ARAB AND NEAR EAST PLANT PROTECTION NEWSLETTER

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CONTENTS

EDITORIAL

Crop and Food Biosecurity: a Luxury or a Need

Agriculture is essential to the social economic and political stability of all countries in the world. A disruption of agricultural activities should have widespread and dramatic economic consequences. Farming, in many Near East and North African (NENA) countries, employs 50% or more of the workforce in agriculture and the agro-food industry account for 10-70% of the NENA countries annual gross product, with production split, more-or-less, evenly between crops and livestock. Consequently, agriculture in the NENA countries must be prepared for any threat which could affect production.

Globally, bioterrorism events involving human health as the main target received so far the most attention. Crop bioterrorism is a new topic for the world, and fortunately until to date there are no acts of agroterrorism reported. The deliberate introduction of a pathogen could decrease crop/livestock yield and quality, increase the cost of disease management, and disrupt trade, markets, food prices and availability of certain foods. Such threat in now considered seriously in some countries around the world including the European Union and USA and there are at present a number of EU and NATO research projects to address these issues. Scientists in these countries developed a plan to enhance crop biosecurity and preparedness level. Projects are underway to establish a coalition of partners with the objective to: (i) develop a strong network of interconnected laboratories able to quickly diagnose new plant pathogens/races/biotypes and study their biology and epidemiology; (ii) prepare a list of pathogens considered high risk for European/USA crops, as well as a list of the most vulnerable crops; (iii) propose a risk assessment methodology for epidemics resulting from incidental events; (iv) provide effective tools and protocols for use by inspectors for quarantine and phytosanitary control; and (v) raise awareness of the issues of crop biosecurity and crop bioterrorism, to enhance preparedness in Europe and USA.

Should we in the NENA countries consider seriously this type of "anticipatory research", or we have so many other problems that force policy makers in our region to consider tackling such issues as a luxury and not a need!!?

Editorial Board

This page is an open forum for all members of the Arab Society for Plant Protection to express their views to further develop the plant protection profession and enhance its positive role in agricultural development in the Arab and Near East Region.

DISEASE AND PEST OUTBREAKS

ALGERIA

First Report of "Maladie des feuilles cassantes" (Brittle Leaf Disease) of Date Palm in Algeria. In December 2003 symptoms, identical to those of Maladie des feuilles cassantes (MFC), or brittle leaf disease, of date palms in Tunisia were observed in the Biskra region of eastern Algeria. In Lichana, where the disease started in 1974, 29% of the trees were found to be affected, while in Farfar some farms had 100% of trees with MFC. The disease affects groves in traditional oases, as well as new, industrial plantations in the Bouchagroun and Dra Elbetikh areas. All cv. Deglet Nour samples from five areas (Vieux Zaatcha, Bouchagroun, Dra Elbetikh, and Farfar) tested positive for the MFC-specific double-stranded RNA (dsRNA) of host origin, which is present in leaflets from all MFC-affected trees but not in those from healthy trees. The dsRNA is specific for MFC and is of diagnostic value, although not involved in the disease. All affected leaflets tested were also deficient in manganese (Mn; average 6.5 ppm dry weight, compared to 29 ppm for healthy leaves). MFC was first observed in the 1960s in the Nefta-Tozeur oases of Tunisia. Four to six years may elapse between the first symptoms (some fronds show chlorosis and have a dull, olive-green colour) and death of the tree. Leaflets become brittle and break easily. Necrotic streaks develop on the pinnae and many fronds acquire a jagged appearance. Leaflets are deficient in Mn and the symptoms are similar to those of frizzle-top of palms in Florida caused by deficiency of this mineral. Although no pathogen has yet been found associated with MFC, aspects of its epidemiology do not suggest a purely abiotic cause. Affected trees appear to cluster into foci and mineral analyses show no significant differences between the soils in which affected and unaffected trees are growing. This is the first report of this disease from Algeria. (I. Saadi[1], A. Namsi[2], O. Ben Mahamoud[2], M.L. Takrouni[2], A. Zouba[2], J.M. Bové[3] and N. Duran-Vila[4]. (1) Laboratoire de Phytopathologie et Diagnostic, Institut National de la Protection des Végétaux, Biskra, Algerie; (2) Institut National de la Recherche Agronomique de Tunisie, Centre de Recherches Phoenicicoles, 2260 Degache, Tunisie; (3) UMR 1090, Institut National de la Recherche Agronomique, Villenave d'Ornon, France; (4) Departamento de Proteccion Vegetal y Biotechnologia, Instituto Valenciano de Investigaciones Agrarias, Apartado Oficial, 46113 Moncada, Valencia, Espaå. BSPP, New Disease Report, Volume 13: February 2006 - July 2006)

IRAN

A New Phytoplasma Infecting Lettuce in Iran. Lettuce phyllody (LP) is an economically important disease of romaine lettuce (*Lactuca sativa*) in vegetative crop and seed crop fields in the Fars Province of Iran. Wild lettuce phyllody (WLP) occurs also in epidemic proportions in wild lettuce (*L. serriola*) during the fall in Iranian central and southern provinces, especially in Fars. Among various leafhopper species tested, *Neoaliturus fenestratus* successfully transmitted agents of LP and WLP to lettuce, wild lettuce, periwinkle, and sowthistle directly after field collection or after 5 to 7 days of feeding on diseased source plants. With primer pair P1/P7 in polymerase chain reaction (PCR), target DNA fragments (1.8 kbp) were amplified from total nucleic acid samples extracted from diseased lettuce and wild lettuce plants, but not from healthy counterparts. On the basis of disease symptoms, leafhopper transmission, and positive reaction in phytoplasma-specific PCR, Iranian lettuce and wild lettuce phyllodies agents have phytoplasmal etiology. Phylogenetic and putative restriction site analysis of 16S/23S rDNA spacer region (SR) indicated that LP and WLP phytoplasmas are members of pigeon pea witches'-broom (16SrIX) group and are closely related. Reciprocal transmission of LP phytoplasma to wild lettuce and WLP phytoplasma to lettuce by the same leafhopper species and induction of similar symptoms in common hosts are other evidences that agents of LP and WLP may be related or identical phytoplasmas. This is the first report of lettuce as a new host in pigeon pea witches'-broom group and *N. fenestratus* as a vector of a pigeon pea witches'-broom group phytoplasma. In other countries**,** phytoplasmas of aster yellows group (16SrI) are commonly associated with phytoplasmal lettuce diseases and *Macrosteles quadrilineatus* leafhopper is reported as the vector. Relatedness of WLP phytoplasma to 16SrIX group was previously reported. On the basis of the results of this study, wild lettuce and sowthistle are two reservoirs of LP phytoplasma. (M. Salehi, K. Izadpanah and N. Nejat, Department of Plant Protection, College of Agriculture, Shiraz University, Iran. *Plant Disease*, 90: 247, 2006).

LEBANON

First Report of *Tomato spotted wilt virus* on Tomatoes in Lebanon. During the spring and summer of 2004, an epidemic of *Tomato spotted wilt virus* (TSWV) (genus *Tospovirus*, family *Bunyaviridae*) was observed in an isolated tomato field at an elevation of 1,000 m in Lebanon. Symptoms were characteristic of TSWV. Seedlings came from a nursery in the coastal area of Byblos. In the spring of 2005, TSWV-like symptoms appeared on tomato in the same mountainous area, as well as on tomato, pepper, and lettuce crops in the Byblos coastal area. Initial diagnosis using TSWV ImmunoStrip Tests (Agdia, IN) gave positive results on tomato and lettuce samples. When these samples were analyzed using reverse transcription-polymerase chain reaction, a specific band (619 nt) was observed in symptomatic samples but not in healthy controls. Amplicons were cloned into the pGEM-T easy vector (Promega, Madison, WI) and three clones were sequenced in both directions (GenBank Accession No. DQ131804). Sequence analysis revealed more than 99% nucleotide identity (GenBank Accession Nos. AY744476, AJ297611, and AJ418781) and 99% amino acid identity and 100% amino acid similarity (GenBank Accession Nos. AAU95409, CAA85356, and CAD11452) to the nucleocapsid protein of several TSWV isolates. To our knowledge, this is the first report of TSWV in Lebanon. To prevent rapid spread,

farmers were informed about the disease, its vector, and appropriate preventive control measures. (Y. Abou-Jawdah[1], C. El Mohtar[1], H. Sobh[1] and M.K. Nakhla[2]. (1) Department of Plant Sciences, Faculty of Agricultural and Food Sciences, American University of Beirut, P.O. Box 11-0236 Beirut, Lebanon; (2) Department of Plant Pathology, University of Wisconsin–Madison. *Plant Disease*, 90: 376, 2006).

Occurrence of Grapevine Declines and First Report of Black Dead Arm Associated with *Botryosphaeria obtusa* in Lebanon. Grapevine, cultivated mostly in the Bekaa Plain, is one of the most important fruit crops in Lebanon. During July 2004, a survey was made in 11 vineyards of local table or wine grapes to evaluate the sanitary status of the grapevine industry as far as wood declines are concerned. The most common grapevine decline was esca. The two forms of the disease (mild and severe) were observed. The mild form was characterized by leaf symptoms consisting of interveinal necrotic spots with yellow or red chlorotic blotches on white and red cultivars. The severe form was characterized by dieback of one or more shoots, leaf drop, shrivelling, and drying of fruit clusters. In west Bekaa, on cv. Cabernet Sauvignon, some vines showed symptoms identical to those of Eutypa dieback such as stunted chlorotic shoots with small, distorted leaves; moreover, symptoms corresponding to black dead arm (BDA) such as wine red spots on the margins of leaves and dry spots were seen as reported earlier. Diseased vines of various cultivars were collected: 10 Cabernet Sauvignon (7 esca, 3 BDA, and 1 Eutypa dieback), four Beitamouni, three Carignan, two Teifihi, one Zeitouni, one Mourverdre, one Caladoc, and one Merlot. In wood, cross sections through the trunk were made that showed mainly central necrosis, white heart rot, brown red wood, and black spotting. Wedge-shaped lesions were the least common. Particularly for BDA, peeling off the bark revealed a brown streaking of the external wood. Isolations were made on malt agar (MA) with wood chips cut from the different necroses described above. Fungal identifications were based on morphological characteristics in comparison with French isolates after subculturing at 20 to 22°C: *Fomitiporia* sp. (F85-1), *Phaeomoniella chlamydospora* (F85-2), *Eutypa lata* (BX1-10, 8D, and 8F), and *Botryosphaeria obtusa* (F99-1). The fungus most frequently isolated from central necrosis with white heart rot was the basidiomycete *Fomitiporia* sp. (35% of vines). Cultures of *Fomitiporia* sp. on MA reached 4 to 5 cm in diameter after 2 weeks and were yellowish to brownish without conidia. *P. chlamydospora* (associated with esca, black goo, or Petri disease) was isolated from only 9% of vines investigated. Cultures of *P. chlamydospora* on MA were slow growing and reached 7 to 8 mm in diameter in the dark after 8 days. Colonies were white but became light green and later became dark green. Sporulation was abundant. *E. lata* (causing Eutypa dieback) was isolated from the vine of cv. Cabernet Sauvignon showing typical symptoms and from two vines showing symptoms of esca only. Two strains produced characteristic pycniospores, and all strains were identified using polymerase chain reaction (Primer Scar 10A-10B). Among the saprophytic fungi isolated from the different kinds of necroses, either central, wedge-shaped, or under the bark, *B. obtusa* associated with BDA was found most commonly (65% of vines). Cultures of *B. obtusa* were gray brown with dense aerial mycelium. Pycnidia started to form after 4 to 5 days and conidia (20 to 26×9 to 16 µm) were dark brown when mature. These results are consistent with previous descriptions. To our knowledge, this is the first report of black dead arm in Lebanon. (E. Choueiri[1], F. Jreijiri[1], G. Louvet[2] and P. Lecomte[2]. (1) Lebanese Agricultural Research Institute, Tal Amara, Zahle, Lebanon; (2) INRA UMR Santé Végétale- BP 81, Villenave d'Ornon, F33883 cedex, France. *Plant Disease,* 90: 115, 2006).

