinia* spp.; (4) *Fusarium graminearum*; (5) *Fusarium oxysporum*; (6) *Blumeria graminis*; (7) *Mycosphaerella graminicola*; (8) *Colletotrichum* spp.; (9) *Ustilago maydis*; (10) *Melampsora lini*, with honorable mentions for fungi just missing out on the Top 10, including *Phakopsora pachyrhizi* and *Rhizoctonia solani*. The list was published in **Molecular Plant Pathology**, 13(4), 414-430, May 2012, at http://tinyurl.com/9s5rsz2. The listing includes a short resume of each ranked fungus as well as its importance (IPM Net, November 2012).

Crop Protection Videos

Several U.S. land grant universities offer a selection of **videos related to crop protection.** The Integrated Pest and Crop Management program at the Univ. of Wisconsin lists six recent videos such as "Spider Mites in Soybean," and "Alfalfa Weevil Scouting in Alfalfa Fields," that can be freely accessed at www.ipcm.wisc.edu. Extension specialists at Purdue Univ. have also produced a number of videos including "Aspergillus Ear Rot, Identification and Scouting Tips," and another discussing options for growers in controlling the weed *Chenopodium album* (lambsquarters). These and other videos can be freely accessed at www.youtube.com/watch?v=YP9rLFtrtCM(IPM Net, November 2012).

(ISPP) New Job Vacancy, Plant Pathologist (Aflatoxin Biocontrol)

Background: The International Institute of Tropical Agriculture (IITA) invites applications for the position of a **Plant Pathologist (Aflatoxin Biocontrol)**.
Please visit http://www.iita.org/ for more information on IITA.
Position/Responsibilities: The primary responsibilities of the Plant Pathologist (Aflatoxin Biocontrol) is to: work with other team members for developing, testing and commercializing aflatoxin biocontrol products in maize and groundnuts for improving health and income of people in Southern Africa. The successful candidate will become a member of a team that is developing an Africa-wide aflatoxin biocontrol program (for more details see: www.aflasafe.com).
Educational Qualifications: The candidate must have a PhD degree in plant pathology or related field.
Duty Station: IITA-Zambia, Lusaka.
General Information: Initial appointment is for three years. IITA offers a competitive remuneration package paid in US dollars.
Applications: Applications including covering letter, curriculum vitae, names and addresses of three referees should be addressed to the Human Resources Manager. Please complete our online application form using this link: http://www.iita.org/irs-online-application
Closing Date: 3rd January 2013

❖ Arab Society for Plant Protection News

The Arab Society of Plant Protection becomes an affiliate member of IAPPS

The International Association for the Plant Protection Sciences (IAPPS) is a global forum of scientists providing information and policy advice on sustainable health management practices, to insure production of sufficient quality of food/feed/fiber for a growing world population. Plant protection societies from over 60 countries around the world are affiliated with IAPPS. The Arab Society of Plant Protection (ASPP) became an affiliate member of IAPPS as of November 1, 2012. This membership will open avenues of interaction with similar societies at the international scene, which will prove beneficial to all plant protection scientists in the Arab countries.

The Arab Journal of Plant Protection will become available only online starting 2013

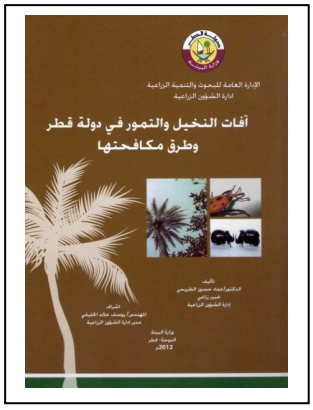
The Executive Committee of the Arab Society of Plant Protection, following a discussion on the high cost of printing and mailing the Arab Journal of Plant Protection, decided to move to electronic online publishing of the journal starting in 2013. This means that the last paper version of the journal will be the coming December 2012 issue. At the same time and because of cutting down the cost of printing and distribution, it was decided to publish three issues of the journal in 2013 and hopefully four issues in 2014 and thereafter instead of two issues per year at the present time. The positive result of such a change is that the waiting period for authors from the moment the article is accepted until it is published will be shorter. In 2013, a user name and a password will be distributed to all society members who paid their subscription fees.

