ARAB AND NEAR EAST
PLANT PROTECTION NEWSLETTER

The Arab and Near East Plant Protection Newsletter (ANEPPNEL) is jointly published twice a year by the Arab Society for Plant Protection and the Near East Regional Office of the FAO. All correspondence should be sent either to Editorial Assistant, Arab Society for Plant Protection, P.O. Box 113-6057, Beirut, Lebanon (website: www.asplantprotection.org; e-mail: aspp@terra.net.lb).

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Number 43, December 2006

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EDITORIAL

ARAB SOCIETY FOR PLANT PROTECTION: 25 YEARS OF CONTINUED PROGRESS

It was a hope, a wish .....and a dream.

During the 9th Arab Congress of Plant Protection held in Damascus, Syria, November 19-23, 2006, the Arab Society for Plant Protection (ASPP) celebrated its Silver Jubilee. As one of the group who started this ambitious undertaking, my memory cells scanned the past 25 years, trying to spot accomplishments and failures and from there try to reflect on the future.

It all started during the summer of 1997, when I was invited to give a Nematology course to the graduate students at the Faculty of Agricultural and Food Sciences, American University of Beirut. Looking back, it seems as if I was destined to meet with Drs. Khaled Makkouk, Abdelrahman Saghir, Adib Saad and Nasri Kawar. We met one day and shared our aspirations to establish an independent scientific society of plant protection in the Arab world. It did not take long for the group to decide that we need to make a move and invite all those who are interested in the idea to an initiation meeting. The late Dr. Ghazi El-Hariri, then the Dean of the Faculty of Agriculture at the University of Aleppo, took the lead and hosted a meeting in Aleppo to discuss the idea and develop the Society by-laws. Around 80 plant protection scientists from most Arab countries met at the University of Aleppo for three days and produced the draft by-laws of the Arab Society for Plant Protection. There was a general agreement that ASPP should organize a congress every three years, and that what exactly happened in the years that followed. The first congress was held in Amman (Jordan) in 1982, followed by congresses in Damascus (Syria), El-Ain (UAE), Cairo (Egypt), Fes (Morocco), Beirut (Lebanon), Amman (Jordan, for the second time), El-Beida (Libya) and lastly in Damascus (Syria, for the second time).

The Society membership grew to include thousands of active members or supporters to its activities, including institutions, ministries, universities and the public sector, with financial support from national, regional and international organizations and private companies. Membership and activities covered almost all Arab countries, through the regular congresses, workshops and seminars organized by the Society alone or in collaboration with other institutions. The Society presence was also felt through the publication, without interruption, of its refereed journal (24 volumes already published) and newsletter (42 issues already published). In addition, the Society was able to own an office for its secretariat in Beirut, Lebanon.

Those of us, who grew with the Society activities from the early beginning, can witness how much progress has been achieved in the quality of research and the way it is presented (oral or poster) in the successive congresses. Similarly, the quality of research papers published in the Arab Journal of Plant Protection has improved steadily. In addition, ASPP in all its congresses insisted on inviting well known speakers from all over the world (including the Arab region) to give presentations in specific symposia focusing on plant protection issues of significant importance to the Arab countries. This permitted a positive interaction among scientists at the regional and global levels.

In a study I conducted recently about regional scientific societies in the Arab World, I found that tens of societies covering different scientific disciplines are officially registered, but there are only four scientific societies that consistently organize scientific meetings at regular intervals and publish regularly refereed journals, and one of these four is the Arab Society for Plant Protection.

Thus, the dream became a reality, and this was possible because of the interest and dedication of the Society founders coupled with the interest and support of hundreds of scientists who truly believed in its mission and objectives. The road for the young generation of scientists is now paved and it is up to them to bring ASPP into new heights. For other scientific disciplines in the Arab World, we are proud to say that there is an existing and successful model to follow.

Walid Abu- Gharbieh (Amman, Jordan)

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

CYPRUS

First Report of *Tomato chlorosis virus* on Tomato Crops in Cyprus. In the summer of 2004, yellowing symptoms similar to those caused by nitrogen and/or magnesium deficiency were observed in field- and glasshouse-grown tomatoes (*Lycopersicon esculentum*), in the Parekklisia area of Cyprus. Initially, lower leaves showed extensive interveinal yellowing with necrotic flecks, brittleness and occasional upward leaf rolling, before finally the whole plant turned yellow. Similar symptoms were observed during 2005 in glasshouse tomatoes grown in areas located on the southwest coastal region of the island. The abundance of whiteflies on the affected plants suggested the involvement of the whitefly-transmitted *Tomato chlorosis virus* (ToCV) and/or *Tomato infectious chlorosis virus* (TICV), both of the genus *Crinivirus*. Leaves of 18 affected plants were collected, total RNA was isolated and RT-PCR was performed in a single tube using primers HS-11 and HS-12, followed by a multiplex nested-PCR with primers TIC-3/TIC-4 and ToC-5/ToC-6, for the detection of TICV and ToCV, respectively. A PCR product of 463 bp, corresponding to the HSP 70 gene of ToCV, was amplified for all tested samples. The sequences of four cloned PCR products were identical (EMBL accession number AM158958) and showed 99% nucleotide identity to a ToCV isolate from Florida (accession number AY903448). ToCV is vectored by *Bemisia tabaci* (*biotypes A* and *B*), *Trialeurodes vaporariorum* and *T. abutilonea*. Although there have been no systematic studies on whitefly incidence and distribution in Cyprus, it seems that *B. tabaci* is the predominant species present, as *Tomato yellow leaf curl virus* and *Cucurbit yellow stunting disorder virus*, vectored by this species, are prevalent in tomatoes and cucurbit crops, respectively. On the other hand, the incidence of *Beet pseudo-yellows virus* (transmitted by *T. vaporariorum*) is much lower. This is the first report of ToCV in Cyprus. [L. C. Papayiannis, N. Ioannou (Cyprus), C. I. Dovas (Thessaloniki), V. I. Maliogka and N. I. Katis (Greece). Plant Pathology, 55(4): 567, 2006].

EGYPT

First Report of *Septoria pistaciae* Causing Leaf Spot of Pistachio in Egypt. In May 2006, leaf spots were observed on approximately 60% of 8-year-old pistachio (*Pistacia vera* L.) trees in an orchard located at Rhafah, north of Sinai, Egypt. These spots were typically circular, or occasionally irregular, with white-to-light tan or gray centers and a purple or brown border measuring 1 to 5 mm in diameter, or occasionally larger on the upper leaf surface. A narrow, brown border surrounded the spot, and with age, the lesion cracked. Spots occasionally turned brown and closed to form blotches. Fungal isolates from the leaf spots were identified as *Septoria pistaciae* on the basis of characteristics of pycnidia and conidia. From the leaf spots, numerous black pycnidia were found that produced hyaline conidia, 3 to 7 septate, generally filiform although tapering at one end, and measuring 46 to 75 × 3 to 4 µm. Pycnidia were dark, separate, globe shaped with an ostiole from which conidia were extruded, and erupted through the surface of infected plant tissue. Conidia were produced on short conidiophores. Single conidial isolations onto 2% malt agar consistently formed slow-growing, dark green colonies. To confirm the pathogenicity of the isolate of *S. pistaciae*, a suspension of 5 × 10(^5) conidia per ml in water was applied at 1 ml per leaf to 20 leaves of 10 rooted cuttings of pistachio trees in 30-cm pots. Ten controls were misted with water only. All plants were covered with plastic bags for 48 h on a greenhouse bench. Greenhouse temperatures ranged from 15 to 20°C with a 16-h photoperiod. After 6 days, all inoculated plants developed symptoms, and the fungus was reisolated from lesions. No symptoms were observed on control plants. *S. pistaciae* was previously reported on pistachio in Texas and Arizona. Reports included mention of its occurrence in the United States (California), Asia (Armenia Republic of Georgia, India, Israel, Kazakhstan, Kirgizstan, Syria, Turkey, Turkmenistan, and Uzbekistan), and Europe (Albania, France, Greece, Italy, and Portugal). To our knowledge, this is the first report of Septoria leaf spots of pistachio in Egypt. [Waffa M. Haggag, M. S. M. Abou Rayya and N. E. Kasim (Egypt). Plant Disease, 90: 1553, 2006].

IRAN

Characterization of A New Almond Witches' Broom Phytoplasma in Iran. Almond witches' broom (AlmWB) is a destructive disease in several provinces in Iran. Association of phytoplasma with the disease has been established previously. In the present work two phytoplasmas from Khafr (KAlmWB) and Neyriz (NAlmWB) in the Fars Province were compared by biological and molecular analysis. Both infected bitter almond, wild almond, peach and nectarine but not apple and pear, by grafting. In bitter almond the symptoms induced by KAlmWB consisted of severe proliferation, internode shortening and leaf size reduction. In contrast, NAlmWB caused leaf necrosis, dieback and death. KAlmWB was transmitted to periwinkle and eggplant and from experimentally infected periwinkle to almond by dodder. It was also transmitted from eggplant to eggplant, ornamental eggplant and tomato by grafting. Under similar test conditions, NAlmWB was not transmitted to herbaceous plants by dodder. Phylogenetic analysis of 16S–23S rDNA spacer region (SR) sequences placed both strains in the pigeon pea witches' broom (PPWB) group. However, based on phylogenetic and putative restriction site analyses and sequence homology, NAlmWB was identical with the Lebanese AlmWB phytoplasma, while KAlmWB was closer to the *Knautia arvensis* phyllody (KAP) agent. On the basis of host range, dodder transmission, symptomatology and molecular analyses of 16S rDNA and SR, two different phytoplasmas related to PPWB group were associated with AlmWB disease in Iran. KAlmWB phytoplasma is being reported as a new phytoplasma of AlmWB disease. (M. Salehi, K. Izadpanah and J. Heydarnejad (Iran). Journal of Phytopathology, 154(7-8): 386-391, 2006].

***Erwinia amylovora* Causing Fire Blight of Pear in the Guilan Province of Iran.** Fire blight, caused by *Erwinia amylovora*, is one of the important bacterial diseases of pear trees. It causes blight of different organs of the tree (blossoms, shoots, leaves, fruits, and limbs) and production of exudates. During a survey of pear orchards in different

areas of the Iranian province of Guilan (Astaneh, Ashrafieh, Lahijan, and Kiashahr) necrotic shoots and exudates were observed in apple and pear trees. Samples taken from infected tissues were crushed in peptone water and aliquots of 100 µl of the extract were cultured on nutrient agar (NA) and LB containing cycloheximide (50 µg ml^{-1}). A rod-shaped, gram negative, facultative anaerobic bacterium was consistently isolated, which produced levan in sucrose media but not fluorescent pigment in King's B medium. All isolates induced hypersensitive reaction (HR) in tobacco and geranium leaves, were oxidase, nitrate, urease, and indole negative, could not rot potato tuber slices, produced H_2S, and grew at 36°C. The isolates could utilize citrate, arabinose, sorbitol, galactose, and trehalose as carbon source and their gelatin test was positive. Based on morphological, biochemical and physiological characters, and PCR amplification with specific primers, most bacterial isolates were identified as *E. amylovora*. Some isolates from spear orchards were identified as *Pseudomonas syringae* pv. *syringae*. This is the first report of the occurrence of *E. amylovora* on pear trees in the province of Guilan. [M. Niknejad Kazempour, E. Kamran and B. Ali (Iran), Journal of Plant Pathology, 88 (1), 2006].