MOROCCO

First Report of *Pythium diclinum* in Morocco. *Pythium diclinum* was isolated from a reservoir near the city of Rabat (Morocco). This is the first report of its presence in this country. Taxonomic and morphological details of the fungus are presented. The isolate grew on potato carrot agar (PCA) containing various concentrations of NaCl, up to 700 mM. Pathogenicity of the Moroccan isolate was demonstrated *in vitro* on lucerne seeds and seedlings. (A. El Androusse[1], A. El Aissami[1], M. Rahouti[1], H. Lahlou[1], A. Bouloud[2] and F. Seigle Murandi[3]. (1) Laboratoire de Botanique, Département de Biologie, Université Mohammed V, Rabat, Morocco; (2) Laboratoire Central de l'Office National de l'Eau Potable, Rabat, Morocco; (3) Laboratoire de Botanique et Cryptogamie, Université Joseph Fourier, Grenoble, France. *EPPO Bulletin*, 35 (2): 261-264, 2005)

PAKISTAN

First Report of a Begomovirus Associated with Leaf Curl Disease of Bell Pepper in Pakistan. Bell pepper (C*apsicum annuum* var. *grossum*; family *Solanaceae*) is a vegetable commonly cultivated in most of the vegetable growing areas of Pakistan. Leaf samples from three bell pepper plants showing leaf curl symptoms and from two apparently healthy (symptomless) plants were collected during a recent survey for begomoviruses, from the vegetable fields around the Lahore city. Overall the disease incidence was 60-70 % with severe leaf curl symptoms. DNA was extracted from both types of samples. The presence of a begomovirus was confirmed by PCR amplification using a degenerate primer pair, designed to conserved regions of the coat protein genes, The PCR product was cloned and sequenced. The sequences obtained from bell pepper–showed the highest levels of sequence identity to *Tomato leaf curl New Delhi virus* - [Pakistan:Solanum] (syn. Solanum yellow leaf curl virus) segment A. These findings indicate that the virus of bell pepper is a new species of begomovirus for which we suggest the name Bell pepper leaf curl virus (BPLCV). Recent reports have shown that many begomoviruses of the Old World are associated with a single-stranded DNA satellite (DNA β). Attempts to identify the presence of a DNA β in the infected *Capsicum annuum* var. *grossum* samples, using universal DNA β primers produced a *ca.* 1.4 kb product, corresponding to that expected for a full-length amplicon from a satellite. This has not been sequenced but probably indicates that BPCLV is associated with a DNA satellite. To the best of our knowledge this the first report of a begomovirus associated with leaf curl disease of *Capsicum annuum* var. *grossum.* (M. Tahir and M.S. Haider, School of Biological Sciences, University of the Punjab, Quaid-i-Azam Campus, Lahore, Pakistan. (BSPP new disease reports Volume 12: August 2005 - January 2006).

SYRIA

First Record of Pome Fruit Viruses in Syria. A survey was conducted in Syria to evaluate the sanitary status of pome fruit trees. General symptoms of virus diseases were observed: i.e. chlorotic ring spots on pear leaves, chlorotic to green pale areas on apple leaves. Some trees showed symptoms of malformation and size reduction of leaves with chlorotic line patterns. Leaf samples from 754 apple, 44 pear and 14 quince plants were collected during the spring and early summer of 2003 and 2004 from the main cultivation areas of pome fruits in Syria in the following governorates: Damascus, Al-Qunaitara, Al-Swida, Homs, Hama and Latakia. All samples were tested by DAS-ELISA for *Apple mosaic virus* (ApMV), *Apple chlorotic leaf spot virus* (ACLSV) and *Apple stem grooving virus* (ASGV) using commercial kits produced by Bioreba (Switzerland). ACLSV was found in 186 apple samples (24.7% infection); ASGV was found in 24 apple samples (3.2% infection), mainly from the coastal region (Lattakia). ApMV was found in only 2 apple samples (0.3% infection). The three viruses were found only in apple. Pear and quince trees were apparently not infected with any of the tested viruses. This is the first report of pome fruit viruses in Syria. (K. Al-Jebr, F. Ismaeil, M. J. Mando, E. Al-Saadoun and S. Al-Chaabi, General Commission for Scientific Agricultural Research (GCSAR), Douma, P. O. Box 113, Damascus, Syria. *Journal of Plant Pathology*, 87 (3): 243, 2005).

TURKEY

First Report of *Alternaria mali* Causing Necrotic Leaf Spot of Apples in Turkey. During surveys performed in apple orchards in Isparta province, small, circular, brown-bordered, purplish-brown spots were seen on apple leaves. The enlarging spots coalesced and became darker on some apple cultivars. One fungus was repeatedly isolated from leaf samples obtained from 6 different locations in the province. It formed dark olive, circular, velvety colonies on PDA. Mycelia were septate, pale brown and had an average diameter of 4.2 mm. Conidia, with an average size of 20.6 x 9.25 mm had both transverse and longitudinal septa and a short false beak and were formed in long chains. The pathogen was identified as *Alternaria mali*. Pathogenicity of *A. mali* isolates was tested by inoculation with a conidial suspension (106 conidia per ml) on detached, wounded apple leaves and on apple seedlings in orchards. Symptoms were observed on detached leaves three days after incubation in a humidity chamber at 25°C and were similar to those developing on leaves of inoculated seedlings. Reisolations yielded the same fungus. In addition, isolates were grown on Czapek-Dox medium for 6 days at same temperature, without shaking. At the end of this period culture filtrate was obtained and applied to the underside of wounded leaves. Necrotic spots were observed on the leaves 24 hours after the inoculation. These results supported the contention that *A. mali* causes disease by producing a specific toxin. This is the first report of Alternaria necrotic leaf spot of apples caused by *A.mali* in Turkey. (H. Ozgonen and G. Karaca, Suleyman Demirel University, Faculty of Agriculture, Plant Protection Department, 32260 Isparta, Turkey. (BSPP, New Disease Reports, Volume 12: August 2005 - January 2006)

RESEARCH HIGHLIGHTS

ALGERIA

Genetic Diversity of *Verticillium dahliae* Isolates from Olive Trees in Algeria. *Verticillium* wilt of olive trees (*Olea europaea* L.), a wilt caused by the soil-borne fungus *Verticillium dahliae* (Kleb), is one of the most serious diseases in Algerian olive groves. To assess the pathogenic and genetic diversity of olive-infecting *V. dahliae* populations in Algeria, orchards from the two main olive-producing regions (north-western Algeria and Kabylia) were sampled and 27 *V. dahliae* isolates were recovered. For purposes of comparison, *V. dahliae* strains from France and Syria were added to the analysis. By means of PCR primers that specifically discriminate between defoliating (D) and non-defoliating (ND) *V. dahliae* pathotypes it was shown that all *V. dahliae* isolates belonged to the ND pathotype. The amount of genetic variation between the 43 isolates was assessed by random amplification of polymorphic DNA (RAPD). A total of 16 RAPD haplotypes were found on the basis of the presence or absence of 25 polymorphic DNA fragments. Genotypic diversity between the 27 Algerian isolates was low, with two RAPD haplotypes accounting for 70% of all isolates. Genotypic diversity was however greater between isolates from Kabylia than between isolates from north-western Algeria. Cluster analysis showed that most of the Algerian *V. dahliae* isolates grouped together with the French and Syrian isolates. On the basis of their ability to form heterokaryons with each other, a subset of 25 olive-pathogenic isolates was groped into a single vegetative compatibility group (VCG). These results suggest that the olive-infecting *V. dahliae* populations in Algeria show limited diversity and that caution should be taken to prevent introduction of the D pathotype. (Miloud Bellahcene[1], Komi Assigbetse[2], Zohra Fortas[3], Hean-Paul Geiger[2], Michel Nicole[2] and Diana Fernandez[2]. (1) Département de Biologie, Faculté des Sciences, Université de Mostaganem, BP 227, Mostaganem, 27 000, Algeria; (2) Institute de Recherche pour le Développement (IRD), UMR 1097 Diversité et Génome des Plantes Cultivées, Equie Résistance des Plantes, 911 Avenue Agropolis, BP 64501, 34394 Montpellier Cedex 5, France; (3) Laboratoire de Biologie des Microorganismes et de Biotechnologies, Université d'Oran-Es-Sénia, 31 000, Oran, Algeria. *Phytpathologia Mediterranean*, 44: 266-274, 2005).

EGYPT

Comparison of Two Egyptian Isolates of *Spiroplasma citri* by Crossed Immunoelectrophoresis and Polyacrylamide Gel Electrophoresis of Cell Proteins. Differences between two *Spiroplasma citri* isolates were detected by crossed immunoelectrophoresis (CIE) with intermediate gel and polyacrylamide gel electrophoresis. In the homologous reactions of Fewa isolate, eleven precipitin peaks were detected using CIE. Identical homologous reaction of Qualubia isolate was produced. One antigen (a) was specific for the Fewa isolate and one antigen (b) was specific for the Qualubia isolate when CIE with intermediate gel was used. One-dimensional electrophoresis analysis demonstrates very similar patterns of protein with two different protein bands between the two isolates of *S. citri.* (Ayman F. Omar[1],

Kamaruzman Sijam[1], Inon Sulaiman[1], Habibuddin Hashim[2] and Om-hashem M. El-Banna[3]. (1) Department of Plant Protection, Faculty of Agriculture, University Putra Malaysia, 43400 Serdang, Selangor, Malaysia; (2) Department of Biotechnology, Malaysian Agricultural Research and Development Institute, 43400 Serdang, Selangor, Malaysia; (3) Department of Plant Pathology, Faculty of Agriculture, Cairo University, Egypt. (*Plant Pathology Journal*, 5(1): 88-91, 2006).