❖ Publications

New Books

Pests of Date Palm and Dates in Qatar and Control Methods

Author: Emad Hussain Al-Turaihi
Supervision: Yousef Khaled Al-Kulaifi
Price: Free



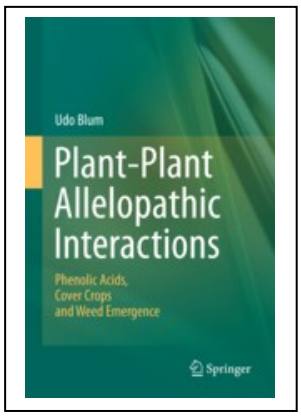
A new book on pests of date palm and dates in Qatar has been published by the Directorate General for Agricultural Research and Development, Ministry of Environment. The content of the book comprises seven chapters; the first one is a general introduction on the history of date palm in the Islamic and Arab countries. It also mentioned the most popular varieties which are currently cultivated in the world, in addition to that the area of plantation and the international production of dates. The second chapter mentioned the impact of environmental factors on the plantation of date palm and production of dates such as temperature, irrigation system, humidity, rainfalls, sunlight, salinity of water and soil. The third chapter mentioned the importance of date palm tree in Qatar. It also mentioned the area of plantation, local varieties, production of dates, number of palm trees and the traditional practices. The fourth chapter is a crucial chapter of the book which described in details the most important harmful insects and diseases of date palm and dates in Qatar such as red palm weevil, fruit stalk borer, long-horned stem borer, mealy bugs, scales, Dubas, Cicada, greater and lesser date moths. Besides that, it described the fungal and physiological diseases such as inflorescence rot, black scorch, Grapholia leaf spot, Diplodia disease, leaf spot, fruit rot, Albinism, fruit shrivel, checking phenomena, V-cuts and head bending. The fifth chapter described in brief the pests which are not yet recorded in Qatar. These pests are Bayoud,

brittle leaf, Al Wajam, lethal yellowing, Khapra beetle, and large palm moth. The sixth chapter gave general idea about the impact of agricultural practices on the infestation/ development of insects/ diseases of date palm such as using manure, fertilizers, inter-cropping, space of plantation, pruning, plowing, pollination …etc. The seventh chapter is the last one in the book which stated the integrated management of date palm pests by using tissue culture technique, plant extracts, pheromone traps, light traps, organic culture, mechanical control, microwaves, acoustic devices, biological agents, resistant varieties, plant quarantine and finally synthetic chemical pesticides. (The book contains 240 A4 pages with 158 color illustrations).

Plant-Plant Allelopathic Interactions

Phenolic Acids, Cover Crops and Weed Emergence

Authors: Udo BLUM



In an effort to implement conservation measures farmers have used a variety of production methods including reduced or zero tillage. With the implementation of these methods there has been an increase in the use of small grain and legume cover crops and their residues. One benefit of these production methods has been early season weed control. Presently the most promising cover crops and their residues for annual broadleaf weed control in temperate regions of the world are the small grains such as wheat and rye. The literature suggests that a variety of mechanisms are involved in regulating weed seedling emergence, among them the allelopathic effects of phenolic acids.

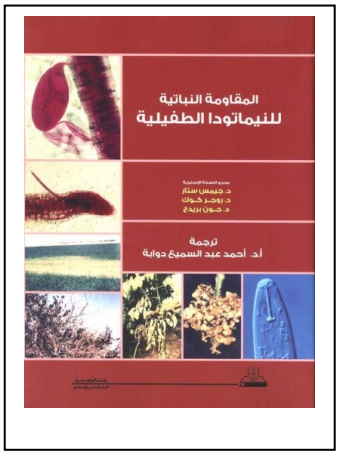
This book addresses the following questions: How likely are the necessary phenolic acid concentrations and environmental conditions present in wheat no-till cropping systems for inhibition of annual broadleaf weed seedling emergence? and Do phenolic acids have a dominant role in regulating annual broadleaf weed seedling emergence or are phenolic acids just one component of a larger promoter/modifier/inhibitor complex in wheat no-till cropping systems? The book has four chapters covering: 1. allelopathic plant-plant interactions, 2. laboratory experiments, 3. field and associated laboratory experiments, and 4. conclusions and suggested future research. There are several things that are unique about this book: a. The format is that of a research paper published in scientific journals. b. It differs from the journal format in that logic, reasons, and justifications for various procedures are provided. c. The Scientific Method and its approach to research are emphasized. For example, if-then hypotheses and cons and pros are provided so that readers can draw their own conclusions. and d. Although a broad range of literature is included, this book is a retrospective analysis of some 20 plus years of research on plant-plant allelopathic interactions at North Carolina State University.