First Report of *Pratylenchus neglectus* and *P. thornei* Infecting Canola and Weeds in Iran. Cultivation of canola (*Brassica napus* L.) is relatively new in Iran. Because nearly 90% of Iran's edible oil is imported, farmers are subsidized and encouraged to grow this crop. Except for the sugar beet cyst nematode, *Heterodera schachtii*, to which susceptibility of some canola cultivars has been established, information on other nematode pests of canola is lacking. During a survey from April–May 2002 and repeated in 2003, soil and root samples of winter canola and weeds were collected at harvest of canola from research stations and farmers' fields in the south, west, and northwest of Tehran Province. Each sample was a composite of 25 roots and 2 kg of soil per hectare, collected from the rhizosphere of canola with a 2.5-cm-diameter soil corer. Samples were put in plastic bags and kept at 5°C until they were processed, within 2 weeks from sampling. Samples were sieved through a 0.840-cm aperture sieve and mixed thoroughly. Nematodes were extracted from subsamples of 5 g of roots and 250 g of soil with a modification of the sugar centrifugal flotation method, counted, and identified. Two species of root lesion nematodes, *Pratylenchus neglectus* and *P. thornei*, were found. When they were present in the same field, they occurred in the roots of both Regents × Cobra and Orient cultivars. Averages of 28 and 321 *P. thornei* per gram were found in the roots of cvs. Regents × Cobra and Orient, respectively. Averages of 30, 1,026, 626, and 450 *P. neglectus* per gram of roots of cvs. Regents × Cobra, Orient, Ocapi, and GLSIO were detected, respectively, in different fields. Heavily infected plants were stunted and had roots with dark lesions, a symptom typical of the attacks by these nematodes. Generally, greater nematode densities were in the roots than in the soil and both nematode species were more abundant in cooler than in warmer areas of the province. Since these nematodes are also severe pests of wheat, which is also grown in the province, they could pose a potential threat to both crops. Weeds that were present in the sampled fields belonged to the botanical families Scrophulariaceae, Gramineae, Euphorbiaceae, Crucifereae, and Compositeae. Between 22 and 1,500 *P. thornei* and 17 *P. neglectus* per gram of roots of Crucifereae and 280 *P. thornei* per gram of roots of Gramineae were found. To our knowledge, this is the first report of lesion nematodes infecting canola plants in Iran. [S. Fatemy, E. Abootorabi, N. Ebrahimi, and F. Aghabeigi (Iran). Plant Disease, 90: 1555, 2006].

LEBANON

Occurrence of *Xiphinema index* in Lebanese Vineyards. Soil samples were collected in late spring 2005 from vineyards in 25 different locations of the Bekaa valley, the main grapevine-growing area of Lebanon, to investigate the presence of the longidorid nematode *Xiphinema index* Thorne & Allen, the vector of Grapevine fanleaf virus (GFLV). Approximately 14% of the samples contained the nematode, which was found in all developmental stages except for males, which are very rare in this species. The density of the nematode population ranged from 8 to 45 specimens/500 ml of soil. The main morphological characteristics of taxonomic relevance in the Lebanese population of *X. index* are described, while selected morphometric parameters from a population of 18 specimens were compared with those reported in the literature. This is the first survey for the presence and distribution of *X. index* in Lebanon. [J. Jawhar (Lebanon), N. Vovlas and M. Digiaro (Italy). Journal of Plant Pathology, 88 (1): 117-119, 2006].

OMAN

First Report of a Group 16SrII Phytoplasma Infecting Chickpea in Oman. Chickpea (*Cicer arietinum*), locally known as "Dungo", is grown for legume and animal feed mainly in the interior region of Oman. During February 2006, survey samples of chickpea leaves from plants showing yellows disease symptoms that included phyllody and little leaf were collected from the Nizwa Region (175 km south of Muscat). Total nucleic acid was extracted from asymptomatic and symptomatic chickpea leaves using a cetyltrimethylammoniumbromide method with modifications. All leaf samples from eight symptomatic plants consistently tested positive using a polymerase chain reaction assay (PCR) with phytoplasma universal primers (P1/P7) that amplify a 1.8-kb phytoplasma rDNA product and followed by nested PCR with R16F2n/R16R2 primers yielding a product of 1.2 kb. No PCR products were evident when DNA extracted from healthy plants was used as template. Restriction fragment length polymorphism analysis of nested PCR products by separate digestion with *Tru*9I, *Hae*III, *Hpa*II, *Alu*I, *Taq*I, *Hha*I, and *Rsa*I restriction enzymes revealed that a phytoplasma belonging to group 16SrII peanut witches'-broom group was associated with chickpea phyllody and little leaf disease in Oman. Restriction profiles of chickpea phytoplasma were identical with those of alfalfa witches'-broom phytoplasma, a known subgroup 16SrII-B strain. To our knowledge, this is the first report of phytoplasma infecting chickpea crops in Oman. [N. A. Al-Saady, A. M. Al-Subhi, A. Al-Nabhani and A. J. Khan (Oman). Plant Disease, 90: 973, 2006].

First Report of *Puccinia sorghi* on Maize in Oman. Maize (*Zea mays* L.) is an important annual forage crop cultivated in the Sultanate of Oman, especially during the summer months. It is used for green fodder and grains and often intercropped in fruit orchards, especially under date palms. In April of 2005, leaf samples showing rust symptoms were collected from Samail, 100 km south of Muscat. Oval-shaped, red-brown pustules covered both sides of the leaves

and yielded urediniospores typical of *Puccinia sorghi* Schwein. Urediniospores were roughly subglobose, measured 23 to 28 × 20 to 25 µm, echinulate, with three or four equitorial germ pores. Teliospores (38 to 42 × 16 to 19 µm) were observed, but few in numbers, most probably because of the time of year of collection. Pathogen identity was confirmed by nuclear ribosomal large subunit (28S) and internal transcribed spacer region 2 (ITS's-2) DNA analyses (voucher sequence deposited in GenBank, Accession No. DQ345724, voucher specimen deposited in the U.S. National Fungus Collections, BPI 871134). *P. sorghi* has previously been reported from Yemen and Saudi Arabia but not from Oman. Maize is grown throughout the year in Oman, and pathogen survival probably does not require the presence of the alternate host, nonetheless, *Oxalis* species are present and current research is attempting to locate and confirm the presence of the aecial stage in Oman. [M. L. Deadman, A. Al Sa'di, Y. Al Maqbali, S. Livingston (Oman) and M. C. Aime (USA). Plant Disease, 90: 826, 2006].

PAKISTAN

First Report of Cotton leaf Curl Disease in Central and Southern Sindh Province in Pakistan. Cotton leaf curl is a devastating disease of cotton that has resulted in severe losses (estimated at more than US$87 million per annum) in Pakistan. The epidemic is centered in Punjab, the province that contributes approximately 80% of Pakistan's cotton. Previously, the disease had been observed sporadically on single plants in the northern Sindh Province but did not cause economically significant damage. During the years 2004 and 2005, a high incidence (approximately 20%) of the disease was observed in Shahdadpur and parts of District Sanghar, located in central Sindh Province. The disease was also observed at low incidence (<1%) in southern Sindh. To confirm the identity of the causal agent of the disease, 18 samples from three districts in central southern Sindh (Sanghar, Hala, and Hyderabad) were collected, and total DNA was extracted using cetyltrimethylammoniumbromide. Universal primers for begomoviruses based on conserved sequences as follows were used in polymerase chain reaction (PCR): BegomoF: (5'-CCGTGCTGCTGCCCCCATTGTC CGCGTCAC-3') and BegomoR: (5'-CTGCCACAACCATG GATTCACGCACAGGG-3'). Universal primers for amplification of DNA beta with PCR were also used. A full-length clone of *Cotton leaf curl Multan virus* (CLCuMV) was labeled with alpha-(^32)PdCTP by the oligo-labeling method and used as a probe in Southern hybridization for the detection of geminivirus DNA forms. Similarly, cotton leaf curl disease associated DNA beta was also labeled and used as a probe in Southern hybridization. The use of universal primers for begomoviruses resulted in amplification of viral DNA of the expected size from all samples while no PCR product was obtained from healthy plants. PCR results confirmed that all plants were infected with begomoviruses. Southern hybridization with CLCuMV and DNA beta probes detected begomovirus DNA forms associated with virus replication when washed at medium stringency, further confirming that the plants were infected with the cotton leaf curl geminivirus complex. Our results indicate that cotton leaf curl complex has become established in central and southern districts of Sindh Province and it poses a major threat to cotton grown in the region. [S. Mansoor, L. Amrao, I. Amin, R. W. Briddon, K. A. Malik, and Y. Zafar (Pakistan). Plant Disease, 90: 826, 2006].

SYRIA

Two Unusual Species of Aphids Attacked Apples in As-Sweida, Syria. As a result of the warm winter prevailed east of the Mediterranean this year, unusual aphid species (Homoptera: Aphididae) appeared on the terminal shoots and growing leaves of apple trees in spring in Al-Arab Mountain, As-Sweida, Syria. Samples from those aphids were collected and identified according to CABI TAXAKEY Aphids CD. Two unusual aphid species were recorded on apple, black bean aphid, *Aphis fabae* Scopoli, and cotton aphid, *Aphis gossypii* Glover. This is likely, the first record of these species on apple trees in Syria, including As-Sweida, and it is not common on apple in the world. In addition, two other common aphids: Rossy apple aphid *Dysaphis plantaginea* Passerini and Apple aphid *Aphis pomi* (De Geer) were also recorded on apple this year. *D. plantaginea* was rare in commercial apple orchards during the previous years in the study area. Except their ability to transmit plant-viruses transmit (*A. gossypii*) or causing some fruit deformation (*D. plantaginea*), these aphid species didn't cause important damage on apple, because they disappeared quickly following exceptional high temperatures that dominated at the end of May and beginning of June, in addition to control measures that farmers applied to manage the key pests in apple orchards in that region: codling moth *Cydia pomonella* L. and woolly apple aphid *Eriosoma lanigerum* (Hausm.). (Wa'el Almatni, Head of Pest Management Division, Department of Plant Protection, Ministry of Agriculture, Damascus, Syria, Email: almatni@scs-net.org).

Viruses of Pome Fruit Trees in Syria. A survey was conducted to evaluate the sanitary status of pome fruit trees in Syria during spring 2003 and 2004 in 6 governorates: Damascus, Al-Qunaitara and Al-Sweida (Southern region), Homs and Hama (Central region) and Latakia (Costal Western region), as the main production areas of pome fruits. Leaf samples from 1077 apples, 54 pears and 14 quince trees were tested by ELISA for the presence of *Apple chlorotic leaf spot virus* (ACLSV), *Apple stem grooving virus* (ASGV) and *Apple mosaic virus* (ApMV) collected from 70 commercial orchards and 3 varietal collections. Results showed that the virus infection rates were 34 and 2% in apple and pear, respectively. Quince trees were found to be virus tested free. ACLSV was prevailing on apple with 34%, whereas ASGV and ApMV were found in 2 and 0.2% of tested trees, respectively. Pear trees were infected only with ACLSV (2%). 21 apples and 15 pears representative budwood samples were indexed by grafting on the following indicators: (i) *Malus pumila* cvs. Virginia Crab and Radiant for apple and (ii) *M. pumila* cv. V. Crab and *Pyrus communis* cv. Nouveau Poiteau for pear. The virus infection rates by woody indexing were much higher than ELISA, *Apple stem pitting virus* (ASPV) and ASGV were found in 86 and 82% of apple tested samples, whereas they were 80 and 60% of pear tested samples, respectively. Additional RT-PCR testing carried out for a limited number of samples confirmed the high incidence of ACLSV ASPV, ASGV and the presence of ApMV. This is the first report on pome fruit viruses in Syria, indicating an unsatisfactory sanitary status of the industry. As a consequence, a certification program is recommended for producing locally healthy propagating material. [F. Ismaeil, K. Al-Jabor (Syria), A. Myrta (Italy), M. J. Mando, E. Al-Saadoun (Syria), M. Hassan (Czechia) and S. Al-Chaabi (Syria). EPPO Bulletin, 36 (1): 65-68, 2006].