IRAN

Distribution and Incidence of Some Aphid and Leafhopper Transmitted Viruses Infecting Sugar Beets in Iran. The main areas for field-grown sugar beet (*Beta vulgaris*) production in Iran were surveyed to study the occurrence and incidence of *Alfalfa mosaic virus* (AlMV), *Beet curly top virus* (BCTV), *Beet mosaic virus* (BtMV), *Beet western yellows virus* (BWYV), *Beet yellows virus* (BYV), Chickpea chlorotic dwarf virus (CpCDV), *Cucumber mosaic virus* (CMV), and *Turnip mosaic virus* (TuMV) during the growing season of 2001. A total of 5,292 random leaf samples in addition to 1,294 symptomatic leaves were collected from nine commercial sugar beet growing provinces of Iran and tested by tissue-blot immunoassay (TBIA). Serological diagnoses were confirmed by electron microscopy and host range studies. The highest virus incidence among the surveyed provinces was recorded in Qazvin, followed by Fars, Esfahan, Azarbayejan-e-gharbi, Khorasan, Kermanshah, Semnan, and Hamedan. According to the TBIA results, viruses in decreasing order of incidence in sugar beet were BCTV (27.9%), followed by BWYV (17.4%), CpCDV (12.5%), BYV (10.6%), BtMV (7.4%), TuMV (2.9%), AlMV (1.3%), and CMV (1.2%). Nearly 35% of sugar beets in Iran were infected by one or both of the two leafhopper-transmitted viruses (BCTV and CpCDV). Moreover, about 28% were infected by at least one of the six aphid-transmitted viruses (AlMV, BWYV, BtMV, BYV, CMV, and TuMV). Overall, one or more of the eight viruses assayed were detected in 45.5% of the plants surveyed. Several plants (35%) displaying virus-like symptoms did not react with the virus antisera used, suggesting that more viruses or virus-like agents are infecting sugar beets in Iran. In reference to the earlier reports, this is the first report of AlMV and TuMV in sugar beet fields of Iran. Also, this is the first detection of CpCDV as a pathogen of sugar beet. (Sh. Farzadfar[1], R. Pourrahim[1], A.R. Golnaraghi[2] and A. Ahoonmanesh[3]. (1) Department of Plant Virology, Plant Pests and Diseases Research Institute, P.O. Box 19395-1454, Tehran, Iran; (2) Department of Plant Protection, College of Agriculture and Natural Resources, Science and Research Campus, Islamic Azad University, P.O. Box 14515-775, Tehran, Iran; (3) Department of Plant Pathology, College of Agriculture, Esfahan University of Technology, Esfahan, Iran. *Plant Disease*, 90(3): 252-258, 2006)

***In Vitro* Screening of Fungi for Parasitism against Sugar Beet Cyst Nematode *Heterodera schachtii*.** *Heterodera schachtii* is one of the major limiting factors in sugar beet growing areas in Iran. Thirty fungal strains, isolated from the beet cyst nematode, were studied on water agar for their pathogenicity to the nematode. The rate of colonization of eggs by different fungi and hatch of second stage juveniles were measured after a month on water agar at 20 ºC. The largest and smallest colony growth on potato dextrose agar medium, recorded after 5 days at 25 ºC, were 67 and 12 mm for *Chrysosporium keratinophilum* and *Rhizoctonia* sp., respectively. Species of *Fusarium* grew form 26 to 68 mm, *Pochonia chlamydosporia* var. *chlamydosporia* and *Phoma* 17 mm, *Gliocladium* 27 to 37 mm, *Cylindrocarpon* 22 mm and *Paecilomyces lilacinus* 30 mm. The most virulent isolates were *Gliocladium* cf. *roseum*, *F. oxysporum*, *Ph. Pomorum*, *P.* c. var *chlamydsoporia* and *F. equiseti*, which colonized 72, 68, 67, 63 and 58% of the eggs respectively; 13 to 20% of juveniles hatched on these plates. *Fusarium graminiarum*, *E. chlamydospora*, *F. acuminatum armeniacum*, *C. destructans*, *P. lilacinus* and *Rhizonctonia* sp., with 51 to 41% pathogenicity, were moderately virulent. *Fusarium polyphialidicum*, *F. acuminatum acuminatum*, *G. roseum*, *F. oxysporum*, *F. solani*, *F. equiseti*, *C. obtusisporum*, *C. keratinophilum* and *F. camptoceras* were less virulent strains to *H. schachtii* and parasitized 38 to 21% of the immature eggs. Non-spore-producing strains colonized 18 to 50% of the eggs on agar. (S. Fatemy[1], F. Saeidi-Naeini[2] and A. Alizadeh[3]. (1) Nematology Department, Plant Pests and Disease Research Institute, P.O. Box 1454 Tehran 19395, Tehran, Iran; (2) Plant Pests and Diseases Research Department, Bushehr Agricultural Research Centre, Borazjan, Iran; (3) Plan Pathology Department, College of Agriculture, Tarbiat Moddares University, Tehran, Iran. *Nematologia Mediterranean*, 33(2): 185-190, 2005).

IRAQ

Influence of the Biological and Chemical Pesticides and Foliar Fertilization in Controlling the Appearance of Citrus Trees Deterioration at Rashidiya. Application of the bio-agents fungi *Trichoderma harzianum* and *Paecilomyces lilacinus* to the naturally infested soil with citrus root nematode *Tylenchulus semipenetrans* and pathogenic fungi (*Fusarium solani*) during autumn season 1999, revealed a significant decrease in their population densities compared with untreated (control) trees after two years of application. Application of Cadusafus (Rugby) and Agrifos together confirmed their high efficacy in controlling the nematode-fungi disease complex and significantly decreased their population densities. Besides the growth parameters and the yield/tree, significantly improved and increased up to 78.3, 75.6 and 71.4% of the treated trees with *P. lilacinus, T. harzianum* and Rugby + Agrifos, respectively two years after soil application. When foliar fertilizers sprayed to the trees regularly for 6 months (May-October) at two weeks intervals in each year, the yield/tree improved and increased more up to 80.3, 78.2 and78.2%, respectively. (Z.A. Stephan[1], H.M. Salih[2], I.M. Jbara[1] and H.B. Dawood[1]. (1) State Board for Agriculture Research, Ministry of Agriculture, Baghdad, Iraq; (2) State Company for Industrial Crops, Ministry of Agriculture, Baghdad, Iraq. *Iraqi Journal of Agriculture*, 10(2): 113-120, 2005).

JORDAN

Effect of Soil Amendment with Olive Mill By-products under Soil Solarization on Growth and Productivity of Faba Bean and Their Symbiosis with Mycorrhizal Fungi. Abstract: Field experiments were carried out at JUST agricultural research center during 1999-2000 growing season to evaluate the effects of soil amendment with olive mill by-products (Jift) on growth of faba bean and their

symbiosis with VA fungi. Soil was amended with Jift at different levels (Jift: Soil; 0:10, 1:9, 2:8, 3:7 and 4:6) and exposed to solarization, methyl bromide and fungicide treatments. A split plot design with three replications was used, in which soil treatments (solarization, methyl bromide, fungicide and untreated control) were assigned to main plots and soil-Jift mixtures to sub plots. Our data indicated that the maximum seed yield (2943 kg ha^{1}) was achieved under soil mixtures treated with fungicide, followed by those which treated with methyl bromide (2662 kg ha^{1}) and untreated control (2343 kg ha^{1}). When Jift was considered as main factor, seed yield was found to be increased as Jift level was increased in soil mixtures. Even so, seed yield (2861 kg ha^{1}) at the highest Jift level (3:7) was not considerably different from the yield at the rate of 2:8 (2998 kg haG^{1}). Phosphorus nutrition may be enhanced with Jift amendment remarkably for soils branded by low organic matter contents. Mycorrhizal fungi population and symbiosis with the legume crops could be increased when Jift was added to the soil, particularly under soil sterilization practices. (T.A. Assaf[1], K.M. Hameed[1], M.A. Turk[1] and A.M. Al-Tawaha[2]. (1) Department of Crop Production, Jordan University of Science and Technology, Jordan; (2) Department of Plant Science, McGill University, Macdonald Campus, 21111 Lakeshore Rd., Ste-Anne-de-Bellevue, QC H9X 3V9, Canada. *World Journal of Agricultural Sciences*, 2(1): 21-28, 2006).

LEBANON

Selective Control of *Orobanche ramosa* in Potato with Rimsulfuron and Sub-lethal Doses of Glyphosate. Previous studies indicated that foliar applications of rimsulfuron were effective in controlling *Orobanche ramosa* but phytotoxic to potato plants, while sub-lethal doses of glyphosate slightly reduced *Orobanche* infestation but were selective in potato. In this study, a single foliar application of rimsulfuron at 12.5 g ai/ha followed by single and sequential foliar applications [20, 35, 50 days after potato emergence (DAPE)] of sub-lethal doses of glyphosate (100, 200 and 300 g ai/ha) were used. All doses except the single application of rimsulfuron followed by sequential applications of glyphosate at 200 and 300 g ai/ha had no negative effect on potato growth and marketable yield, but had variable effects on *Orobanche* infestation. All doses significantly reduced O*robanche* shoot number 75 and 90 DAPE, while triple application of glyphosate following rimsulfuron was the most effective in reducing *Orobanche* shoot number after 110 DAPE and dry weight compared to the control. The best results considering both *Orobanche* control and selectivity in potato was obtained by application of rimsulfuron at 12.5 g ai/ha followed by sequential foliar application (three times) of glyphosate at 100 g ai/ha. (M.A. Haidar, M.M. Sidahmed, R. Darwish and A. Lafta, Faculty of Agricultural and Food Sciences, American University of Beirut, Riad El-Solh, Beirut 1107 2020, Lebanon. *Crop Protection*, 24(8): 743-747, 2005).

MOROCCO

Biological, Serological and Molecular Characterization of Three Isolates of *Citrus tristeza closterovirus* Introduced into Morocco. The biological, serological and genomic diversity of three *Citrus tristeza virus* (CTV) isolates from various geographical regions was studied: isolate P1 from lemon cv. 'Meyer' in a field near Marrakech (MA) in 1983, and isolates P2 and R1 detected in imported Spanish clementine germplasm by the Moroccan NPPO in 1998 and 2000. P1 induced severe vein clearing on Mexican lime and grapefruit, mild stem pitting on Mexican lime and moderate stem pitting on grapefruit. P2 and R1 only induced mild vein clearing on Mexican lime and caused no stem pitting or other symptoms on indicator plants used as controls. Only isolate P1 reacted with monoclonal antibody MCA-13, whereas all isolates reacted positively with the 3DF1+3CA5 mixture. The Moroccan clones P1–3 and P1–5, and all other severe isolates obtained from GenBank, showed a phenylalanine at amino acid position 124 of their coat protein sequences. This epitope confers MCA13 reactivity. The Spanish clones had tyrosine instead at this position. The deduced amino-acid sequence of coat protein of P1 clones clusters close to severe strains CB3–104 and FL7, respectively from Brazil and USA (Florida) (Group 5), whereas the sequences from P2 and R1 cluster close to typical strains from Portugal 25–120 and USA (Florida) T30 (Group M). The three techniques for distinguishing CTV isolates were clearly correlated. (B. Lbida[1], A. Bennani[1], M. N. Serrhini[2] and M. Zemzami[3]. (1) Université My Ismail, Faculté des Sciences, B.P. 1040, Meknès, Morocco; (2) Ecole Nationale d'Agriculure Meknès, B.P. 40, Meknès, Morocco; (3) Unité de Contrôle des Plantes, Direction des Domaines Agricoles, Km 11, Salé, Morocco. *EPPO Bulletin*, 35(3): 511-517, 2005).