Plant Resistance to Parasitic Nematodes

Editors: J.L. Starr, R. Cook and J. Bridge

Translated By: Prof. Ahmed A. Dawabah

Price: 86 SR



A new book has been published recently by the General Directorate for Academic Publishing and Press, King Saud University, Riyadh, Saudi Arabia. The book is an Arabic translation by Professor Ahmed Abdel-Samie Dawabah for the book entitled "Plant Resistance to Parasitic Nematodes", which has been edited by: J.L. Starr, R. Cook, and J. Bridge, and published in 2002 by CABI Publishing. The book comprises 12 chapters plus a subject index and a terminology section. The first chapter is an introductory to the history, current use and future potential of plant resistance to parasitic nematodes. The second chapter explains the concepts and consequences of resistance. Chapters from 3 to 11 included brief information about the biology of the most important plant parasitic nematodes worldwide, in addition to the explanation of the definition, evaluation, and inheritance of plant resistance to parasitic nematodes in the economic crops. Besides, these chapters shed the light on how to incorporate resistance to nematodes in the economic crops either by the traditional breeding methods or by molecular techniques. Finally, chapter 12 discussed the marker assisted selection for soybean cyst nematodes. The book contains 378 A4 pages of the luxury paper with two color plates.

SELECTED RESEARCH PAPERS

PAPERS WHICH WILL BE PUBLISHED IN ARAB JOURNAL OF PLANT PROTECTION, VOLUME 30, ISSUE 2, DECEMBER 2012

Isolation and identification of *Colletotrichum coccodes,* the causal pathogen of black dot disease on potato in Syria. 2012**.** Matar, M.

Distribution of life stages of Leopard moth *Zeuzera pyrina* L. in apple orchards in Lattakia Governorate, Syria. 2012. Bashir, A.M., L.H. Aslan and J.A. Ibrahim.

Suitability of Five Prey Aphid Species for Development, Fecundity and Survival of the Predators *Coccinella septempunctata* (L.) and *Harmonia axyridis* (Pallas) Under Laboratory Conditions. 2012. Shahadi, F., M. El-Bouhssini, M. Abdulhai and B.P. Parker.

Preliminary study to determine damage and intensity of injury caused by sugar beet flea beetles (Coleoptera: Chrysomelidae) in some sugar beet fields in Homs province in Syria. 2012. Bashir, A.M., L. Darwish and Z. Shekh-Khamis.

Threat of the red palm weevil, *Rhynchophorus ferrugineus* (Olivier) to date palm plantations of the Maghreb region in North Africa. 2012. Faleiro, J.R., A. Ben Abdallah, M. El-Bellaj, A.M. Al Ajlan and A. Oihabi.

Identification of *Typhlodromus* (*Typhlodromus*) *athiasae* Porath and Swirski in Some Vineyards of Homs governorate, Syria. 2012. Barbar, Z., S. Al-Kushki and F. Al-Jamli.

Some biological characteristics of Sunn pest *Eurygaster integriceps* Puton in northern Syria. 2012. Abdulhai, M., G. Mustafa, M. El Bouhssini, M.N. Al Salti and A. Trissi.

Radiation sensitivity and induction of sexual sterility in irradiated cucurbit fruit fly *Dacus ciliatus* (Loew) pupae. 2012. Alrubeai, H.F., G.S.B. Yousif, B.A. Al-Azzawi and B.Sh. Hamad.

The influence of cabbage aphid density *Brevicoryne brassicae* (L.) on the numerical response of *Chrysoperlacarnea* (Stephens). 2012. Abdul Hay, H.S. and M.A. Al-Rawy.

Reaction of some tomato imported hybrids and local genotypes to infection with *Tomato mosaic virus* and its molecular detection. 2012. Ismaeil, F., A.A. Haj Kasem and S. Al-Chaabi.

A study on the effect of some cultural practices and insecticides in integrated management of *Barley yellow dwarf virus* infecting barley. 2012. Ansi, A., S.G. Kumari, A.A. Haj Kassem, K.M. Makkouk and I. Muharram.

Epidemic incidence of yellow rust disease on bread wheat in Syria during 2010 season, performance of released and promising varieties, and preliminary identification of effective resistant genes to pathogen virulences. 2012. Al-Chaabi, S. and T. Abu-Fadel.

Distribution and effectiveness of *Phytomyza orobanchia* Kalt. in tomato fields infested with *Orobanche ramosa* L. along the coastal region of Syria. 2012. Habak, H., M. Ahmad and B. El- Rahban.