TUNISIA

First report of *Verticillium dahliae* race 2 in Tunisia. Vascular wilt diseases have recently become a serious problem on tomato (*Lycopersicon esculentum*) throughout the Tunisian Sahel. Since 2002, plants of cv. Colibri with symptoms characteristic of *Verticillium* infection (wilting, yellowing, stunting and dark brown vascular discoloration) have been seen in many greenhouses in the Chott Mariem region. Isolates from diseased plants were identified as *Verticillium dahliae* on the basis of microsclerotium production. Cultivar Colibri carries a single dominant gene (*Ve*) conferring resistance to race 1 of *V. dahliae*. This resistance has been effective for over 20 years. Wilt caused by *V. dahliae* has also been confirmed in several other resistant cultivars (e.g. Amel, Cenkara, Rio Grande). Fifty-one Tunisian isolates were tested to determine their race, with Canadian and Israeli race 1 and 2 isolates (one each) included as controls. Conidial suspensions of 10^7 conidia ml^{-1} were used to inoculate plants of the cvs Ventura and Sun 6200 (susceptible to both races), and Rio Grande, Colibri and Naya (resistant to race 1), at the two-leaf stage by root dipping. Seedlings were replanted into a sterile 2:1 mixture of peat/perlite (v/v) and maintained in a growth chamber at 23±3°C. Equal numbers of plants of each cultivar were dipped into water as controls. The experimental design was a completely randomized type with ten replicates (pots). Tests were conducted twice. Susceptible plants developed typical symptoms of wilt as above, starting two to three weeks after inoculation, followed by plant death. Race 1 isolates gave either no or only very mild symptoms in the resistant cultivars. Control plants showed no symptoms. In cultivars where infection occurred, most plants developed typical symptoms. *V. dahliae* was recovered by *in vitro* isolation and incubation from all plants with symptoms. Based on the differential reactions of the five cultivars, 10 isolates were classified as race 1 and 41 as race 2. The appearance of *V. dahliae* race 2 in tomatoes in Tunisia poses a major threat to this crop, particularly in protected cultivation where no rotations are used and the absence of soil disinfection favours the build-up of soil-borne inoculum. Race 2 has been reported from southern Europe, North and South America and North and South Africa, but this is the first report from Tunisia. [M. Daami-Remadi, H. Jabnoun-Khiareddine (Tunisia), D. J. Barbara (UK), F. Ayed and M. El Mahjoub (Tunisia). Plant Pathology, 55 (6): 816-816, 2006].

TURKEY

Occurrence of Bacterial Fruit Blotch of Watermelon Caused by *Acidovorax avenae* subsp. *citrulli* in the Eastern Mediterranean Region of Turkey. Turkey has the second highest production level of watermelon (*Citrullus lanatus* L.) in the world, with 3.8 million tons produced in 2005. In the spring of 2005, a severe outbreak of a disease resembling bacterial fruit blotch was observed on watermelon cv. Crispy growing in a production area of 35,000 ha in Adana Province in the eastern Mediterranean Region of Turkey. In 13 commercial watermelon fields surveyed in this study, incidence of symptomatic fruit ranged from 30 to 45%. Characteristic symptoms were dark, gray-green stains or blotches on the surface of fruits. Cracks developed in the rind and released an amber-colored substance. Bacteria were consistently isolated from affected fruits and they formed nonfluorescent colonies on King's medium B.. All strains were oxidase positive, gram negative, arginine dyhydrolase negative, and produced a hypersensitive response on tobacco leaves (*Nicotiana tabacum* cv. Samsun). Strains were identified as *Acidovorax avenae* subsp. *citrulli* on the basis of the results of biochemical tests and sole carbon substrate utilization (BIOLOG GN; Biolog Inc., Hayward, CA) with 75 to 93% similarity indices. A pathogenicity test was performed for nine identified strains by injecting a bacterial suspension (10(^8) CFU/ml of saline) under the rind of three harvested watermelon (cv. Diyarbakir) fruits and into the stems of three seedlings. Saline was used as the negative control. The fruits and seedlings inoculated with each strain were incubated in polyethylene bags for 48 h at 25°C. Dark green water-soaked lesions developed on inoculated fruits and water-soaking and stem necrosis were observed on the seedlings 3 to 5 days after inoculation. The bacterium was readily reisolated from inoculated fruits and seedlings and identified as *A. avenae* subsp. *citruli* on the basis of BIOLOG GN. In 1995, bacterial fruit blotch of watermelon has been observed and eradicated in the Marmara Region of western Turkey. Therefore, to our knowledge, this is the first outbreak of bacterial fruit blotch on watermelon in the eastern Mediterranean Region of Turkey. [M. Mirik, Y. Aysan and F. Sahin (Turkey). Plant Disease, 90: 829, 2006].

RESEARCH HIGHLIGHTS

EGYPT

***Agistemus exsertus* Gonzalez (Acari: Stigmaeidae) as a Predator of two Scale Insects of the Family Diaspididae (Homoptera: Diaspididae).** The predacious mite *Agistemus exsertus* Gonzalez completed its life-span when fed on eggs and crawlers of the Florida red scale *Chrysomphalus ficus* Ashmead and the white date scale *Parlatoria blanchardi* (Targioni). The development was faster when individuals were maintained on eggs and crawlers of *C. ficus*, compared with both stages of *P. blanchardi*. The average number of eggs/female/day was 2.5 and 1.1 on eggs and crawlers *of C. ficus*, respectively. Eggs and crawlers of *P. blanchardi* were an unsuitable food for egg laying for *A. exsertus*. Life table parameters showed that *A. exsertus* preferred eggs of *C. ficus* to the crawlers as prey. The population of the predator feeding on eggs and crawlers of Florida red scale multiplied 45 and 7 times in a generation time of 23 and 20.5 days, respectively. Under these conditions, the intrinsic rate of increase (r_m) was (0.17 and 0.098) individuals/female/day on eggs and crawlers of *C. ficus*, while the finite rate of increase (λ) was (1.18 and 1.11) on both stages of *C. ficus*. [Sawsn El-Sawi and Faten Momen (Egypt). Archives of Phytopathology and Plant Protection, 39(6): 421-427, 2006].

Biological Control of the Leafminer, *Liriomyza trifolii* by Introduction, Releasing, Evaluation of the Parasitoids *Diglyphus isaea* and *Dacnusa sibirica* on Vegetables Crops in Greenhouses in Egypt. The serpentine leafminer, *Liriomyza trifolii* (Burgess) (Diptera: Agromyzidae), is one of the most serious pests of various floricultural and vegetable crops. The European strains of the parasitoids *Diglyphus isaea* (Walker) (Hymenoptera: Eulophidae) and *Dacnusa sibirica* Telenga (Hymenoptera: Braconidae) were imported from The Netherlands. A total of 90,000 of these parasitoids were reared and released on cucumber and tomato

in greenhouses. The parasitism rates of *D. sibirica* reached maximum 11.6% and 7.2% in the 11th week from the releasing date, on cucumber and tomato, respectively. Also the parasitism rates of the European strain of *D. isaea* increased until it reached a maximum 2.1% and 1.4%, in the tenth week from the releasing date on cucumber and tomato, respectively. It is concluded that the parasitoids *D. sibirica* and the European strain of *D. isaea* can be established in Egypt. [Shaaban Abd-Rabou (Egypt). Archives of Phytopathology and Plant Protection, 39(6): 439-443, 2006].

Control of Postharvest Decay of Tomato Fruits with Acetic Acid Fumigation Treatment. Fumigation with acetic acid (AA) vapour was applied for controlling tomato fruit rots caused by *Alternaria alternata, Aspergillus niger, Botrytis cinerea* and *Penicillium expansum.* All the tested concentrations i.e. 5, 10, 20 and 25% of AA when applied for 1h at l3°C have significantly reduced the percentage of fruits infected areas as compared with control. At the highest concentration i.e. 25 % of AA, the maximum effect was on fruits inoculated with *A. niger* (8.3%) followed by *B. cinerea* (16.2 %) and *P. expansum* (16.4 %). while, *A. alternata* fruit rot was the least sensitive(36.7%) as compared with control (100%). In other experiment, AA concentration was raised to 30% and inoculated fruits were fumigated at 13°C for different time of exposure i.e. 1, 2, and 3 h. The decay caused by *A. niger* was completely prevented at all tested exposure times. Meantime, the same results were recorded with *A. alternata* and *P. expansum* rots at 2 and 3 h of exposure. Results show that the potentiality of fumigation with AA to control tomato postharvest decay appears promising. [S.T. Sbehata (Egypt). Annals Agricultural Science, Ain Shams University, Cairo (Egypt), 51(1): 235-245, 2006].

Transgene-mediated RNA Silencing of TYLCV Genes Affecting the Accumulation of Viral DNA in Plants. Post-transcriptional gene silencing (PTGS) is a nucleotide sequence specific RNA turnover mechanism produced by plant cell as a natural mechanism against virus infection. Double strands of short (21-25 nt) interference RNA (siRNA) mediate this natural defense mechanism The PTGS mechanism is becoming powerful tools for reducing expression of a certain viral gene and controlling infection. In the purpose of controlling the tomato yellow leaf curl virus (1YLCV), three regions from theviral genome located in the overlap regions between C1/C2, C2/C3 and V1/V2 were used for studying their efficiency in working as siRNA to target viral DNA accumulation in plant cells. Constructs were prepared by cloning each of the three regions both in the sense or sense/antisense directions in the binary vector pFGC5941 and introduced into tomato and tobacco plant tissues via Agro-infiltration technique. Additional construct containing the three regions together in the sense/antisense directions was also used as a control to prove that either one of the selected regions may activate the siRNA mechanism. All plants were challenged with virus using the TYLCV-Eg infectious clone 10 days post infiltration. The obtained results revealed that only sense/antisense constructs inhibit or reduce accumulation of viral genome due to the induction of siRNA mechanism. However, infiltered plants with the construct containing the as Cl/C2 region proved to be the best region for initiating PTGS as it inhibited the accumulation of the viral genome completely as well as it prevented the appearance of viral symptoms in all tested plants. This may be due to its role in silencing the expression of two very important viral genes which express the replication associated protein (Rep) and transactivator protein for the viral sense promoter. However, the other two regions showed a high, but not a complete, level of interference for genome accumulation and viral infection symptoms. The obtained results may also be explained based on the length of the cloned fragments, as it was only 116 bp for Cl/C2 region compared to the other regions (280 bp for C2/C3 and 260 bp for Vl/V2) and / or the type of the genes they interfere. It can be concluded that this mechanism can result in higher viral resistance in tomato against TYLCV. [Adel Abdel-Sabour Rezk, Nagla A. Abdallah, Aly M. Abdel-Salam, M. K. Nakhla, H. M. Mazyad (Egypt) and D. P. Maxwell (USA). Arab Journal of Biotechnology, 9(1): 143-158, 2006].

IRAN

Antagonistic Effect of Some Species of *Pleurotus* on the Root-knot Nematode, *Meloidogyne javanica in vitro*. Antagonistic effect of five species of *Pleurotus*, including *P. ostreatus*, *P. sajor-caju*, *P. cornucopiae*, *P. florida* and *P. eryngii* on second stage juveniles (J2) of *Meloidogyne javanica* were studied, *in vitro.* On water agar, all of the species tested produced tiny droplets of toxin. Nematodes touching such droplets showed a sudden response and became colonized by the fungi after 24-48 h. Filtrates of the tested fungi grown in malt extract broth were toxic on the nematodes but this toxicity varied between species. Culture filtrates of *P. ostreatus* showed the highest nematicidal activity toward *M. javanica* J2 and the lowest toxic effect was observed in filtrates of *P. eryngii*. A linear relationship was proved between increasing toxin concentration and the percentage of dead nematodes. [R. Heydari, E. Pourjam and E. Mohammadi Goltapeh (Iran). Plant Pathology Journal, 5 (2): 173-177, 2006].