PAKISTAN

***Pseudomonas aeruginosa* Mediated Induction of Systemic Resistance in Tomato Against Root-knot Nematode.** Plant growth-promoting rhizobacterium *Pseudomonas aeruginosa* strain IE-$6S^{+}$ suppresses root-knot nematode (*Meloidogyne* spp.) indirectly by enhancing defense mechanism leading to induced systemic resistance in tomato. However, which determinants are important in the induction of resistant reaction in plants against nematode by IE-$6S^{+}$ is yet fully understood. Salicylic Acid (SA) production by bacteria acts as endogenous signal for the activation of certain plant defense responses. In a split root trial with tomato plant as a host and *M. javanica* as challenging pathogen, IE-$6S^{+}$ induced systemic resistance in both wild type and NahG tomato seedlings. Moreover, the bacterial efficacy against nematode was not altered when soil chemical compositions was changed by the addition of iron. These results suggest that *P. aeruginosa* IE-$6S^{+}$ suppress root-knot nematode indirectly via enhanced defense mechanism in plants, which is independent of SA accumulation in the host. (Imran Ali Siddiqui and Syed Shahid Shaukat, Soil Biology and Ecology Laboratory, Department of Botany, University of Karachi, Karachi-75270, Pakistan. *Plant Pathology Journal*, 4(1): 21-25, 2005).

SYRIA

Integrating Cultivar Resistance with Row Spacing to Manage Ascochyta Blight for Increased Chickpea Yields. The influence of different row spacings on the development of Ascochyta blight and on the grain yield of chickpea *(Cicer arietinum)* was evaluated during the 1997 and 1998 cropping seasons. Two chickpea cutivars (Ghab 1 and Ghab 3) and 2 breeding lines (FLIP 90-96 and F 88-85) were used in the

field trials at 3 locations, representing the different agroecological zones in which winter chickpea is grown in Syria and in most of the Mediterranean countries. Four row spacings, (15, 30, 45 and 60 cm), were evaluated in all the trials at the different locations. All plots were initially inoculated with infected chickpea debris and disease development followed natural prevailing environmental conditions. Ascochyta blight disease severity ratings were taken at early flowering and again at podding and grain yield for each plot was measured at harvest. There was a significant ($p<0.05$) decrease in disease severity as the row spacings were increased, in most of the entries at all the locations, for both years. There was a corresponding significant increase in grain yields with less disease at wider row spacings. The increase in grain yield was due to the added factor of increased plant branching at wider row spacings, than from less disease alone. This was noted in the more resistant entry (F90-96) which showed no significant change in disease severity with increased row spacings but still had a significant yield increase at wider row spacings at all the 3 locations. It would appear from this study that under Syrian and Mediterranean conditions, an increase in grain yield is expected when chickpea is planted at wider row spacings during winter. This increase is due both to lower Ascochyta blight severity and increased plant branching. (C. Akem, S. Kabbabeh and S. Ahmed, International Center for Agricultural Research in Dry Areas (ICARDA) P.O. Box 5466, Aleppo, Syria. *Plant Pathology*, 4(1): 46-50, 2005)

Preliminary Evaluation of the Status of Olive-Infecting Viruses in Syria. Field surveys of 80 commercial groves were made in autumn 2003 in six major Syrian olive-growing regions. A total of 300 olive samples, representative of the main cultivars grown in the country, were collected. As ascertained by dsRNA analysis, 54 out of 125 samples (about 43%) showed visible bands in polyacrylamide gel electrophoresis. All samples were tested by RT-PCR for the presence of the following viruses: *Arabis mosaic virus* (ArMV), *Cherry leaf roll virus* (CLRV), *Cucumber mosaic virus* (CMV), *Olive latent ringspot virus* (OLRSV), *Olive latent virus 1* (OLV-1), *Olive latent virus 2* (OLV-2), *Olive leaf yellowing-associated virus* (OLYaV) and *Strawberry latent ringspot virus* (SLRSV). All these viruses, singly or in mixed infection, were detected in about 51% of the samples. CMV was the most prevalent (22.7%), followed by CLRV (15%), OLYaV (14.3%) and OLRSV (11.5%). Less represented were the remaining four viruses. Infection rates ranged from 44% in Dara'a region to 67% in Latakia and Hama. (A. Al Abdullah[1], T. El Beaino[1], M. Saponari[2], H. Hallak[3] and M. Digiaro[1]. (1) Istituto Agronomico Mediterraneo, Via Ceglie 9, 70010 Valenzano, Bari (Italy); (2) Dipartimento di Protezione delle Piante e Microbiologia Applicata, Università degli Studi and Istituto di Virologia Vegetale del CNR, Bari, Italy; (3) Department of Olive Research, GCSAR, Idleb, Syria. *EPPO Bulletin*, 35(2): 249-252, 2005).

Study of Wilt and Dryness Disease on *Pinus pinea* Seedlings. During 2002 and 2003 we observed yellowing and wilt on *Pinus pinea* seedlings in nurseries. Seven fungi seedlings were isolated from stems, roots and soil of infected and non-infected one year and 3 months old. These fungi are: *Fusarium*, *Pythium*, *Rhizoctonia*, *Alternaria*, *Aspergillus*, *Penicillium* and *Trichoderma*. All belonging to Oomycetes and Deuteromycetes. We identified two species of *Fusarium*, *F. oxysporum* and isolated them from stems, roots and soil of infected seedlings, the percentage of stem infected is 100%. The species *F. solani* was isolated from roots and soil. The percentage of roots infected is 66.7-100%. The two species were pathogens which caused the same symptoms after two months. The percentage of the seedlings infection of *Fusarium* genus in 4 intervals of time were 42.8, 50.6, 37.9 and 38.4, respectively in one year-old seedlings. The percentage was 44.7, 28.3, 48.5 and 54.0 in soil infected seedlings in three months old. The *Pythium* was found in small percentage in the soil infected seedlings in some time only. Reversely, *Trichoderma* found in soil of non-infected seedlings and in all times. The lengths of infected seedlings decreased in 40% for one year seedlings old, 27.5% for three months seedlings old, and caused 50% of mortality for 3 months infected seedlings old. (Sabah Amaghribi, Plant Protection Department, Faculty of Agriculture, Tishreen University, Lattakia, Syria. *Tishreen University Journal for Studies and Scientific Research - Biological Sciences Series*, 27(1): 73-82, 2005).

SYRIA & TURKEY

Occurrence and Distribution of Species of the *Heterodera avenae* Group in Syria and Turkey. A survey of cyst nematodes showed that 69.9% and 80% of cereal fields were infested, respectively, in Syria and Turkey. Based on morphometrics, three species belonging to the Heterodera avenae group were identified. In Syria, *Heterodera latipons* was the dominant species, being found in 96% of the cereal fields; *Heterodera avenae* has a very limited distribution, being found in only three fields of northern and central regions. *Heterodera filipjevi* was detected for the first time in one barley field in Northern Syria near the Turkish border. In Turkey, *H. filipjevi* and *H. latipons* were widely distributed in the Central Anatolian Plateau occurring as single species in 37.5% and 33.3% of infested fields, respectively, and as species mixtures in 29.2% of infested fields. Phylogenetic and phylogeographic research prospects in this group of cyst nematode sand control methods based on the use resistance genes in cereals are discussed. (H. Abidou[1], A. El-Ahmed[1], J.M. Nicol[2], N. Bolat[3], R. Rivoal[4] and A. Yahyaoui[5]. (1) Faculty of Agriculture, Aleppo University, Aleppo, Syria; (2) International Maize and Wheat Improvement Center (CIMMYT), P.O. Box 39, Emek, 06511, Ankara, Turkey; (3) Anadolu Agricultural Research Institute, Eskisehir, Turkey; (4) INRA/AGROCAMPUS Rennes, UMR Biologie des Organismes et des Populations appliqué a la Protection des Plantes (BiO3P), BP 35327, 35653 Le Rheu, France; (4) International Center for Agricultural Research in the Dry Areas (ICARDA), P.O. Box 5466, Aleppo, Syria. *Nematologia Mediterranea*, 33(2): 195-201, 2005).

TUNISIA

Development of a Rapid RT-PCR Test for the Detection of Peach Latent Mosaic Viroid, Pear Blister Canker Viroid, Hop Stunt Viroid and Apple Scar Skin Viroid in Fruit Trees from Tunisia. A reverse transcription polymerase chain reaction was developed to investigate the occurrence of *Peach latent mosaic viroid* (PLMVd), *Pear blister canker viroid* (PBCVd), *Hop stunt viroid* (HSVd) and *Apple scar skin viroid* (ASSVd) on fruit trees (peach, pear,

almond and apple) in Tunisia. The test was initially performed with total RNA preparations from selected isolates and then applied to total RNA preparations from leaf or bark tissues of fruit trees collected in the north of Tunisia and the Sahel. PLMVd was found to occur in peach and pear trees, HSVd in pear, peach and almond trees, and PBCVd in pear trees. Mixed PBCVd–HSVd and PLMVd–HSVd infections occurred naturally in pear trees. ASSVd was not detected in any samples from apple trees. The identity of the detected viroids was confirmed by comparing their sequences with those of other previously characterized isolates. The test was then simplified by direct use of diluted crude plant extracts. The results obtained from crude sap extracts of leaves or bark tissues and from total RNA preparations were identical. This improved test is thus quick and useful for large-scale routine analysis. It can be used in a certification programme to contribute to prevention of the occurrence and spread of PLMVd, HSVd, PBCVd and ASSVd in Tunisia. (I. Fekih Hassen[1,2], S. Roussel[1], J. Kummert[1], H. Fakhfakh[2], M. Marrakchi[2] and M. H. Jijakli1[1]. (1) Plant Pathology Unit, Faculté Universitaire des Sciences Agronomiques, Passage des Déportés 2, 5030 Gembloux, Belgium; (2) Laboratory of Molecular Genetic, Immunology and Biotechnology, Faculty of Sciences of Tunis, 2092 Elmanar Tunis, Tunisia. *Journal of Phytopathology*, 154 (4): 217-223, 2006).