Effects of mixed-pathotypes of *Didymella rabiei* on the development of Ascochyta blight on chickpea. 2012. Atik, O., A. El-Ahmed, M. Baum, S. Ahmed, M.M. Abang and M.M. Yabrak.

Categories of resistance of some Chickpea lines to chickpea leaf miner *Liriomyza cicerina* Rondani. 2012. Khoja, S., M. El Bouhssini, R. Malhotra, N. Kakha and M. Abdul Hai.

Survey of bacterial diseases on wheat and attendant weeds in Syria. 2012. Mando, H.M.H, M. Abu-Ghorrah and M.M. Yabrak.

Developing of new bread wheat cultivar "Farris" with high yield potential and resistance to yellow and brown rust diseases. 2012. Al-Maaroof, E.M., K.K. Abbas, F.A. Fayad, A.A. Ismail, A.K. Hussein and A.R. Abbas.

Effect of Wheat Storage Methods in Syria on the Development of Black Point Disease. 2012. Al-Daher, A. and B. Bayaa.

❖ Events of interest

2013

*** 20-23 January**

Southern African Society of Plant Pathology conference 2013 at ATKV Buffelspoort, near Hartebeespoortdam, South Africa. Contact: SASPP Secretary Adel McLeod at e-mail: adelern@sun.ac.za

*** 28 January-1 February**

12th International Plant Virus Epidemiology (IPVE) Symposium in Arusha, Tanzania. See: www.iita.org/IPVE.

*** 18-22 February**

International Herbicide Resistance conference, Perth, Australia. Contact address: S. Powles, AHRI, School of Plant Biol., Univ. of Western Australia, 35 Stirling Hwy., Crawley, Perth 6009, WA, Australia. Email: Stephen.Powles@uwa.edu.au

*** 21-25 April**

17th International Reinhardsbrunn Symposium on Modern Fungicides and Antifungal Compounds in Friedrichroda, Germany. See: http://www.reinhardsbrunn-symposium.de

*** 22-26 April**

ISAA 2013 - 10th International Symposium on Adjuvants for Agrochemicals in Iguaçu Falls, Brazil. See: http://events.isaa-online.org/.

*** 26 April-3 May**

II International Symposium on Discovery and Development of Innovative Strategies for Postharvest Disease Management in Kusadasi, Izmir, Turkey. See: http://www.pdm2013.org

*** 28 July–2 August**

International Organisation of Citrus Virologists Conference 2013 in Kruger National Park, South Africa. Contact: Gerhard Pietersen at e-mail; gerhard.pietersen@up.ac.za

*** 25-30 August**

10th International Congress of Plant Pathology (ICPP2013), Beijing, China. Email: president@cspp.org.cn, http://www.icppbj2013.org/

*** 03-06 September**

2nd International Symposium on Plum Pox Virus (continuation of Middle European Meetings on Plum Pox Virus) in Olomouc, Czech Republic**.** See: http://isppv2013.upol.cz

*** 22-27 September 2013**

9th European Vertebrate Pest Management Conference. Turku, Finland. For more information please see: www.evpmc.org , or contact Otso Huitu Email: otso.huitu@melta.fi

*** 24-27 November**

19th Australasian Plant Pathology Society Conference in Auckland, New Zealand. See: http://www.australasianplantpathologysociety.org.au/

2014

*** 13-18 July**

Eight International Symposium on Chemical and Non-Chemical Soil and Substrate Disinfestation . Torino, Italy. www.sd2014.org

*** 27 July-1 August**

XIVth International Congress of Mycology, the XIVth International Congress of Bacteriology and Applied Microbiology and the XVIth International Congress of Virology in Montreal, Canada. See: http://www.montrealiums2014.org/; Contact: iums2014@nrc-cnrc.gc.ca

*** 03-08 August**

10th International Mycological Congress (IMC10). Bangkok, Thailand. Contact: Leka Manoch; e-mail: agrlkm@ku.ac.th

*** 09-13 August**

APS Annual Meeting in Minneapolis, Minnesota, USA. See: http://www.apsnet.org

*** 17–24 August**

29th International Horticultural Congress, "Horticulture - sustaining lives, livelihoods and landscapes", in Brisbane, Australia. See: www.ihc2014.org

2015

*** 24–27 August**

XVIII **IPPC (International Plant Protection Congress) in Berlin, Germany.** See: http://www.ippc2015.de

ACKNOWLEDGMENT

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