LEBANON

Tolerance in Cucumber to *Cucurbit yellow stunting disorder virus*. *Cucurbit yellow stunting disorder virus* (CYSDV), genus *Crinivirus* and family *Closteroviridae*, has emerged as a serious whitefly-transmitted virus of cucurbit crops, causing between 30 and 50% yield losses. Development of resistant cultivars represents an economically and environmentally sound approach to management of this disease. In all, 124 cucumber accessions were evaluated for reaction to CYSDV under high inoculum pressure over three growing seasons. Seven accessions showed delayed expression of symptoms, milder final symptoms, and lower percentages of infected plants compared with susceptible cucumbers. Although none of these accessions were immune to CYSDV, virus concentrations in the middle leaves of the tolerant accessions were significantly lower than those of susceptible accessions. [Sahar Eid, Yusuf Abou-Jawdah, Choaa El-Mohtar, Hana Sobh (Lebanon) and Michael Havey (USA). Plant Disease, 90: 645-649, 2006].

PAKISTAN

Evaluation of Integrated Weed Management Practices for Onion in Pakistan. Weed management studies in transplanted onion were conducted during 2004 and 2005 at the National Agricultural Research Centre, Islamabad, Pakistan. Pendimethalin and oxadiazon were applied post-

emergence 2 days and 4 week after transplanting and their efficacy alone and in combination with one manual weeding was evaluated to reduce weed competition and its effects on marketable bulb yield. Hand weeded and weedy check were included. Compared to weed free condition, weed crop competition caused 71% and 76% reduction in the marketable bulb yield during the first and second year, respectively. *Cyprus rotundus* (41%) and *Coronopus didymus* (19%) were the dominant weeds recorded in the field. Both pendimethalin and oxadiazon when applied 2 DAT in combination with one weeding at 60 DAT were found more effective in enhancing marketable bulb yield and recorded higher net returns than other treatments. [Khalid Mahmood Khokhar, Tariq Mahmood, Muhammad Shakeel and M. Farooq Chaudhry (Pakistan) Crop Protection, 25 (9): 968-972, 2006].

SAUDI ARABIA

Evaluation of Phylogenetic Relationship Between three Phenotypically Different Forms of Red Date Palm Weevil *Rhynchophorus ferrugineus* Oliv. Using PCR-based RAPD Technique. Red date palm weevil *Rhynchophorus ferrugineus* Oliv. is a widespread major pest of date palm in the Kingdom of Saudi Arabia. Three different forms (black and brown with and without spots on thoracic region) were investigated using PCR-based RAPD technique. Although weevils were collected from the same geographical region of Al-Hassa in Saudi Arabia, the banding profile acquired suggested that black and brown colored morphs are genetically closer compared to the brown with spots. Intra color variation remained minimum in black but brown and brown spotted morphs exhibited more genetic variation. This genetic variation may be either due to the generation of new mutants from the non-spotted or spotted weevil or they may belong to a different race. [H. Y. Al-Ayied, A. M. Alswailem, O. Shair, A. M. Al Jabr (Saudi Arabia). Archives of Phytopathology and Plant Protection, 39(4): 303-309, 2006].

SYRIA

Diagnosis of Some Sweet Potato Viruses Using Indicator Plants and Serological Tests. A survey of sweet potato viral diseases in the main cultivating areas of Syrian costal region was conducted during 2001/2002 and 2002/2003 growing seasons. Different symptoms of sweet potato samples showed positive infection with *Sweet potato feathery mottle virus* (SPFMV) and *Cucumber mosaic virus* (CMV). The same samples submitted to Sap mechanical transmission, and graft transmission on different indicator plants to determine the host range among indicator plants, and to detect some sweet potato viruses other than these detected by used antesera. Results showed that virus graft transmission was more efficient that sap mechanical transmission when these two methods were evaluated. All plants showed various degree of mosaic, chlorosis, leaf malfonnation, and stunting symptoms, two to three weeks post-graft inoculation. *Sweet potato feathery mottle potyvirus* is graft-transmissible from infected samples to *N. tabacum* (sn), *N. benthamiana*, *Ipomoea setosa, I. nil* and *Chenopodium quinoa. Cucumber mosaic cucumovirus* also graft-transmissible to *N. glutinosa N. benthamiana* and *N. tabaccum* (w.b), but it is not mechanically sap-transmissible. So it is possible to consider these plants as indicators of these two viruses in graft inoculation case. Moreover, different viruses symptoms on the same indicator plants were observed, as *I. setosa,* when these plants were grafted by different sweet potato scion infection with SPFMV. This result is new, and it is possible that different strains of SPFMV are present in region. [Imad D. Ismail, Salem U. Raie and Ensaf Akil (Syria). Tishreen University for Studies and Scientific Research-Biology Science (Syria), 28(1): 161-173, 2006].

Evaluation of the Efficiency of Coccinelllid *Serangium Parcesetosunl* Sicard (Coleoptera: Coccinellidae) in Controlling *Bemisia tabaci* Genn (Homoptera: Aleyrodidae) on Eggplants in Open Field. This study was conducted to evaluate the efficiency of the predator *Serangium Parcesetosum* Sicard to control *Bemisia tabaci* Genn. on eggplants in open field. Dynamic changes in *B. tabaci* populations on eggplant in response to S. *parcesetosum* were monitored. *S. parcesetosum* were introduced at 30 adults at the end of July. The number of whitefly stages decreased from about 39 eggs, 52 larvae/ 1 cm^2 leaf in the middle of August to 1 egg and 2.7 larvae/ 1 cm^2 at the beginning of October. The difference was significant. The density of the coccinellid larvae reached the peak at the end of August (average 4.93, range 2-42 larvae per plant). The number of predator adults reached the peak at the beginning of October (average 11.4 adult, range 1-48 per plant). The percentage of parasitization by *Eretmocerus mundus* Mercet Hymenoptera: Aphelinidae) decreased from 15.2% in the middle of August to 0.48% at the beginning of October; whereas mortality (result the predator and other factors) increased from 11.45 to 98.54% in the same period. 25%, 50% and 25% of eggplant were cleaned from immature of *B. tabaci* by action of predator in August, September, and October respectively. Our data suggest that the *serangium* may work well in biological control program for *b. tabaci* on eggplants in the open field. [Mohammad Ahmad, Nabil Abo Kaf and Rafeek Abboud (Syria). Tishreen University for Studies and Scientific Research-Biology Science (Syria), 28(1): 109-120, 2006].

Introducing *Paeusia antennata* to Control Brown Peach Aphid in Syria. Syria is one of the main almond producers in the world. Various insects attack almond trees, mainly aphids. During previous years, brown peach aphid *Pterochloroides persicae* Kholodkovskii (Homoptera, Aphididae) distributed widely in almond and peach orchards. This aphid species is common in the Mediterranean basin and several regions of the world. Its host range is restricted to stone fruits trees and rarely on pome fruits. Almond trees attacked with this aphid is usually covered with intensive honeydew and become very weak. Farmers use chemical insecticides to control it. In order to reduce insecticides use and control costs, a survey for their natural enemies was conducted in southern Syria for several years. Few natural enemies were recoded as a result with limited efficacy. Because of the successful introduction and use of parasitoid *Paeusia antennata* (Mukerji) (Hym., Braconidae, Aphidiinae) in Yemen, this parasitoid was introduced from Yemen to some almond orchards in As-Sweida governorate, southern Syria in the summer of 2006. *P. antennata* was introduced as adults to avoid introducing hyperparasitoids with it. The released parasitoid is still being monitored to know if it is well established especially in the cold winter conditions of Syria, which differ than in Pakistan and Yemen. [Wa'el Almatni, Department of Plant Protection, Ministry of Agriculture, Damascus, Syria, Email: almatni@scs-net.org].

The Introduction, Rearing and Dissemination of the Predator Mite *Phytoseiulus persimilis* on the Spider Mite *Tetranychus urticae* in Syria. The spider mite *Tetranychus urticae* is considered an important pest in protected agriculture, field crops, fruit tree and ornamental plants. To control this pest biologically, the predator mite *Phytoseiulus persimilis* was introduced to Syria from Egypt in 2005, and increased at the Lattakia Center for Rearing and Natural Enemies Applications. This predator was used in 2006 for the first time, and its use in plastic houses and the open field continues in the coastal areas of Syria. [Munizr Halloum[1] and Alisar Shaabo[2]. (1) Plant Protection Department, Faculty of Agriculture, Tishreen University, Lattakia, Syria; (2) Mites Section, Lattakia Center for Rearing and Applications of Natural Enemies, Lattakia, Syria, Email: alisar78@scs-net.org].

White Sticky Traps: An Environmentally Safe Approach to Control Onion Fly in Syria. During the last few years, onion yield losses caused by the onion fly *Hylemia antique* (Meig.) (Family Anthomyiidae, sub-order Brachycera, order Diptera) in Syria have been increasing, especially in the Ghab area. This increase damage could be due (i) imported onion varieties are susceptible to infestation, (ii) extensive use of pesticides which affected the population of natural enemies, (iii) emergence of resistance to pesticides in the pest population, (iv) development of new more aggressive types of the pest. This led to reduced area planted to onion and increased price. Consequently, efforts at the Faculty of Agriculture at the University of Aleppo focused on development of practical, low cost and environmentally safe approach to control this pest. Experimentation focused on the use of sticky colored traps, and the identification the color which can attract the largest number of insect adults. The glassy white color was the most effective and attracted around 95% of the pest population in the field. Experimentation should that the use of white glassy sticky traps, 20x30 cm (Rebell traps) fixed on a pole in the field 60 cm above soil level and posted during the third week of October at the time of the adults emergence, led to the trapping of 98% of the pest population. The pest has two generations per year, the first generation being the most damaging. By using the white glassy sticky traps, pest infestation was kept below 1% as compared to 60-70% during the previous season, where chemical pesticides were used. [Mahmoud S. Lababidi, Faculty of Agriculture, University of Aleppo, Syria, Email: mslababi@scs-net.org]

TUNISIA

Identification of *Rhizobium* Isolates Possessing Antagonistic Activity against *Fusarium oxysporum* f.sp. *ciceris*, the Causal Agent of Fusarium Wilt of Chickpea. Using two cultivars (the susceptible ILC482 and the moderately resistant INRAT 87/1) of chickpea (*Cicer arietinum*), the antagonistic activities of 21 *Rhizobium* isolates were tested in vitro in dual culture, and in vivo under greenhouse and field conditions against *Fusarium oxysporum* f.sp. *ciceris* (Foc) race 0, the causal agent of Fusarium wilt of chickpea. In dual culture, 14 isolates inhibited the mycelial growth of the pathogen more than 30% and the most effective were Rh8, Rh11, Rh16 and PchSOM, which inhibited fungal growth more than 50%. Among the 14 *Rhizobium* isolates tested for volatiles, cyanide production and phosphate solubilisation, 8 significantly inhibited fungal growth by producing volatiles, 6 were positive for cyanide production and only three were able to solubilise phosphate. Isolate Rh8 produced the highest levels of volatiles, giving more than 10.7% fungal inhibition, and was the only one positive for both cyanide production and phosphate solubilisation. Greenhouse experiments on the same 14 isolates revealed the effectiveness of five: PchDMS, Pch 121, Rh5, Rh17 and Pch43. These reduced the percentage of wilted plants in both susceptible and moderately resistant cultivars. These percentages ranged from 12.5 to 54.6% in the susceptible cultivar ILC482 and from 8.3 to 29.1% in the moderately resistant cultivar INRAT 87/1. The best disease control was achieved by isolate PchDMS. Despite its effectiveness in vitro, isolate Rh8 was ineffective under greenhouse conditions. Field experiments showed that none of the 14 Rhizobium isolates significantly reduced the percentage of wilted plants of the susceptible cultivar ILC482, although with the moderately resistant cultivar INRAT 87/1 eight of the isolates significantly reduced wilt incidence. Inoculation of seeds with these isolates reduced the percentage of diseased plants from more than 48.6% in infected control plants to less than 20.3% in plants inoculated with the bacteria and infected with the pathogen. The best protection against disease was obtained with isolates Pch43 and Rh4, which reduced the percentage of wilted plants to less than 8%. Besides their beneficial effects on disease control, our studies showed that rhizobia may improve plant growth and yield. These results indicate that *Rhizobium* isolates could be effective under commercial conditions in reducing the deleterious effects of Fusarium wilt. [A. Arfaoui, B. Sifi, A. Boudabous (Tunisia), I. El Hadrami (Morocco) and M.Chérif (Tunisia). Journal of Plant Pathology, 88 (1), 2006].