Potato Vascular *Fusarium* Wilt in Tunisia: Incidence and Biocontrol by *Trichoderma* spp. Pathogen isolations from potato tubers showing dry rot symptoms revealed the presence of *Fusarium oxysporum* f. sp. *uberose* in different Tunisian regions. Pathogenicity tests of different isolates were realized on potato plants. Typical symptoms of vascular wilt disease were observed and noted. After wilting, inoculated plants were totally damaged. *Trichoderma* spp. were evaluated for their antagonistic potential against *F. oxysporum* f. sp. *tuberose* in *vitro* and *in vivo*. *Trichoderma harzianum*, *T. viride* and *T. virens* inhibited the mycelial growth of *F. oxysporum* f. sp. *tuberose*. The antagonism included lysis and dissolution of the host cytoplasm and/or transformation into cords and/or coiling around pathogen hyphae. Moreover, substrate application of *Trichoderma* species (10^8 spores per ml) before inoculation by *F. oxysporum* f. sp. *tuberose* controlled *Fusarium* wilt of potato plants compared with non-inoculated plants and untreated-inoculated plants. This approach may be beneficial for biological control in *F. oxysporum* f. sp. *tuberose* and could allow protecting plants from this pathogen. (Fakher Ayed[1], Mejda Daami-Remadi[2], Hayfa Jabnoun-Khiareddine[1] and Mohamed El Mahjoub[1]. (1) Department of phytopathology, Horticultural High School of Chott- Mariem 4042 Sousse, Tunisia; (2) National Institute of Agronomic Research, Tunis, PRRDA-CE Chott- Mariem 4042 Sousse, Tunisia. *Plant Pathology Journal*, 5(1): 92-98, 2006)

Susceptibility of Some Stone and Pome Fruit Rootstocks to Crown Gall. The susceptibility of different fruit rootstocks to crown gall disease was investigated in greenhouse and field experiments with numerous strains of *Agrobacterium tumefacience* over three years. Plants were inoculated in the roots and shoots for pot experiments. Field experiments were performed in a naturally contaminated nursery plot. The genotypes *Prunus dulcis* and *P. persica* showed a high level of susceptibility to *A. tunefacience*. Among the stone rootstocks, bitter almond was highly susceptible in all experiments. Apricot and Cadaman rootstocks displayed low susceptibility but larger galls, showing that there was no relation between rootstock susceptible and gall size. Among pome rootstocks, quince BA29 was resistant to the disease, while MM106 was susceptible in potted trials; however, in the field assays, pome rootstocks did not become galled, possibly because the strains has selected for and adapted to stone rootstocks. (Ali Rhouma[1], Ali Boubaker[2], Xavier Nesme[3] and Yves Dessaus[4]. (1) Institut de l'olivier, Unité de recherché Protection des plantes cultivvées et environnement, Route de Sokra Km 1,5-3003 Sfax, Tunisia; (2) Institut National Agronomique de Tunisie, Laboratoire de Phytopathologie, 43 Av. Charles Nicolle 1082, Cité Mahrajéne, Tunisia; (3) Ecologie Microbienne, Université Claude Bernard-Lyon 1, UMR CNRS 5557, 43, Boulevard du 11 Novembre 1918, 69622 Villeurbanne Cedex, France; (4) Institut des Sciences du Végétal, CNRS, bat 23-Avenue de la Terrasse, F-91198 Gif sur Yvette Cedex, France. *Phytopathologia Mediterranean*, 44: 275-284, 2005).

UNITED ARAB EMIRATES

Longevity, Fecundity, and Fertility of the Red Palm Weevil, *Rhynchophorus ferrugineus* Olivier (Coleoptera: Curculionidae) on Natural and Artificial Diets. Life parameters including pre-oviposition period, oviposition period, larval and pupal periods, adult male and female development times, and generation span, were obtained for the red palm weevil, *Rhynchophorus ferrugineus* Olivier, reared on artificial diets of oat, potato, pineapple, and palm fiber sheath, and on natural diets of sugarcane, palm heart, and palm leaf base. Significant differences in the duration of all life parameters were found when fed on various diets. The pre-ovipositional periods ranged from 3.15 to 3.61 days, while the oviposition periods ranged from 3.2 to 3.8 days. The developmental times of larvae ranged from 70.8-102.2 days, while the development time of pupae ranged from 16.1 to 22.2 days. The development time of adults previously reared on natural diets were longer than those fed on artificial diets. Difference in the development time occurred between males and females reared on different diets, except on sugarcane and palm leaf base. The generation span ranged from 93.2 to 131.3 days. Significant differences in the average number of eggs deposited per female, previously reared in their larval stages on various diets, ranged from 68.2 to 185.2 eggs, while the average number of eggs deposited per female per day ranged from 1.28 to 3.03 eggs. The percentage of hatchability (viability of eggs) ranged from 74.3 to 93.3%. The mean total number of eggs laid by females, eggs deposited 30 days after one full copulation with males of similar age, and rate of egg hatch decreased significantly with increasing weevil age, and ranged from 65.5 eggs (1 day old female) to 43.5 eggs (45 days old female). The rate of egg hatch, also decreased significantly with increasing weevil age, and ranged from 75.8% (1 day-old weevils) to 47.4% (45 days-old weevil). The short copulatory period was adequate for insemination of the female during copulation. Feeding of *R. ferruginous* on different diets resulted in different life parameters. (Walid Kaakeh, Department of Aridland Agriculture, College of Food and Agriculture, United Arab Emirates University, P.O. Box 17555, Al-Ain, UAE. *Emirates Journal of Agricultural Sciences*, 17(1): 23-33, 2005).

YEMEN

Monitoring Date Palm Stalk Borers *Oryctes* spp. Using Light Traps in March 2003-February 2004 at Seiyun Area in Wadi Hadramout-Yemen. Date palm stalk borers *Oryctes* spp. are important date palm pests attacking date palm trees and causing a lot of losses in Wadi Hadramout. This research aims at monitoring the occurrence of the pest using modified Hjstand light traps that were installed during the period March 2003-February 2004 at Seiyun area in Wadi Hadramout; and studying the effect of some ecological factors that affect their occurrence in the area. The results have shown that the pest started to appear in light traps in the first week of March and reached their maximum number (188) in May 2003. The number decreased gradually in September, October and November; and in December, it completely disappeared. The pest started to appear again in January and February in low numbers with a mean number of 5 and 7, respectively. It has been shown that the pest has only one generation per year, and the sex ration was 1.8:1 females to males. There was no statistical significant difference (at 5% level) between the increase and decrease of the population of the pest that could be affected by the decrease r increase of temperature or relative humidity. The appearance of the moon has no relationship with the catching of the pest, as there was no statistical significant difference (at 5% level) in numbers caught on moony or dark nights. It have been concluded that light traps could be used successfully in monitoring the pest and reducing its number, and could also e used in any IPM program for the management of this pest (Saeed A. Ba-Angood and Saleh O. Al-Baity, Department of Plant Protection, Nair's College of Agriculture, University of Aden, Yemen. *University of Aden Journal of Natural and Applied Sciences*, 9(2): 221-228, 2005).

❖ SOME PLANT PROTECTION ACTIVITIES OF FAO AND OTHER ORGANIZATIONS

DESERT LOCUST SITUATION

General Situation during May 2006 Forecast until mid-July 2006

The Desert Locust situation remained calm during May. The only significant locust activity was in Algerian Sahara where locust numbers increased slightly because of small-scale breeding in parts of the centre and southeast. Ground control teams treated nearly 4,000 ha. Elsewhere in the spring breeding areas in Northwest Africa, isolated adults and hoppers were present at one place along the Moroccan/Algerian border. Dry conditions prevailed in nearly all the other recession countries and very few locusts were reported. During the forecast period, low numbers of locusts should start to appear in parts of the summer breeding areas in the northern Sahel in West Africa and Sudan as well as along the Indo-Pakistan border. Small-scale breeding will commence in these areas with the onset of the seasonal rains.

Western Region. Small-scale breeding continued in eastern Algeria, giving rise to an increasing number of solitarious and *transiens* adults. Limited breeding occurred in central Algeria where solitarious hoppers and adults were present. Control operations were conducted mainly in eastern Algeria against the higher density infestations. Very little breeding is thought to have occurred this spring in other areas of Northwest Africa because of poor rainfall and dry conditions. Only a few isolated hoppers and adults were seen in Morocco near the Algerian border. No locusts were reported elsewhere in the region although isolated adults may be present in a few places in Western Sahara, northern Mauritania, northern Mali, and the Air Mountains in Niger. Surveys should commence during the forecast period in the summer breeding areas in the northern Sahel in Mauritania, Mali and Niger as low numbers of locusts are likely to appear and lay eggs once the summer rains commence.

Central Region. Ecological conditions remained dry in the region and few locusts were reported during May. A solitary adult was seen on the Red Sea coastal plains in Eritrea and there was an unconfirmed report of locusts on the coast in northwest Somalia. No locusts were reported elsewhere in the region. Low numbers of adults are likely to appear and eventually lay eggs in the summer breeding areas in Sudan and in the interior of Yemen once the rains start. Surveys should commence in both countries during the forecast period.

Eastern Region. Mainly dry conditions prevailed and no locusts were reported in the region during May. Low numbers of adults are expected to appear along both sides of the Indo-Pakistan border and breed on a small scale once the monsoon rains start. No significant developments are expected.

BRIEF NOTE ON THE INTERNATIONAL PLANT PROTECTION CONVENTION (IPCC)

The International Plant Protection Convention (IPPC) is an international treaty relating to plant health. The convention as adopted by the FAO conference in 1951. In 2006 there were 153 contracting parties to the convention, including 23 Arab and Near East countries. The purpose of the convention is to secure common and effective action to prevent the spread and introduction of pests of plants and plant products, and to promote appropriate measures for their control.

The IPPC not only applies to protection of cultivated plants and plant products but also extends to the protection of natural flora (and thus the environment). Its scope covers organisms that can cause indirect damage to plants as well as invasive species such as weeds. The convention's provisions cover conveyances, containers, storage places, soil and any other objects or material capable of harboring plant pests. The IPPC therefore provides a comprehensive framework of dealing with issues of plant protection and for the harmonization of phytosanaitary measures. It emphasizes international cooperation and technical exchange.

The principle organization administrating and implementing the IPPC is the commission for Phytosanaitary Measures (CPM). Among its roles the CPM develops and adopts the International Standards for Phytosanaitary Measures (ISPMs) and establishes procedures for the regulation of procedures.

The IPPC Secretariat established in 1992 within FAO, has particular importance in implementing the policies and activities of the CPM including standards setting, publishing information relating to the IPPC, facilitating information exchange between contracting parties, coordinating activities

of regional plant protection organizations and providing technical assistance. The FAO provides the convention's secretariat. The national plant protection organizations NPPOs, (national plant protection centers, directorates, departments…) are the official services established by governments to discharge the functions specified by the IPPC.

The regional plant protection organizations RPPOs are intergovernmental organizations providing coordination on a regional level for the activities and objectives of the IPPC.

In the 1990's the IPPC secretariat and the RPPO's began formulating international Standards for Phytosanaitary Measures ISPMs intended to harmonize plant protection regulations applied in the international trade. These ISPMs have particular importance because World Trade Organization (WTO) members are required to base their phytosanaitary measures on international standards developed by the IPPC. ISPMs pass through three development stages; draft, consultation and approval. In the approval stage, after further consideration by the CPM an ISPMs is adopted. The standard is published and distributed by the IPPC secretariat. Since 1993 many standards have been proposed and are at different stages in the standard – setting process. A complete list of current ISPMs, including those in draft and consultation stage is available on the IPPC web site (www.ippc.int).

INTEGRATED MANAGEMENT OF BROOMRAPE IN THE NEAR EAST REGION

Broomrape (*Orobanche* spp.) is a damaging parasitic weed found throughout the Mediterranean and the Near East region. While research institutions have developed a range of technologies to manage parasitic weeds, Orobanche infestation continues to increase, threatening the livelihood of farmers across the region. Many of the developed technologies have not been effectively disseminated to farmers and remain largely unknown or have not been tested on-farm to allow adoption by farmers. Farmers, therefore, continue to use inappropriate management practices that exacerbate the *Orobanche* problem. Recognizing the challenge of improved dissemination of Orobanche management skills to farmers, a 2-year technical cooperation project (TCP/INT/3004) involving FAO, ICARDA and seven countries in the region (Algeria, Egypt, Ethiopia Morocco, Sudan, Syria, and Tunisia) was initiated in 2004/2005 for improved dissemination of knowledge through farmer field schools (FFS). In each country, facilitators established four FFS with 25 selected farmers participating in each FFS. The successful establishment of FFS and implementation of the FFS curriculum during this pilot project made many farmers aware of the serious threat posed by *Orobanche* and provided opportunities for farmers to unravel the complex issues of its biology and management. A meeting was recently held in Cairo, Egypt (20–22 June, 2006) to discuss the TCP project results of the past two years presented by participating countries, to discuss and finalize a 4-year regional project proposal on *Orobanche* management that was formulated to build on the success of the pilot project, and to implement sustainable *Orobanche* management options in the long-term. The recommendations made emphasized: a) the need for governments to ensure an enabling policy environment for *Orobanche* management, b) the development of an *Orobanche* database, c) increased farmer awareness and community ownership of *Orobanche* management strategies, d) integrated *Orobanche* management with emphasis on preventive measures, e) long-term commitment to research and development to refine available technologies and develop new ones, and f) regional collaboration.

9TH ARAB CONGRESS OF PLANT PROTECTION
19-23 November, 2006, Damascus, Syria

The Organizing Committee of the 9th ACPP received around 550 abstracts from Jordan, Tunisia, Algeria, Saudi Arabia, Oman, Sudan, Syria, Iraq, Qatar, Libya, Egypt, Lebanon, Palestine, Morocco and Yemen, in addition to papers from Iran, Pakistan, France, Italy and the United Kingdom. The papers will be presented in 50 oral or poster sessions which cover Economic Pests, Fungal Pathogens, Bacterial Pathogens, Viral Pathogens, Nematodes, Weeds, Mites, Natural Enemies, Plant Extracts, Host Resistance, Biological Control and Integrated Pest Management. In addition, there will be crop oriented sessions; such as sessions on date palm pests, citrus pests and olive pests.

Arrangements were also made to invite known scientists from the region and the world to discuss specific issues in plant protection distributed in four symposia *(please see the last issue of the newsletter to see the topics and the invited speakers).*

For more information on any of the congress arrangements please contact either Dr Safaa Kumari (Email: s.kumari@cgiar.org) or Mr Jamal Mando (Email: jamalagr@mail.sy). You are also advised to see the congress website (www.9acpp-sy.org).

12TH CONGRESS OF THE MEDITERRANEAN PHYTOPATHOLOGICAL UNION (MPU) RHODES ISLAND, GREECE, JUNE 11-15, 2006

The 12th Congress of the Mediterranean Phytopathological Union (MPU) was held recently in Rhodes Island, Greece, June 11-15, 2006, where around 200 scientists from all the Mediterranean countries participated. In addition, scientists from the USA, New Zealand, Switzerland, Germany, Iran, United Kingdom, the Netherlands and South Africa joined the meeting. Arab scientists from Algeria, Egypt, Iraq, Jordan, Lebanon, Syria and Tunisia participated in the congress. The meeting program included four days of paper presentation sessions and a one day field trip around

historical sites in Rhodes Island. Dr. Khaled Makkouk was elected as the MPU President for a three years term 2006-2009. Dr. Safaa Kumari was assigned the position of editor of the MPU Newsletter, which appears twice a year. As Drs. Makkouk and Kumari are active ASPP members, this new assignment will bring more collaboration between ASPP and the MPU. The 13th MPU congress will be held at Bibliotica Alexandrena, Alexandria, Egypt, in June, 2009.

Participants of the 12th Congress of the Mediterranean Phytopathological Union (MPU) during the field trip around historical sites in Rhodes Island, Greece, June 2006.

❖ SHORT PLANT PROTECTION NOTES

- Jasmonic acid induces a systemic defense response that reduces virulent root-knot nematode reproduction on susceptible tomato plants, report W. R. Cooper and associates at University of Arkansas and University of Kentucky. (J. Chem. Ecol. 31:1953-1967, 2005).
- About 60% of taxa growing on wooden boxes used for storage of carrots caused lesions on carrots in cold storage and represent a threat in re-use of boxes in storage, report C. Kora and associates at University of Guelph, Canada. (Plant Pathol. 54:665-670, 2005) .
- Crossing cultivated chickweed with wild *Cicer reticulatum* gave hybrids with high degrees of resistance to wilt, foot rot, and root rot, plus a yield increase, report S. Singh and associates at Punjab Agricultural University, India. (Plant Breed. 124:477-480, 2005)
- Pine wilt disease is likely a complex induced by both the pine wilt nematode andassociated phytotoxin-producing bacteria according to B. G. Zhao and F. Lin at Nanjing Forestry University, Nanjing, China. (For. Pathol. 35:339-345, 2005).
- Root-knot nematode-resistant cowpea is an effective cover crop for protecting susceptible vegetable crops grown under irrigation (enhanced by incorporation of its green biomass), report P. A. Roberts and associates at University of California, Riverside. (Agron. J. 97:1626-1635, 2005).
- Percent yield suppression caused by *Meloidogyne incognita* increased linearly as yield potential increased in cotton so nematode management becomes increasingly important according to R. F. Davis at USDA-ARS and O. L. May at University of Georgia, Tifton. (Crop Sci. 45:2312-2317, 2005) .
- Some dry bean breeding lines were resistant to common and halo blights greater than their parents and were resistant to Bean common mosaic virus, report M. C. Asencio- S.-Manzanera and associates at Instituto Tecnológico Agrario de Castilla y Leon, Spain; and University of Idaho. (Crop Sci. 46:131-135, 2006)
- Drenching strawberry plants infested with *Pratylenchus penetrans* with butyric acid (0.1 and 1 M) reduced nematode densities 98-100%, report M. Browning and associates at the University of Rhode Island, Kingston. (Soil Biol. Biochem. 38:401-404, 2006).

❖ GENERAL NEWS

AN INNOVATION: THE LIGHT EQUIPPED POWER INSECT SUCKER (LEPIS)

Use of conventional pesticides on edibles leads to disaster when the user is illiterate and the consumer is ignorant. People face this problem all over in the under developed countries where mono-cropping system is a common practice. The vegetable growing belts around cities as well as rice, cotton and maize farming areas of the Indian sub-continent come under this category. Anyway, if well informed, human beings can wisely tackle the situation to a certain extant but the local wildlife can't thrive in such a polluted environment. This is why many of the prized wild animals and bird species have gone extinct and the others are facing serious threats in such cultivated landscapes where high potency pesticides, fertilizers and even banned chemical products are still in use.

The basic idea of our research is to curtail the use of highly toxic chemical pesticide in the agro-ecosystem for safety of all living beings and as an attempt to meet obligations of the WTO to be imposed in the coming years. This is only possible if some non-chemical, biological/mechanical methods of pest management are evolved and introduced at all levels on a larger scale. The light equipped power insect sucker (LEPIS) is a night device,

which attracts and kills the insects mechanically. Being environment friendly, this kind of equipment can be proved to be safe for human beings and will certainly help in the conservation management of wildlife and the related habitats.

Power Insect Sucker (PIS): A "Solo Sprayer Machine" was converted into a Power Insect Sucker by re-designing its wind fan and the air suction mechanics. The machine was tested on cotton and different vegetable crops for its efficacy in reducing insect burden on crop foliage. The results of this initially developed portable model of the machine were found to be encouraging. However, during careless operation, it may damage the crop leaves. To overcome this defect a newer model was fabricated with a modified sucking mechanism and tested at successive growth stages of different crops and vegetables with promising results. The hypothesis derived for field experience was that the Power Insect Sucker is highly effective device but little time consuming and laborious. Ultimately, during the second phase of the research, attention was diverted towards improving efficacy of the machine to make it a success. (Rashid Ahmad Khan[1], Sandy M. Smith[1] and M. Fahd Rasheed[2]. (1) Faculty of Forestry, University of Toronto, Ontario, Canada; (2) University of Agriculture, Faisalabad, Pakistan. SAIC Newsletter, www.saic-dhaka.org)

RICE ENGINEERED WITH SHEATH BLIGHT RESISTANCE

Sheath blight is a disease of rice that afflicts the crop in most rice-growing areas of the world. Caused by the fungus *Rhizoctonia solani*, sheath blight is controlled by fungicides, a practice which is neither practical nor sustainable, and causes damage to both human health and the environment. Genetically engineering *R. solani* resistance into rice is thus a promising approach for the management of sheath blight disease.

Krishnan Kalpana and colleagues of Tamil Nadu Agricultural University, India, take the steps toward this goal as they undertake "Engineering sheath blight resistance in elite indica rice cultivars using genes encoding defense proteins." Their work appears in a recent issue of Plant Science. The authors aimed to develop rice cultivars with enhanced resistance to sheath blight by genetically transforming high yielding indica rice cultivars, ADT38, ASD16, IR50, and Pusa Basmati1 (PB1), with the rice *tlp* gene, which encodes a pathogenesis-related (PR) protein. PR proteins can enhance plant resistance to pathogens when over-expressed.

The researchers report that the engineered rice had increased resistance to *R. solani* when compared with non-transformed plants; and that resistance was enhanced when *tlp* was co-transformed with rice *chi11*, a gene encoding a chitinase, another anti-fungal protein. In addition to sheath blight resistance, the *tlp* or *chi11* transgenic lines were also resistant to the rice sheath rot pathogen, *Sarocladium oryzae*.

Subscribers to Plant Science can read the complete article at http://dx.doi.org/10.1016/j.plantsci.2005.08.002

TOMATO EQUIPPED WITH LEAF CURL VIRUS RESISTANCE

Tomato is an important vegetable crop to many countries, but is plagued by a variety of viral diseases. One of the most devastating viruses is a group with the generic name Tomato Leaf Curl Virus (ToLCV), which are transmitted by whiteflies, and which cause tomato leaf curl disease (ToLCD). Efforts to breed tomato varieties resistant to the disease have hitherto been unsuccessful, since natural sources of resistance are not available.

Genetically engineering resistance remains a viable alternative to equipping tomato with protection against ToLCV. One method is introducing pathogen-derived resistance (PDR), by either allowing transgenic tomato to produce a shorter version of the viral protein (protein-mediated resistance) or RNA (RNA-mediated resistance). Shelly Praveen and colleagues of the Indian Agricultural Research Institute investigate the possibility of "Engineering tomato for resistance to tomato leaf curl disease using viral rep gene sequences" in a recent issue of the Plant Cell, Tissue, and Organ Culture journal.

Scientists transformed, via *Agrobacterium*¸ tomato cells with replicase (rep) gene sequences of ToLCV. Transgenic plants were tested for disease resistance by exposing them to a high population of whiteflies reared on virus-infected plants. Researchers recorded a high level of resistance to ToLCV and inheritability of the transgene, up to the T2 stage following challenge inoculation with the virus. The mechanism of resistance, according to researchers, appears to be RNA-mediated, since plants carried the untranslatable anti-sense rep gene.

Subscribers to the journal can read the complete article at http://dx.doi.org/10.1007/s11240-005-7858-8.

NON-PATHOGENIC ISOLATES RECRUITED IN FIGHT AGAINST BANANA FUSARIUM WILT

Worldwide, bananas rank fourth as world's most valuable food crop with a global, annual production of almost 80 million metric tons, of which 72 million tons are produced in developing countries. Bananas and plantains constitute a major staple food crop for millions of people in developing countries, and about 80% of the global banana production is produced by small scale farmers and sold in local markets. Fusarium wilt is one of the most devastating banana diseases at the global level, and a major constrain to banana production.