Study of the Interaction between *Orobanchefoetida* and Faba Bean at Root Level. Two faba bean lines, a breeding line (XBJ90.03-16-1-1-l-1) and a Tunisian commercial variety cv. Bachaar, were used to study the interaction between *Orobanche foetida* and faba bean using root chamber technique. The percentage of *O. foetida* germination was significantly higher in cv. Bachaar than in the breeding line. The number and the percentage of tubercles were also higher on cv. Bachaar. The breeding line showed a resistant reaction to orobanche infestation since the first stage of the parasite development by a reduction in the germination stimulation. *O. foetida* germination appeared to be slightly lower with conditioned seeds than with unconditioned ones, however this difference was not significant Thus, preconditioning period did not show any effects on orobanche germination. [Zouhaier Abbes, Mohamed Kharrat and Wided Chaibi (Tunisia). Tunisian Journal of Plant Protection, 1(1): 55-64, 2006].

The Occurrence of Unusual Brown Macula in Swarming Desert Locusts, *Schistocercti gregoria* Forsk., *(Orthoptero-Acrididae)* in Douiret, Southern Tunisia. During the 2004 invasion of South Tunisia (in the Douiret area of Tataouine) by the desert locust, 47010 of the captured locusts had unusual pigment spots on their head and/or sternum. Upon analysis of dead locusts, the spotted ones contained residual chlortpyriphos-ethyl up to 0.2 mg/kg while the nonspotted ones had much lower insecticide concentrations (0.02 mg/kg). Spotted locusts have a lower mortality rate than the non spotted ones, indicating that some resistance mechanism may be operating. Frontal spots are more frequent in males than in females and more in the locusts with 6 eye stripes

than with 7. In contrast, the ones carrying sternal spots are more common among females than males and more among the 7- than the 6 eye striped locusts. [Mohamed Ammar, Hayfa Boudegga and Mohamed Habib Ben-Hamouda (Tunisia). Tunisian Journal of Plant Protection, 1(1): 1: 31-42, 2006].

TURKEY

The Effect of Lygus Bugs (*Exolygus prantensis* L.) on Marketing Price of Red Lentil in Anatolia, Turkey. The aim of this study was to assess the damage commonly known as chalky spot syndrome caused by the lygus bug on red lentil and the negative relation to the resulting marketing price in the commodity market of Sanliurfa, Turkey. Analysis showed that there was significant difference among the content (%) of chalky spot damage (range 1.45–29%) of lentil samples collected from the farmers who brought their crops to sell in the commodity market and this was negatively related to the market price that farmers received. Marketing prices of samples were also found to be significantly affected. The correlation between visually inspected chalky spot damage (%) and that of decorticated and weighted lentils was found to be positive and significant. Marketing prices also were found to be negatively correlated with the results of both inspection methods. Further analysis indicated that regression equations could be used for price estimation of lentil with different ratios of chalky spot. It was concluded that 10% chalky spot can reduce the marketing price from 0.426 to 0.396 \$ kg^{-1} when visually inspected and from 0.438 to 0.358 \$ kg^{-1} when decorticated. [İrfan Özberk , Ayhan Atlı, Fethiye Özberk and Abuzer Yücel (Turkey). Crop Protection, 25(12): 1227-1230, 2006].

Investigation of *Plum pox virus* in Different Tissues of Apricot and Plum Trees. In order to investigate *Plum pox virus* (PPV) in different tissues of infected apricot and plum trees, 50 samples per infected tree were collected from 5 apricot and 5 plum trees infected with PPV-M and D strains between 2002 and 2004. In addition, 25 apricot and 25 plum seeds taken from severely infected trees in order to investigation transmission of PPV through seeds. The detection of PPV was carried out using indirect ELISA. The virus was detected in bark, some flower parts (sepal, petal and stamen), pits (only in apricots) and fruits. However, the virus was not found in pollens, gynoeciums, seeds and seedlings. It is appears that pollens and seeds did not play role in natural spread of PPV in Ankara, Turkey. [I.O. Elibuyuk (Turkey). Plant Pathology Journal, 5 (2): 208-211, 2006].

UNITED ARAB EMIRATES

Control of the Red Palm Weevil *Rhynchophorous ferrugineus* Olivier (Coleoptera: Curculionidae) Using Aggregation Pheromones. Red palm weevil *Rhynchophorous ferrugineus* Olivier (Coleoptera: Curculionidae) is one of the most important insects attacking date palms in many date palm growing areas world-wide. Aggregation pheromone traps were used in one date farm at Al-Khatem region in the United Arab Emirates and gave good results. Traps captured large numbers of weevils throughout the year and prevented it spread into new areas. They also reduced its numbers in the infested areas, helped locating Infested spots, and determined insect periods of activity and sex ratio during the year. Such information is helpful in preparing plans and programs to control the red palm weevil and evaluating its control operations. It is known that pheromones do not cause any damage to the environment, humans, and animals and using them for insect control is quite easy and inexpensive on the long run. Results of this study demonstrated the effectiveness of the concentrations: 200, 400, 700 mg of the pheromone 4-Methyl-5-Nonanol 90% + 4-Methyl-5-Nonanon 10%. This can put the pest under economic threshold after period of use this method. The concentration 700 mg had significantly better catch than 200 mg, however no significant differences were observed between the other treatments and the control. The numbers of collected insects were 169, 216, 258, and 245 for the three concentrations and the control, respectively. The total number of collected insects was 888 (354 males and 534 females) in one year. Red palm weevil does not enter diapause and it is found throughout the whole year in the date palm farms. The largest number of insects caught occurred in two periods. The first period was from September until November and the second was from March until May. The red palm weevil sex ratio (males: females) varied between months and it was 1:1.51 for the total number of insects caught during one year. The effectiveness of pheromone traps can be affected by several important factors (pheromone, pheromone concentration, time of use, bait, pheromone changing time, bait changing time, presence of water in the trap, infestation severity in the farm, trap distribution in the farm, and trap maintenance). [Ahmed Hussein AI-Saoud (United Arab Emirates). Damascus University Journal for Agricultural Science (Syria), 22(1): 147-164, 2006].

❖ SOME PLANT PROTECTION ACTIVITIES OF FAO AND OTHER ORGANIZATIONS

DESERT LOCUST SITUATION

General Situation during November 2006 forecast until mid-January 2007

Small hopper bands formed during November in northwest Mauritania and in southern Western Sahara from of an outbreak that occurred in October. Small groups of hoppers and adults formed in Mali and Niger as vegetation fried out. Ground teams in Mauritania, Western Sahara and Niger treated 3,200 ha. Limited infestations are expected to persist in these countries in the coming months and, unless further rainfall occurs, breeding should end. Small-scale breeding started along the Red Sea coast in Sudan and Eritrea, while only isolated adults were present in Yemen. Breeding is expected to occur during the forecast period on both sides of the Red Sea causing locust numbers to gradually increase. The situation remained calm in Southwest Asia.

Western Region – Ground control operations treated nearly 900 ha of hopper bands and groups in northwest Mauritania and 600 ha in Western Sahara during November. In Mauritania, these operations were supplemented with biological control trials using *Metarhizium*. As little rain fell during November, the infestations were limited to juts a few areas and should remain so unless more rains fall. Although low temperatures will delay egg development and locust

maturation, there is a risk of adults moving further north to northern Mauritania and the Draa Valley in Morocco during periods of warm southerly winds. Surveys could not be carried out in northeast Mali but small groups of hoppers and adults formed further west near Tombouctou as well as further east on the Tamesna Plains in Niger. Ground teams treated 1,700 ha in Niger. As vegetation continues to dry out in Mali and Niger, locusts will concentrate in the few areas that remain green where they could form small groups. No locusts were reported elsewhere in the region.

Central Region – Isolated solitarious adults were present and laying eggs in a few places on the Red Sea coastal plains in Sudan and Eritrea. Solitarious adults were also reported on the Red Sea coast in Yemen. Small-scale breeding is expected to occur during the coming months along parts of the Red Sea coast between southeast Egypt and central Eritrea as well as from the central coast in Saudi Arabia to Yemen. The extent of the breeding will depend on rainfall during the forecast period. Consequently, all efforts should be made to monitor these areas closely on a regular basis.

Eastern Region – Low numbers of solitarious adults persisted in a few places in Rajasthan, India during November. Limited breeding occurred in one area that was flooded in Augusts. No significant developments are expected during the forecast period in the region.

CONTROL OF LOCUSTS

New bio-control agents - Recent advances in biological control research, coupled with improved surveillance and intelligence, could make a big difference when the next round in the battle is fought. Such products could make it possible to sharply reduce the amount of chemical pesticides used. One promising avenue is research currently under way at the International Centre for Insect Physiology and Ecology (ICIPE) in Nairobi. An ICIPE team headed by a Zanzibar-born chemical ecologist, Ahmed Hassanali, has identified and synthesized a specific locust pheromone, or chemical signal, that can be used against young locusts with devastating effect. Phenylacetonitrile, or PAN for short, normally governs swarming behaviour in adult males who also use it to warn other males to leave them in peace while they mate. But, Hassanali found it has startlingly different results on juvenile wingless locusts, known as hoppers.

Hopper bands - Just as adult locusts form swarms, hoppers will, given the right conditions, stop behaving as individuals and line up in marauding bands up to 5 kilometres wide. They are only slightly less voracious than adults, who eat their own weight of food every day. In three separate field trials – the most recent in Sudan last year – Hassanali's team showed that even minute doses of PAN could drop hopper bands dead in their tracks and make them break ranks. PAN caused the insects to resume solitary behavior. Confused and disoriented, some lost their appetite altogether, while others turned cannibal and ate one other. Any survivors were easy prey for predators. What makes PAN particularly attractive is that the dose needed is only a fraction – typically less than 10 millilitres per hectare – of the quantities of chemical or biological pesticides. This translates into substantially lower costs – 50 cents per hectare as opposed to US$12 for chemical pesticides and $15-20 for other bio-control agents. That is clearly a major consideration in the countries in the front line – many of them among the world's poorest.

Green Muscle - A different, but also highly effective biological approach is Green Muscle ®, a bio-pesticide developed by the International Institute for Tropical Agriculture's biological control centre in Cotonou, Benin, and manufactured in South Africa. Green Muscle ® contains spores of the naturally occurring fungus *Metarhizium anisopliae* var. acridum, which germinate on the skin of locusts and penetrate through their exoskeletons. The fungus then destroys the locust's tissues from the inside. This is definitely not good news for locusts, but the fungus has no effect on other life forms. A product similar to Green Muscle ® is already successfully used in Australia, but the latter's introduction in Africa and Asia is being slowed by several factors. These include a need for further large-scale trials, official approval of the product in several countries, and a relatively short shelf-life in its normal ready-to-spray liquid form. One drawback is that it takes days to kill the locusts. It is also relatively expensive and large-scale production would need to be organized. A solution would be to store the product in powder form and dilute it just before use. Hassanali's team has also shown that, if used in combination with a small amount of PAN, only a quarter of the normal dose of Green Muscle ® is needed.