Researchers at the University of Pretoria, South Africa, have conducted a study to evaluate the ability of non-pathogenic fungal and bacterial isolates from South African soils to suppress banana fusarium in glasshouse conditions. Several biological control agents and products were included in the study. The report: "The potential of non-pathogenic *Fusarium oxysporum* and other biological control organisms for suppressing fusarium wilt of banana" is published in the latest issue of the scientific journal Plant Pathology.

The authors report that two non pathogenic Fusarium isolates and one bacterial isolate reduced fusarium wilt incidence by 87.4, 75.0 and 87.4%, respectively in glasshouse trials. The report recommends that these isolates should be further evaluated for potential application in the field, independently and in combination.

To read the abstract of "The potential of non-pathogenic *Fusarium oxysporum* and other biological control organisms for suppressing fusarium wilt of banana" visit: http://www.blackwell-synergy.com/doi/abs/10.1111/j.1365-3059.2006.01344.x

❖ EVENTS OF INTEREST

MEETING AND SYMPOSIA

2006

*** 6-11 August**

11th IUPAC International Congress of Pesticide Chemistry, Kobe, Japan.
Email: IUPAC2006sec@jtbcom.co.jp

*** 20-25 August**

8th International Mycological Congress, Cairus, Australia**.**
Website: ww.australasianplantpathologysociety.org.au

*** 28 August- 5 September**

International Powdery Mildew Conference, Asilomar Conference Center, Monterey, CA. Doug Gubler. E-mail: wdgubler@ucdavis.edu;
Website: www.plpnem.ucdabis.edu

*** 3-6 September**

4th Australasian Soil-borne Diseases Symposium, Queenstown, New Zealand. Contact: Helen Shrewsbury, Email: shrewbh@lincoln.ac.nz;
Webiste: http://www.asds2006.org.nz

*** 13-17 September**

IXth Meeting of the Phytopathogens Working Group, IOBC/WPRS Working Group Biological Control of Fungal and Bacterial Plant Pathogens, Spa, Belgium. E-mail: Monica.Hofte@ugent.be;
Website: www.agri.gov.il/Depts/iobcpp/iobcpp.html

*** 8-19 September**

Novel Biotechnologies for Biocontrol Agent Enhancement and Management, Gualdo Tadino, Perugia, Italy.
Email: maurizio.vurro@ispa.cnr.it;
Website: www.ispa.cnr.it/NATO-ASI

* **26-30 September**

Mycoglobe International Conference, Bari, Italy**.** Website: www.ispa.cnr.it/mycoglobe/conference/index.php?id_conf=13

*** 19-23 November**

9th Arab Congress of Plant Protection, organized by the Arab Society of Plant Protection in collaboration with the General Commission for Scientific Agricultural Research, Damascus, Syria. *For more details, please contact Dr Safaa Kumari (Email: s.kumari@cgiar.org) or Mr Jamal Mando (Email: jamalagr@mail.sy). You are also advised to see the congress website (www.9acpp-sy.org).*

2007

*** 21-25 May**

XII International IUPAC Symposium on Mycotoxins and Phycotoxins, Istanbul, Turkey.
Website: http://iupac2007-ycotoxin.atal.tubitak.gov.tr/

*** 15-18 October**

XVI International Plant Protection Congress (IPPC), Glasgow, United Kingdom.
Website: www.bcpc.org/iapps2007

2008

*** 24-29 August**

ICPP 2008, Torino, Italy, Contact: Prof. M.L. Gullino, University of Torino, Italy,
Email: marialodovica.gullino@unito.it;
Website: www.icpp2008.org

❖ PUBLICATIONS

NEW BOOKS

● **Alien Invasive Species: Impacts on Forests and Forestry: A Review.** 2005. By Beverly A. Moore. Alien invasive species occur in all major taxonomic groups from micro-organisms to mammals. The Invasive Species Specialist Group (ISSG) of the Species Survival Commission (SSC) of the World Conservation Union (IUCN) has gathered information on 326 alien invasive species including 157 that negatively impact forests and the forest sector (www.issg.org/database). ISSG has also compiled a list of the *One Hundred of the World's Worst Invasive Alien Species* (www.issg.org/database/species/search.asp?st=100ss&fr=1&sts=#SpeciesList) which aims to collectively illustrate the range of impacts caused by biological invasion. Although incomplete, this list is a first attempt to rank the impact of alien invasive species. Included are 62 alien invasive species - four fungi, one flatworm, 10 insects, two molluscs, two amphibians, one reptile, two birds, 13 mammals, two grasses, six plants and 19 trees and shrubs - that impact forests and forestry. *Working Paper FBS/8E, FAO, Rome, Italy.*

● **Colour Handbook of Diseases and Disorders of Citrus Fruits.** 2007. Edited by Antonio Azzaro, Giancarlo Polizzi, and Nigel D. Cattlin. This book covering the most important pathogens; provides clear, concise descriptions of the symptoms and cycles of diseases, their distribution and economic importance and advice on their control. The text is illustrated with over 220 superb colour photographs of affected crops to aid in the rapid identification of disease. *For more details, please see:*
http://www.blackwellpublishing.com/

● **A Colour Atlas of Postharvest Diseases of Fruits and Vegetables-Volume One**. 2007. Edited by Anna Snowdon. Now established worldwide as the standard guide to the recognition and understanding of the causes of deterioration in temperate and tropical fruits and vegetables, these superbly illustrated full-colour volumes deal clearly, concisely and systematically with each of the main diseases and disorders, emphasising those of importance to international trade. Diseases are broken down into four sections: occurrence, symptoms, biology, and control. The introductory section illustrates the diseases and disorders and the agents of those diseases. Students of plant pathology will find the technical explanations clear and the quantity of colour photographs an added benefit. Anyone involved in the commercial production, shipping, import, or marketing of fruit will find this book valuable. *For more details, please see: http://www.blackwellpublishing.com/*

● **Pests and Diseases of Potatoes.** 2006. Edited by S. Wale, and Nigel D Cattlin. Covering the most important pathogens, this handbook provides clear, concise descriptions of the symptoms and cycles of diseases, their distribution and economic importance and advice on their control. The text is illustrated with over 250 superb colour photographs of affected crops to aid in the rapid identification of diseases. The book also includes 'pest profiles' that identify with the

use of colour photographs, the pests that commonly prey on potato crops. *For more details, please see: http://www.blackwellpublishing.com/*

● **Pesticides: Health, Safety and the Environment.** 2006. Edited by G.A. Matthews. Over the last five decades pesticides have undoubtedly helped to increase agricultural production and control vectors of disease, however the environmental impact of long term agro-chemical use has been cause for concern along with the effects on human health. In Pesticide Safety Graham Matthews begins by looking at the developmental history of pesticides, and how crop protection was achieved before they were in use, how pesticides are registered for use and what happens to pesticides in food and the environment. Pesticide application and operator safety is investigated and the future of pesticides in light of the development of genetically modified crops is explored. Collecting together the most recent research in the area in a single volume, *Pesticide Safety* is a vital resource for agricultural scientists, agronomists, plant scientists, plant pathologists, entomologists, environmental scientists, public health personnel, toxicologists, crop protection personnel and all those involved in the agrochemical industry and government pesticide registration and legislation. *For more details, please see: http://www.blackwellpublishing.com/*

● **Fusarium Laboratory Manual.** 2006. Edited by John Leslie and Brett Summerell. For the first time in over 20 years, a comprehensive collection of photographs and descriptions of species in the fungal genus *Fusarium* is available. This laboratory manual provides an overview of the biology of *Fusarium* and the techniques involved in the isolation, identification and characterization of individual species and the populations in which they occur. It is the first time that genetic, morphological and molecular approaches have been incorporated into a volume devoted to *Fusarium* identification. The authors include descriptions of species, both new and old, and provide protocols for genetic, morphological and molecular identification techniques. The Fusarium *Laboratory Manual* also includes some of the evolutionary biology and population genetics thinking that has begun to inform the understanding of agriculturally important fungal pathogens. In addition to practical "how-to" protocols it also provides guidance in formulating questions and obtaining answers about this very important group of fungi. The need for as many different techniques as possible to be used in the identification and characterization process has never been greater. These approaches have applications to fungi other than those in the genus *Fusarium*. This volume presents an introduction to the genus *Fusarium*, the toxins these fungi produce and the diseases they can cause. "The *Fusarium* Laboratory Manual is a milestone in the study of the genus *Fusarium* and will help bridge the gap between morphological and phylogenetic taxonomy. It will be used by everybody dealing with *Fusarium* in the Third Millenium". *For more details, please see: http://www.blackwellpublishing.com/*

● **Aphids as Crop Pests.** 2006**.** Edited by H. van Emden and R Harrington. Aphids represent one of the world's major insect pests, causing serious economic damage to a range of temperate and tropical crops. These range from grain crops and brassicas to potato, cotton, vegetable and fruit crops. This book provides a definitive reference volume on the biology of aphids, their pest status, and how to control them. It includes approximately 30 specially commissioned chapters from world experts, principally from Europe and North America. Topics covered range from host selection and feeding to movement and dispersal, and from insecticide resistance to chemical, cultural and biological control methods. There are also several case study chapters, on integrated pest management in specific crops. *For more details, please see: http://www.cabi-publishing.org/bookshop*

● **Ecologically-Based Integrated Pest Management.** 2006**.** Edited by O. Koul and G.W. Cuperus. Integrated pest management (IPM) is a sustainable approach to manage pests through biological, cultural, physical and chemical means in order to minimize economic and environmental injury caused by such pests. Any comprehensive IPM programme requires an understanding of the ecological relationships between crops, pests, natural enemies and the environment. This book presents a series of review chapters on ecologically-based IPM. Topics covered range from the ecological effects of chemical control practices to the ecology of predator-prey and parasitoid-host systems. *For more details, please see: http://www.cabi-publishing.org/bookshop*

● **Plant Nematology.** 2006**.** Edited by R.N. Perry and M. Moens. Written by subject experts, this book provides an indispensible overview of all aspects of plant-parasitic nematodes. It begins by reviewing the basic structure and classification of nematodes, their taxonomy and phylogeny and the major groups of plant-parasitic nematodes. It moves on to cover their life cycle biology, the molecular characteristics of plant-nematode interaction and genetic engineering for resistance. The final section discusses quarantine legislation, sampling methods and management strategies including cultural schemes, the use of chemicals and resistant cultivars. *For more details, please see: http://www.cabi-publishing.org/bookshop*

● **Testing Methods for Seed-Transmitted Viruses: Principles and Protocols.** 2006. Edited by S E Albrechtsen. This practical guide covers the commonly used detection methods for seed-transmitted viruses and viroids that affect both tropical and temperate crops. It contains 25 complete step-by-step procedures for biological, serological and molecular techniques to detect and identify such viruses. Combining helpful practical notes with more detailed explanations of the principles behind the techniques, the book describes the general characteristics of seed-transmitted viral diseases and discusses outlines for the organization and interpretation of seed health assays. The techniques reviewed are also applicable to non-seed-transmitted viral agents. *For more details, please see: http://www.cabi-publishing.org/bookshop*

● **Use and Management of Insecticides, Acaricides, and Transgenic Crops.** 2006. Edited by John N. All and Michael F. Treacy. This comprehensive resource examines agricultural pest management from all angles—magnifying practical field strategies for growers and their advisors, updating them on the latest protection techniques, and preventing needless crop loss as a result of outdated pest control procedures. Fundamental approaches to understanding and using insecticides, acaricides, and transgenic crops are presented. Numerous color photographs, diagrams, information-packed tables, glossary, and an index are included. The handbook begins with a discussion of pesticide and transgenic crop regulations as well as principles for their proper and responsible use. Deployment in IPM and how insecticides, acaricides, and transgenic crops can be

blended with other control tactics is discussed. Details on the chemistry, toxicology, and general uses of the primary insecticides and acaricides in use today are covered. The user learns to choose a course of action based on a physiological approach with a thorough discussion of key commercial molecules or pathogens within each pesticide class. Also included is a comprehensive look at insecticidal transgenic crops. A discussion of the biochemical and physiological processes that lead to pest resistance provides a foundation for developing strategies to mitigate and manage resistance. The molecular biology and pharmacology of Cry gene constructs is discussed, as well as their use in crop development. Concerns over pest resistance to Bt and its favorable characteristics for evolving pest adaptation to Cry toxins are presented. The book also provides industry and user perspectives on mandated resistance management systems. One company's proactive resistance management program is examined, illustrating the ongoing effort by IPM specialists, growers, industry, universities, and the federal government to protect the technology. *For more details, please see: http://www.shopapspress.org/useandmaofin.html*

Selected Research Papers — أوراق علمية مختارة

ENTOMOLOGY AND ACAROLOGY — الحشرات والعناكب

A new pest of date palm trees (*Phoenyx dactylifera* L.): *Rynchophorus ferrugineus* (Olivier 1790) (Coleoptera: Curculionidae) in Mediterranean region of Turkey. 2005. K. Karut and C. Kazak (Turkey). Turkish Journal of Entomology (Turkey), 29(4): 295-300.