Insect Growth Regulators - Also being readied for the modern locust fighter's armoury is a class of products known as Insect Growth Regulators, or IGRs, which influence the ability of hoppers to moult and grow properly. They have no direct toxic effects on vertebrates. IGRs are effective for several weeks after application and can be used in so-called barrier treatments. In this method only narrow swathes of the product are applied, perpendicular to the direction of the marching hopper bands. Only 10 percent of the amount used in blanket treatment is needed. After marching over one or two barriers the hoppers absorb enough product to die while moulting. As with PAN and Green Muscle ®, however, IGRs need to be aimed at locusts at an early stage in their lives, before they take to the air. That, in turn, requires an advanced level of surveillance and intelligence-gathering to make sure that any locust concentrations are nipped in the bud.

eLocust2 - Although back at ECLO Keith Cressman has satellites, computers and mathematical models at his disposal, the weak link in the chain has been the time it takes to get good information from the field. The mobile ground teams whose job it is to keep tabs on locust populations have to work in some of the world's remotest, hottest and sometimes (for environmental and security reasons) most hostile places. A week or more might go by before a report from, say, the central Sahara, reached Cressman's desk. By that time the locusts – "They don't need visas," he says – would quite likely have moved to another country or continent altogether. This will soon change however. Field teams are now being issued with special hand-held devices to record vital locust and environmental data and relay them back to their own headquarters and on to Rome in real time. Developed by the French Space Agency CNES, the eLocust2 device is able to bounce the information off communications satellites and have the data arrive in the National Locust Control Centre in the affected country a few minutes later, from where they are passed on to Cressman for analysis. In case of unusually heavy hopper concentrations, immediate action can be taken to make sure that the locusts never grow old enough to swarm. *Information source is:*
www.fao.org/newsroom/en/focus/2006/ 1000345/index.html

9TH ARAB CONGRESS OF PLANT PROTECTION

19-23 November 2006, Damascus, Syria

Under the Patronage of His Excellency the Prime Minister of the Syrian Arab Republic, the Ninth Arab Congress of Plant Protection, organized by the Arab Society of Plant Protection (ASPP) and the General Commission for Scientific Agricultural Research (GCSAR), Syria, was held at the Congress Palace, Damascus, Syria, 19-23 November, 2006. Around 600 researchers from 15 Arab countries (Algeria, Egypt, Jordan, Libya, Oman, Palestine, Saudi Arabic, Sudan, Syria, Tunisia, Yemen, Morocco, Lebanon, United Arab Emirates and Qatar) in addition to participants from Iran, Pakistan, USA, Greece, Italy, France and UK took part and delivered oral and/or poster presentations in plant protection.

The congress program included four Scientific symposia: "Invasive Pest Species: Identification and potential Control", "Policy and Developmental Issues in Plant Protection", "Pests Management without Synthetic Chemical Pesticides" and "Molecular Diagnostics of Plant Pest Species". Invited Speakers from the Food and Agricultural Organization of the United Nations, ICARDA, University of Nebraska (USA), Ain Shams University (Egypt), University of Minnesota (USA), Cairo University (Egypt), National Research Center (Egypt), University of Athens (Greece); Central Science Laboratory (Sand Hutton UK) and Istituto do Virologia Vegetale, Torino (Italy) participated in the symposia. The abstracts (in Arabic and English) are published at the Arab Society of Plant Protection website http://www.asplantprotection.org

H.E. Mohamed Otri (second right), Prime Minister of Syria, with senior government officials at the Plant Protection Conference: H.E. Dr Adel Safar (center), Minister of Agriculture; H.E. Dr Amer Lotfy (second left), Minster of Economy; Dr Majd Jamal (right), Director General of GCSAR; and Dr Khaled Makkouk (left), ASPP.

During the third day of the congress, a field trip was organized for all the participants which covered a number of historical touristic sites in As-Sweida governorate (south Syria). During the evening of the last day of the congress, the ASPP celebrated its Silver Jubilee, and following the closing ceremony, all participants were invited to a cultural performance by the Syrian folk-dance group.

The following graduate students won the 6 awards presented by the Society and Private Companies for best oral and poster presentations: Mr Mohamed Khalaf (Oral), from GCSAR/ Aleppo University/ ICARDA, Syria; Mr Nader Asaad (Oral), from GCSAR/ Aleppo University/ ICARDA, Syria; Mr Mouhammad Azim Khan (Oral), from NWFP Agricultural University Peshawar, Pakistan; Ms Maymona Al-Masri (poster), from GCSAR/ Damascus University, Syria; Mr Anas Khanshour (poster), from Ecole Nationale Supérieure d'Agronomie de Toulouse, France; Ms Batool Karso (poster), from University of Dohuk, Iraq were announced as the award winners.

The congress was very well organized and events were well covered by the media. During the 9th ACPP Congress of Plant Protection, a new ASPP Executive Committee was elected to serve for a three years term (2007-2009) and is composed of: Dr Wafaa Khoury (Lebanon, President), Dr Majd Jamal (Syria, Vice President), Dr Mustafa Haidar (Lebanon, Secretary-Treasurer), Dr Safaa Kumari (Syria, Member & Chairman of the Publication Committee), Dr Mohamed El-Said El-Zemaity (Egypt, Member & Chairman of Membership Committee), Dr Ibrahim Al-Jboory (Iraq, Member & Chairman of Translation Committee), Dr Ahmad Katbeh (Jordan, Member & Chairman of Honour and Awards Committee) and Dr Khaled Makkouk (Lebanon, Member & Editor-in-chief, Arab Journal of Plant Protection).

Participants of the 9th Arab Congress of Plant Protection during the field trip around historical sites in Bousra, Southern Syria, November 2006.

ASPP *Executive Committee (2007-2009), from right, are Dr Wafaa Khoury (Lebanon, President), Dr Majd Jamal (Syria, Vice President), Dr Safaa Kumari (Syria, Member & Chairman of the Publication Committee), Dr Mohamed El-Said El-Zemaity (Egypt, Member & Chairman of Membership Committee), Dr Ibrahim Al-Jboory (Iraq, Member & Chairman of Translation Committee), Dr Ahmad Katbeh (Jordan, Member & Chairman of Honour and Awards Committee) and Dr Khaled Makkouk (Lebanon, Member & Editor-in-chief, Arab Journal of Plant Protection).*

❖ SHORT PLANT PROTECTION NOTES

- Acanthocytes of *Stropharia rugosoannulata* act as a nematode-attacking device to immobilize *Bursaphelenchus xylophilus* of pine in soil, report H. Luo and associates at Yunnan University, Peoples's Republic China. (Appl. Environ. Microbiol. 72:29822987, 2006)
- Essential oil obtained by hydrodistillation of aerial parts from *Happlopappus greenii* inhibited growth of three strawberry anthracnose fungi, report B. Demirci and associates at Anadolu University, Turkey, and ARS-USDA with University of Mississippi. (J. Agric. Food Chem. 54:3146-3150, 2006)
- Expression of barley BAX Inhibitor-1 in carrot confers resistance to *Botrytis cinerea*, report J. Imani and associates at Justus-Liebig-Universität Giessen, Germany. (Mol. Plant Pathol. 7:279-284, 2006)
- Extracts of *Brassica* sp. seed meal and poinsettia and spurge shoots controlled sting nematode 70 to 92% in soil, report C. J. Cox and associates at Clemson University, SC. (Agron. J. 98:962-967, 2006)
- Flutriafol + imazalil sulfate and propiconazole are effective alternatives tocarboxin + thiram to control head smut of sweet corn, report P. J. Wright and associates at New Zealand Institute for Crop and Food Research, Horticulture and Food Research Institute of New Zealand, and AgResearch, New Zealand. (N.Z. J. CropHortic. Sci. 34:23-26, 2006)
- Galling index is a quick, reliable method for screening cotton for resistance (resistance is partially dominant) to the root-knot nematode, report J. Zhang and associates at New Mexico State University and Cotton Inc., Cary, NC. (Crop Sci. 46:1581-1586, 2006)
- Of essential oils from 10 plant species, carvacrol from *Origanum vulgare* was the best antibiotic to the 3 major pathogens of *Agaricus bisporus*, report M. Sokovic and J. L. D. van Griensven at Wageningen University, Netherlands, and Institute for Biological Research, Belgrade, Serbia, and Montenegro. (Eur. J. Plant Pathol. 116:211-224, 2006)
- Plasmid pSci6 from *Spiroplasma citri* confers insect transmissibility to a non-transmissible strain, a first report of phenotypic change associated with transformation of *S. citri* by natural plasmids, report N. Berho and associates at INRA, Université de Bordeaux, France. (Microbiology 152:2703-2716, 2006).
- Polyphenol oxidase is involved in plant defense and usable as a marker for resistance of pearl millet to downy mildew, report S. N. Raj and associates at University of Mysore, India. (Funct. Plant Biol. 33:563-571, 2006)
- Potato tubers washed until less than 5% of tubers retained visible soil has an acceptably low risk of carrying cysts of the potato cyst nematode, report R. Gardener and associates at the Ferntree Gully Delivery Centre, Victoria, Australia. (Austral. Plant Pathol. 35:385-389, 2006)
- Resistances of sweetpotato to *Sweet potato mild mottle virus* and *Sweet potato feathery mottle virus* were lost when each was coinfected with *Sweet potatochlorotic stunt* virus, report S. B. Mukasa and associates at Makerere University(Uganda), Swedish University of Agricultural Sciences, and University of Helsinki.(Plant Pathol. 55:458-467, 2006)
- *Rhamnus lycoides* in Tunisia is a new aecial host of oat crown rust and can account for virulence diversity detected in line trials, report I. Hemmami and associates at INRAT, Ariana, and Université de Tunis El Manar, Tunisia. (Eur. J. Plant Pathol.115:357-361, 2006)
- Root colonization of papaya and passion fruit by arbuscular mycorrhizal fungi was stimulated by application of red and green algal extracts, report K. Kuwada and associates at Yamaki Co., Ltd., Okayama Gakuin University, and Kyoto Prefectural University, Japan; and Jomo Kenyatta University, Nairobi, Kenya. (Agron. J. 98:1340-1344, 2006)
- To use microbial inoculation to suppress oomycete-causing diseases of tomato, inoculation must be done early in soilless system setups or organisms chosen must replace an established but variable community, report L. A. Calvo-Bado and associates, University of Warwick, UK. (J. Appl. Microbiol. 100:1194-1207, 2006)
- Two phytoplasmas related to the pigeon pea witches'-broom group are associated with the almond witches'-broom disease in Iran, report M. Salehi and associates at the Agricultural Research Center of Fars, Shiraz University, and Bahonar University, Iran. (J. Phytopathol. 154:386-391, 2006)
- Wounding first leaves of *Vicia faba* reduced infection by *Uromyces fabae* by accumulating jasmonic acid and trihydroxy oxylipins that inhibit spore germination, report D. R. Walters and associates at Scottish Agricultural College, UK, and University of Lausanne, Switzerland. (Ann. Bot. 97:779-784, 2006)

❖ GENERAL NEWS

PH.D. DEGREE ON INSECT TAXONOMY AND ECOLOGY

Mr. Nazir Khalil completed the requirements for the Ph.D degree at the Faculty of Sciences, University of Damascus. The thesis research was supervised by Dr Abdelrahman Murad (University of Damascus), Dr Zuheir Amro (University of Science and Technology, Jordan) and Dr Mahmoud Karroum (University of Aleppo). Mr Khalil defended his thesis entitled "A contribution to the taxonomy and ecology of Coccinellidae species in Southern Syria", on March 23, 2006 in the presence of professors, graduate students and researchers. The Thesis Defense Committee was

compose of Dr Abdelrahman Murad, Dr Ahmad Katbeh Bader (Faculty of Agricultural, University of Jordan), Dr Mohamed Maher Kabakeebi (Faculty of Sciences, University of Damascus). Mr Khalil was awarded the Ph.D degree with honor.

CGIAR Award for ICARDA's Innovative Research Partnership

Dr Mustapha El-Bouhssini (ASPP member and ICARDA entomologist), and his colleagues Drs Bruce L. Parker and Margaret Skinner (from the University of Vermont, USA), won the CGIAR Award for Innovative Partnership at a competition held on 5 December, 2006 during the Annual General Meeting (AGM) of the CGIAR in Washington, DC. The award ($30,000) won for collaborative research on Integrated Management of Sunn Pest in West and Central Asia. The team received the award from Dr Katherine Sierra, Vice-President of the World Bank's recently formed Sustainable Development Network, and the new CGIAR Chair.

Drs Mustapha El-Bouhssini (second left), Bruce L. Parker (left) and Margaret Skinner (center) received the award from Dr Katherine Sierra (third right), CGIAR Chair. Dr Franklyn Moore (third left), of USAID, and Dr Ruth Haug (right), Professor and Head of Department at NORAGRIC, Norway, also participated in the award-giving ceremony.