Biology of wheat stem sawfly *Cephes pygmaeus* L. (Cephidae: Hymenoptera). 2005. S.J. Jargees and A.K. Hashem (Iraq). Iraqi Journal of Agriculture (Iraq), 10(2): 89-95.

Effect of host kind and some insect growth inhibitors on larvae of *Ephestia cautella* (Walk.) and *E. calidella* (Gunee). 2005. N.M. Al-Mallah and R.R. Al-Sabie (Iraq). Iraqi Journal of Agriculture (Iraq), 10(2): 77-88.

Effect of temperature on development of immature stages of predatory bug *Orius niger* Wolff. 2005. V. Baniameri, E. Soleimannejadian and J. Mohaghegh (Iran). Applied Entomology and Phytopathology (Iran), 72(2): 17-20.

Effects of different photoperiods on some biological parameters of Indian meal moth *Plodia interpunctella* (Hubner) (Lepidoptera: Pyralidae) on fried and unfried pistachio cultivars. 2005. M. Shojaaddini, R. Farshbaf Pour Abad, K. Haddad Irani Nejad and S.A. Mohammadi (Iran). Turkish Journal of Entomology (Turkey), 29(4): 279-287.

Functional response of *Exochomus nigromaculatus* (Col.: Coccinellidae) to different densities of *Aphis nerii* and *Aphis craccivora*. 2005. A. Nazari, A. Sahragard and J. Hajizadeh (Iran). Applied Entomology and Phytopathology (Iran), 72(2): 27-30.

Genetic diversity of *Mayetiola destructor* and *Mayetiola hordei* (Diptera: Cecidomyiidae) by inter-simple sequence repeats (ISSRs). 2005. M. Mezghani Khemakhem, M. Marrakchi and H. Makni (Tunisia). African Journal of Biotechnology, 4(7): 601-606.

Influence of citrus species on male population density of oriental yellow scale insect *Aonidiella orientalis* (Newst.) with some notes on secondary host plants and natural enemies. 2005. A.N. Al-Khalidy (Iraq). Iraqi Journal of Agriculture (Iraq), 10(2): 107-112.

Investigation on the determination of the natural enemies of *Lepidosaphes pistacia* (Archangelskaya) (Homoptera: Diaspididae) on pistachio trees. 2005. I. Ozgen and Y. Karsavuran (Turkey). Turkish Journal of Entomology (Turkey), 29(4): 309-316.

Management of *Callosobruchus chinensis* Linnaeus in stored chickpea through interspecific and intraspecific predation by ants. 2006. M. Aslam, F. Asif Shaheen and A. Ayyaz (Pakistan). World Journal of Agricultural Sciences, 2(1): 85-89.

Management of *Callosobruchus chinensis* Linnaeus through use of resistance in stored chickpea varieties. 2006. M. Aslam, F. Asif Shaheen, M. Asad Abbas and A. Saba (Pakistan). World Journal of Agricultural Sciences, 2(1): 82-84.

Potential of some essential and vegetable oils in protecting stored cowpea from the cowpea beetle *"Callosobruchus maculates"*. 2005. A.M.E. Abd El-Salam (Egypt). Annals of Agricultural Science (Ain Shams Univ. Egypt), 50(1): 283-296.

The species of sunn pest (*Eurygaster* spp.) (Heteroptera: Scutelleridae) in the overwintering areas of central Anatolia region of Turkey. 2005. E. Kocak and N. Babaroglu (Turkey). Turkish Journal of Entomology (Turkey), 29(4): 301-307.

Wheat stem sawfly (*Cephus pygmaeus* L.) damage; impacts on grain yield, quality and marketing prices in Anatolia. 2005. I. Ozberk, A. Ath, A. Yucel, F. Ozberk and Y. Coskum (Turkey). Crop Protection (UK), 24(2): 1054-1060.

DISEASES — أمراض

VIRUSES — الفيروسات

A severe outbreak of melon yellow mosaic disease caused by Zucchini yellow mosaic virus in the Punjab province of Pakistan. 2006. A. H. Malik, S. Mansoor, S. Iram, R. W. Briddon and Y. Zafar (Pakistan). Plant Pathology, 55(2): 285.

Association of East African cassava mosaic virus-Uganda (EACMV-UG) with cassava mosaic disease in Sudan. 2006. G. Tadu, S. Winter, A. M. A. Gadelseed and G. A. Dafalla (Sudan). Plant Pathology (UK). 55(2): 287

Characterization of Tomato fruit yellow ring virus: a new Tospovirus species infecting tomato in Iran. 2006. S. Winter, N. Shahraeen, M. Koerbler and D.-E. Lesemann (Iran & Germany). Plant Pathology (UK), 55(2): 287.

Detection and characterization of two strains of *Grapevine fanleaf nepovirus* in Tunisia. 2005. S. Fattouch, H. Acheche, S. M'hirsi, M. Marrakchi and N. Marzouki (Tunisia). EPPO Bulletin, 35 (2) : 265-270.

First report of 16S rDNA II Group Phytoplasma on *Polygala mascatense*, a weed in Oman. 2006. S. Livingston, M.O. Al-Azri, N.A. Al-Saady, A.M. Al-Subhi and A.J. Khan (Oman). Plant Disease (USA), 90(2): 248.z

First report of *Tomato chlorosis virus* in Lebanon. 2006. Y. Abou-Jawdah, C. El Mohtar, H. Atamian and H. Sobh (Lebanon). Plant Disease (USA), 90(3): 378.

First report of *Tomato leaf curl New Delhi virus* infecting bitter gourd in Pakistan. 2005. M. Tahir and M.S. Haider (Pakistan). Plant Pathology (UK), 54(6): 807.

First report of Tomato leaf curl New Delhi virus infecting Eclipta prostrata in Pakistan. 2006. M. S. Haider, M. Tahir, S. Latif and R. W. Briddon (Pakistan). Plant Pathology (UK), 55(2): 285.

Genetics of resistance to Cotton leaf curl disease in *Gossypium hirsutum*. 2005. M. Rahman, D. Hussain, T.A. Malik and Y. Zafar (Pakistan). Plant Pathology (UK), 54 (6): 764-772.

Identification of pepper viruses by DAS-ELISA assays in Gaziantep-Turkey. 2006. M. Ozaslan, B. Bas, T. Aytekin and Z. Sigirci (Turkey). Plant Pathology Journal, 5(1): 11-14, 2006.

Occurrence of *Cauliflower mosaic virus* in different cruciferous plants in Iran. 2005. Sh. Farzadfar, R. Pourrahim, A.R. Golnaraghi, and A. Ahoonmanesh (Iran). Plant Pathology (UK), 54(6): 810.

Occurrence of grapevine declines and first report of black dead Arm associated with *Botryosphaeria obtuse* in Lebanon. 2006. E. Choueiri, F. Jreijiri, P. Chlela, G. Louvet and P. Lecomte (Lebanon & France). Plant Disease (USA), 90: 115.

FUNGI الفطور

A study of powdery mildews (Erysiphaceae) on some host plants of cucurbitaceae. 2005. N. Ali (Syria). Tishreen University Journal for Studies and Scientific Research - Biological Sciences Series (Syria), 27(1): 83-90.

Antifungal activity of medicinal plants from Jordan environment. 2005. Amjad B. Khalil, Basem F. Dabaneh and Ghandi H. Anfoka (Jordan). Plant Pathology Journal, 4(2): 130-132.

Antifunal activity of volatile components extracted from leaves, stems and flowers of four plants growing in Tunisia. 2005. N. Boughalleb, N. Bebbabi, H. Ben Jannet, Z. Mighri and M. El-Mahjoub (Tunisia). Phytopathologia Mediterranea (Italy), 44: 307-312.

Comparative growth and pathogenicity of geographical isolates of *Sclerotinia sclerotiorum* on lentil genotypes. 2006. C. Akem, M. Bellar and B. Bayaa (Syria). Plant Pathology Journal, 5(1): 67-71.

Effect of temperature on *Verticillium* wilts of tomato in Tunisia. 2006. H. Jabnoun-Khiareddine, M. Daami-Remadi, K. Hibar, J. Robb and M. El Mahjoub (Tunisia). Plant Pathology Journal, 5(1): 1-6.

Emergence in Tunisia of new pathotypes of *Verticillium tricorpus* able to attack tomato, aubergine and potato. 2005. H. Jabnonu-Khiareddine, M. Daami-Remadi and M. El-Mahjoub (Tunisia). EPPO Bulletin, 35(3): 497-503.

First report of *Bipolaris sacchari* causing wheat stem-base disease in Iran. 2006. M.I. Soleimani and S. Kazemi (Iran). Plant Pathology (UK), 55(2): 305.

Genetic diversity of some Tunisia *Botrytis cinerea* isolates using molecular markers. 2005. D. Ben Ahmed and W. Hamada (Tunisia). Phytopathologia Mediterranea (Itay), 44: 300-306.

Genotypic identification for some *Fusarium sambucinum* strains isolated from wheat in upper Egypt. 2006. Jamal S.M. Sabir (Saudi Arabic). World Journal of Agricultural Sciences, 2(1): 6-10.

Identification of wheat leaf rust (*Puccinia recondite* f. sp. *Tritici*) pathotypes in Mazandaran and Golestan province. 2005. S. Mahdian and M. Dehghan (Iran). Applied Entomology and Phytopathology (Iran), 72(2): 9-12.

Virus diseases of cucurbits in Gaziantep-Turkey. 2006. M. Ozaslan, T. Aytekin, B. Bas, I. Halil Kilic, I. Didem Afacan and D.S. Dag (Turkey). Plant Pathology Journal, 5(1): 24-27.

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