THE TIGER TECHNIQUE IN PLANT PATHOGEN DIAGNOSIS

Scientists at the US Department of Agriculture's, Agricultural Research Service (ARS) are enthusiastic over a new and powerful plant pathogen diagnostic technique. Christened TIGER – short for Triangulation Identification for Genetic Evaluation of Risks – the new procedure has the potential to identify virtually every kind of microbe that may be present in a given sample, and it does so in a matter of minutes. According to William Schneider of the ARS Foreign Disease-Weed Science Research Unit, TIGER has the speed, sensitivity, and accuracy to be a powerful tool in distinguishing new, undescribed pathogens from native-born crop threats.

Like other PCR-based fingerprinting methods now used for early detection and routine monitoring of plant pathogens, TIGER makes use of specially designed fragments of nucleic acid called "primers." Their job is to find, and bind to, complementary segments of DNA in a pathogen's genome. However, unlike in today's PCR methods where primers are designed for the targeted pathogen's DNA, TIGER's primers are very general and serve as a one-size-fits-all tool that detects all bacteria in a given sample. It therefore eliminates the need for prior genome sequencing. The database on which TIGER now relies mainly contains information on bacterial pathogens of humans. Soon there will be the addition of plant-disease bacteria, and the stage will be set for TIGER-based identifications of plant-pathogenic fungi and viruses. *The complete press release can be read at: http://www.ars.usda.gov/is/pr/2006/061103.htm*

CSIRO IDENTIFIES MARKERS FOR WHEAT RUST RESISTANCE

Australia's CSIRO Plant Industry researchers have discovered a DNA marker for two important rust resistance genes in wheat, Lr34 and Yr18. These two genes are often inherited together and provide wheat plants with improved protection against leaf rust and stripe rust – two major diseases of wheat in Australia and worldwide.

CSIRO scientist Evans Lagudah said that the DNA marker is 99 percent effective in determining the presence of Lr34 and Yr18 in different wheat from Australia, India, China, and North America. The markers are now being used in Australia and worldwide. *The complete press release is at http://www.csiro.au/csiro/content/standard/ps2kc.html*

GM TOBACCO WITH INSECTICIDAL PROPERTIES

Researchers at the University of Florida, Institute of Food and Agricultural Sciences have genetically modified a tobacco mosaic virus to make it produce a natural, environmentally friendly insecticide which can kill pests that consume the inoculated plant's leaves. The tobacco mosaic virus on its own is known to cause severe crop losses. It attacks not only tobacco, but also other plants in the *Solanaceae* family – including tomatoes, eggplants, bell peppers and potatoes. It causes mottling and discoloration of the leaves, and it can cause death. However, the genetically modified virus contains a chemical known as trypsin-modulating oostatic factor, or TMOF. This chemical is a hormone produced by the ovaries of female mosquitoes, and it stops insects from producing a crucial digestive enzyme called trypsin. As a result, the insects starve to death, as they become unable to draw nutrients from food.

Harvested plants infected with the modified virus can be processed to make mosquito control products. *For the full news article visit: http://news.ufl.edu/2006/12/12/virus*

ENGINEERING ROOT-KNOT RESISTANCE IN PLANTS

Root-knot nematodes (RKN) are the most economically important group of plant-parasitic nematodes worldwide, attacking nearly 2000 species of crop and fiber plants. The nematode invades plant roots, and by feeding on the roots' cells, they cause the roots to grow large galls, or knots, damaging the crop and reducing its yields. Led by professor Richard Hussey, researchers from the University of Georgia, Iowa State University, and North Carolina State University engineered root-knot nematode resistance in transgenic plants by silencing or 'knocking out' an essential gene that causes the nematode to become parasitic. The result of their study is published in a recent issue of the Proceedings of the National Academy of Sciences (PNAS).

The research group described experiments to silence the parasitism gene 16D10 in root-knot nematode, and they confirm that the gene is essential for root-knot nematode to exhibit parasitism. In addition, expression of the same regulator for 16D10 in Arabidopsis resulted in resistance against the four major RKN species. The results of silencing of parasitism gene 16D10 in RKN could lead to the development of crops with broad resistance to this destructive pathogen.

Readers can access the full article, "Engineering broad root-knot resistance in transgenic plants by RNAi silencing of a conserved and essential root-knot nematode parasitism gene" at http://www.pnas.org/cgi/content/full/103/39/14302

❖ EVENTS OF INTEREST

MEETINGS AND SYMPOSIA

2007

*** April 11-13**

53rd Annual Soil Fungus Conference, The Piccadilly Inn University Hotel, Fresno, CA. *Please Contact*: James Gerik, Email: jgerik@fresno.ars.usda.gov; Website: http://soilfungus.ars.usda.gov

*** April 29 - May 4**

Population and Evolutionary Biology of Fungal Symbionts, Ascona, Switzerland. *Please Contact:* Bruce McDonald, Email: bruce.mcdonald@agrl.ethz.ch; Website: http://www.path.ethz.ch/news/conferences/2006_ascona

* **May 3-4**

International Congress, Commission of European Communities, COST 924 "Novel Approaches for the Control of Postharvest Diseases and Disorders."CRIOF-DIPROVAL Faculty of Agriculture, University of Bologna, Viale G. Fanin 46-40127 Bologna, Italy. *Please Contact:* Convener Prof. Paolo Bertolini, Email: bibcriof@agrsci.unibo.it

*** May 6-10**

15th International Reinhardsbrunn Symposium, Reinhardsbrunn, Germany, Modern fungicides and antifungal compounds.
Website: www.pk.uni-bonn.de/reinhardsbrunn

*** May 20-26**

5th International Geminivirus Symposium & 3rd International ssDNA Comparative Virology Workshop. Ouro Preto, Minas Gerais, Brazil. Please Contact: Murilo Zerbini, Email: zerbini@ufv.br; Website: www.ufv.br/dfp/virologia/OP2007

*** May 21-25**

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

*** August 12-17**

11th International Workshop on Fire Blight. Portland, Oregon. *Please Contact*: Ken Johnson, Email: johnsonk@science.oregonstate.edu or Virginia Stockwell stockwev@science.oregonstate.edu; Website: http://oregonstate.edu/conferences/fireblight2007

* **August 20-23**

The Third Asian Conference on Plant Pathology. Yogyakarta, Indonesia. *Please Contact:* Dr. Triwidodo Arwiyanto, Email: tarwiyanto@yahoo.com; Website: http://www.3rdacpp.com

*** September 2-4**

The 1st International Conference on Date Pala: Integrated Crop Management of Date Palm and its Impacts for Producing Clean and Safet dates, Giza, Egypt. *Please Contact*: Dr Ahmed Abdu Hamed, Programmed Committee Chariman, 7 Nadi El-Seid Street, Dokki, Giza, Egypt, Tel/Fax: 3372193/ 3356175; E-mail: plant_protection@hotmail.com, plantprotection5@yahoo.com

*** September 24-27**

16th Biennial Australasian Plant Pathology Society Conference, Adelaide, Australia.
Website:www.australasianplantpathologysociety.org.au

*** September 26-30**

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

*** October 8-12**

ISHS Second International Symposium on Tomato Diseases. Kusadasi, Turkey. *Please Contact:* Prof. Hikmet Saygili, Email: hikmet.saygili@ege.edu.tr; Website: www.2istd.ege.edu.tr

*** October 15-18**

XVIth International Plant Protection Congress (IPPC) to be held in association with IAPPS (International Association for the Plant Protection Sciences) and the BCPC International Congresses and Exhibitions, Scottish Exhibition Conference Center, Glasgow, Scotland, UK.
Website: www.bcpc.org/IPPC2007

*** October 15-19**

10th International Plant Virus Epidemiology Symposium *"Controlling Epidemics of Emerging and Established Plant Virus Diseases – The Way Forward"*, ICRISAT, Hyderabad, India. *Please Contact:* Dr. P. Lava Kumar, Convener IPVE2007, ICRISAT, Patancheru 502324, Andhra Pradesh, India, Email: p.lavakumar@cgiar.org; Website: www.ipve2007.net

*** October 21-26**

14th International Botrytis Symposium, Cape Town, South Africa. Email: conf@conferencesetal.co.za; Website: //academic.sun.ac.za/botrytis2007

*** November 12-15**

First International Phytoplasmologist Working group Meeting. Bologna, Italy. Please Contact: Prof. Assunta Bertaccini, Convener, University of Bologna; Fax: +39-051-2096723;
Email: bertaccini_a@biblio.cib.unibo.it

*** November 22-24**

5th International Congress of Mediterranean group on Pesticide Research (MGPR), Agadir, Morocco. Please Contact: MGPR 2007 Secretariat, B.P: 1123 Agadir 80 000, Morocco. Tel: +21228241006/0155; Fax: +21228242243; Email: mgpr2007@gmail.com; Website: www.iavcha.ac.ma

*** December 11-14**

International Conference on Emerging and Re-Emerging Viral Diseases of the Tropics and Sub-Tropics, New Delhi, India. Please Contact: Dr Anupam Varma, Conference Chairman, ICVT-2007, Indian

Virological Society, P.B. No. 11318, National Agricultural Science Complex, New Delhi 110012, India. Tel: +91-11-25842134; Fax: +91-11-25843113; Mobile: +91-9818756899; Email: icvtdelhi@yahoo.com; Website: www.icvt07delhi.org

2008

*** April 7-10**

The 2nd Arab Conference for Applications of Biological Control in the Arab countries, Cairo, Egypt.
Website: http://www.esbcp.org/Conferences.htm

*** August 24-29**

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

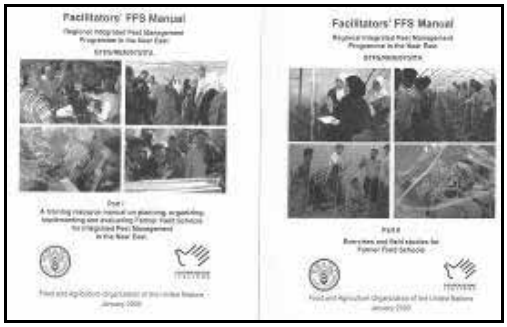
*** August 30 - September 2**

10th International Fusarium Workshop. Alghero, Sardinia, Italy.
Please Contact: Quirico Migheli, qmigheli@uniss.itat or Virgilio Balmas, balmas@uniss.it; Website: http://www.cdl.umn.edu/scab/10th_fhb_wkshp.htm

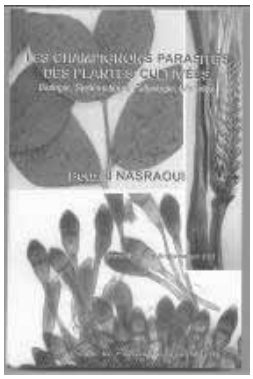
❖ PUBLICATIONS

NEW BOOKS

Facilitators' FFS Manual (Part I & II). 2005. This manual is a reference guide on the principles of IPM and organizing Farmer Field Schools (FFS). It is written for current and future facilitators involved in organizing and implementing FFSs in the Near East IPM project. Much of the content of this manual is based on IPM FFS experiences from Asia, Eastern and Central Europe, and other parts of the world. It also contains relevant experiences from our project partners in Iran and Egypt. Part I of this manual provides practical information and guidelines for the training of facilitators, FFS curriculum development, and will serve as a reference manual throughout the FFS planning, implementation and evaluation stage. The annexes to part I provide more detailed background information, sample forms, etc. Part II contains details of commonly used field studies and exercises for FFS. These exercises can be used for inspiration, but need to be adapted to fit the crop and local conditions. *Food and Agriculture Organization of the United Nations, Regional Integrated Pest Management Programme in the Near East, GTFS/REM/070/ITA.*



Fungi Pathogenic to Crops. 2006. Edited by Bouzid Nasraoui, Tunisia. The University Press in Tunis (Ministry of Higher Education) released a new book written in French and entitled "Fungi Pathogenic to Crops" together with an English version on a CD. The book covers the mycological and plant pathogenic aspects of the fungi causing disease to plants. The book provides readers on details related to the characteristics of fungi (part one), their taxonomy (plat two), basic principles of plant disease causal agents (part three), and lastly a section dealing with the life cycle of a large number of commonly known plant diseases (part four). The text is supported by 10 tables, 62 figures and 66 pictures taken by the author from the Tunisia environment. This book will be good source of information for all of those interested in biological sciences in general, and agricultural sciences in particular, especially those interested in detailed information on fungi that covers disease to cultivated crops. E-mail of the author: nasraoui.bouzid@iresa.agrinet.tn



Introduction to Beekeeping. 2003. Edited by Mouzahim Ayoub El-Saiegh and Abdel Raheem Omar Moustafa, Irbil, Iraq. This book reflects many years of experience in teaching and research, and is now needed be caused of the increased interested in bee keeping by farmers in Iraq. The book captures the progress made in beekeeping globally as well as in Iraq. The book includes 11 chapters covering: Definition of honeybees, taxonomy, rearing and feeding in addition to the pests and diseases which attach honey bees and the best way to control them. Published by the Extension Service, Food and Agriculture Organization of the United Nations, Agricultural Program of the Security Council Resolution 986. 300 pages. Email of the author: muzahimelsaiegh@yahoo.com

NEW JOURNAL

A new Journal was launched recently in Tunisia: **"Tunisia Journal of Plant Protection".** The scientific plant protection community in Tunisia is happy to announce the publication of the first issue of this journal which covers all research activities in plant protection sciences. The secretariat of this journal is at the Agronomy Institute in Kaf, but members of the Editorial Board are scientists located at the different Institutes in Tunisia that deals with plant protection disciplines. In addition, the editorial board includes internationally known scientists from outside Tunisia. The

Editorial Board of this journal welcomed high quality manuscripts written by scientists in Tunisia as well as other Arab countries and beyond. To take a look at the first issue you can visit the website: http://www.iresa.agrinet.tn/tjpp

❖ Selected Research Papers ❖ أوراق علمية مختارة

ENTOMOLOGY AND ACAROLOGY الحشرات والعناكب

Control of *Varroa jacobsoni* Oud. by fumigation with natural plant Substances. 2006. N. Daher-Hjaij and A. Alburaki (Syria). Arab Journal of Plant Protection, 24: 93-97.

Effect of different strawberry cultivars on the development and fecundity of the two –spotted spider mite, *Tetranychus urticae* Koch (Acari: Tetranychidae), with special reference to their chemical contents. 2006. Sawsan A Elsawi (Egypt). Annals Agricultural Science, Ain Shams University, Cairo (Egypt), 51(1): 295-302.

Effect of gamma radiation on eggs of *Callosohruchus maculatus* (Fabricius) (Coleoptera: hruchidae). 2006. Hamzeh Belal (Syria). Damascus University Journal for the Agricuturral Science (Syria), 22 (1): 131-146

Effect of temperature on biology and population growth parameters of *Aphis gossypii* Glover (Hom., Aphididae) on greenhouse cucumber. 2006. A. Zamani, A. A. Talebi, Y. Fathipour and V. Baniameri (Iran). Journal of Applied Entomology, 130(8): 453-460.

Effectiveness of certain nutrition, visual and olfaction cues in laboratory and field on the behaviour of *Epicometic (Tropinota) Squalida* (Scop.) (Coleoptera: Scarabaeidae: Cetoniinae). 2006. Shadia E. Abd EI-Aziz, H.A. Salem and Shimaa F. Fahim (Egypt). Annals Agricultural Science, Ain Shams University, Cairo (Egypt), 51(1): 283-293.

Study and suggestion of a uniform Arabic nomenclature system of economic insects. 2006. N.M. Al-Mallah (Iraq). 2006. Arab Journal of Plant Protection, 24: 125-133.

The effects of host plants and prey stage on feeding behaviour and feeding time of the whitefly predator *Serangium parcesetosum* Sicard (Coleoptera: Coccinellidae). 2006. R. Abboud and M. Ahmad (Syria). Arab Journal of Plant Protection, 24: 61-66.

DISEASES أمراض

BACTERIAL البكتيريا

Comparative studies on *Ralstonia solanacearum* infected potato using molecular laser raman spectroscopy and polymerase chain reaction. 2006. Mona Abdel Aziz and Mohamed A. Ibrahim (Egypt). Arab Journal of Biotechnology (Egypt), 9(1): 217-230.

Epiphytic survival of *Pseudomonas Viridiflava*, casual agent of pith necrosis of tomato, on weeds in Turkey. 2005. Y. Asyan and S. Uygar (Turkey). Journal of Plant Pathology, 87(4):135-140.

Molecular diagnosis of plant pathogenic bacteria. 2006. Weller, S.A. J.G. Elphinstone, N. Parkinson and R. Thwaites (UK). Arab Journal of Plant Protection, 24: 143-146.

FUNGI الفطور

Aggressiveness analysis of foliar fungi to leaves of wheat and rice crops. 2006. S. Iram and I. Ahmad (Germany & Pakistan). Archives of Phytopathology and Plant Protection, 39(6): 429-437.

Bio-fungicides as an alternative for tomato *Fusarium* crown and root rot control. 2006. K. Hibar, M. Daami-Remadi, W. Hamada and M. El-Mahjoub (Tunisia). Tunisia Journal of Plant Protection, 1: 19-29.

Brown spot of tangerine hybrid cultivars Minneola, Page and Fortune caused by *Alternaria alternata* in Iran. 2006. M. Golmohammadi, M. Andrew, T. L. Peever, N. A. Peres and L. W. Timmer (Iran & USA). Plant Pathology, 55(4): 578-578.

Brown spot of tangerine hybrid cultivars Minneola, Page and Fortune caused by *Alternaria alternata* in Iran. 2006. M. Golmohammadi, M. Andrew, T.L. Peever, N.A. Peres and L.W. Timmer. Plant Pathology, 55(4): 578-578.

Control of Fusarium crown and root rot of tomato, caused by *Fusarium oxysporum* f. sp. *radicis-lycopersici*, by grafting onto resistant rootstocks. 2006. Khaled Hibar, Mejda Daami-Remadi, Hayfa Jabnoun-Khiareddine and Mohamed El Mahjoub (Tunisia). Plant Pathology Journal, 5 (2): 161-165.

Effect of *Rhizobium* isolates on isoflavonoid levels in chickpea plant infected with *Fusarium oxysporum* f.sp. *ciceris*. 2006. A. Arfaoui, B. Sifi, A. Boudabous, I. El Hadrami and M. Cherif (Tunisia & Morocco). Phytopathologia Mediterranea, 45: 24-34.

First observations on *Verticillium dahliae* on olive in Tunisia. 2006. M. A. Triki, A. Hassaïri and M. Mahjoub (Tunisia). EPPO Bulletin, 36(1): 69-71.

First report of *Alternaria mali* causing necrotic leaf spot of apples in Turkey. 2006. H. Ozgonen and G. Karaca (Turkey). Plant Pathology, 55(4): 578-578.

First report of *Didymella rabiei* on chickpea debris in Tunisia. A. Rhaiem, M. Cherif, M. Harrabi and R. Strange (Tunisia). Tunisian Journal of Plant Protection, 1: 13-18.

First report of *Pestalotia subcuticularis* on *Pyrus mamorensis* in Morocco. 2006. K. Yamni, N. Dohou, A. Outcoumit, A. Ouazzani Touhami and A. Douira (Morocco). Phytopathologia Mediterranea, 45: 40-42.

***Fomitiporia mediterranea* infecting citrus trees in Greece.** 2006. K. Elena, M. Fischer, D. Dimou and D.M. Dimou (Greece & Germany). Phytopathologia Mediterranea, 45: 35-39.

Fusarium head blight and deoxynivalenol accumulation of wheat in Marmara Region and reactions of wheat cultivars and lines to *F. graminearum* and *F. culmorum.* 2006. Berna Tunali, Izzet Ozseven, Orhan Büyuk, Durmus Erdurmus and Ayse Demirci (Turkey). Plant Pathology Journal, 5 (2): 150-156.

Growth activities of the sugarbeet pathogens *Sclerotium rolfsii* Sacc., *Rhizoctonia solani* Khun. and *Fusarium verticillioides* Sacc. under cyanobacterial filtrates stress. 2006. Mohamed A. Rizk (Egypt). Plant Pathology Journal 5 (2): 212-215.

***Heterobasidion abietinum* on *Abies* species in western Turkey.** 2006. H.T. Dogmus-Lehtijarvi, A. Lehtijarvi and K. Korhonen (Turkey & Finland). Forest Pathology, 36(4): 280-286.

***In vitro* determination of *Fusarium* spp. infection on watermelon seeds and their localization.** 2006. N. Boughalleb and M. El Mahjoub (Tunisia). Plant Pathology Journal, 5(2): 178-182.

Interrelationship between spot blotch and common root rot in barley. 2006. M.I. Arabi, A. Al-Daoude and M. Jawhar (Syria). Australasian Plant Pathology, 35: 477-479.

Molecular diagnostics of fungal pathogens. 2006. E.J. Paplomatas (Greece). Arab Journal of Plant Protection, 24: 147-158.

Occurrence of *Cryphonectria parasitica* the causal agent of chestnut blight in Iran. 2006. M.N. Kazempour, S. A. Khodaparast, M. Arefipour, M. Salehi, B. Amanzadeh, M. Ramazanie and B. K. Shiraz (Iran). Plant Pathology, 55(6): 815-815.

Pathogenic variation among isolates of *Rhynchosporium secalis* from cultivated barley growing in central Anatolia, Turkey. 2006. A. Araz and S. Maden (Turkey). Plant Pathology Journal, 5 (2): 244-247.

Pathogenicity of Tunisian isolates of three *Verticillium* species on tomato and eggplant. 2006. Hayfa Jabnoun-Khiareddine, Mejda Daami-Remadi, Khaled Hibar, Fakher Ayed and Mohamed El Mahjoub (Tunisia). Plant Pathology Journal, 5(2): 199-207.

Screening of the resistance levels of 26 sesame breeding lines to *Fusarium* wilt disease. 2006. H. Kavak and E. Boydak (Turkey). Plant Pathology Journal, 5 (2): 157-160.

Seasonal variations of *Fusarium* species in wheat fields in Upper Egypt. 2006. Youssuf A. M. H. Gherbawy, Thanaa A. Maghraby, Yassmin M. Shebany (Egypt). Archives of Phytopathology and Plant Protection, 39(5): 365-377.

Seed transmission of *Verticillium dahliae* in olive as detected by a highly sensitive nested PCR-based assay. 2006. M.R. Karajeh (Jordan). Phytopathologia Mediterranea, 45: 15-23.

Significance Mycorrhizae. 2006. M.A. Turk, T.A. Assaf, K.M. Hameed and A.M. Al-Tawaha (Jordan & Canada). World Journal of Agricultural Sciences, 2(1): 16-20.

Temperature effect on mycelial growth and on disease incidence of *Fusarium oxysporum* f.sp. *radicis-lycopersici.* 2006. Khaled Hibar, Mejda Daami-Remadi, Hayfa Jabnoun-Khiareddine and Mohamed El Mahjoub (Tunisia). Plant Pathology Journal, 5 (2): 233-238.

Variation of cultural and morphological characteristics in *Fusarium* spp. causal agents of common root rot disease on wheat in Syria. 2006. M. El-Khalifeh, A. El-Ahmed, M. Yabrak and M. Nachit (Syria). Arab Journal of Plant Protection, 24: 67-74.

VIRUSES الفيروسات

An improved antiserum for sensitive serologic detection of *Chickpea chlorotic dwarf virus*. 2006. S.G. Kumari, K.M. Makkouk and N. Attar (Syria) Journal of Phytopathology 154(3): 129-133.

Biological and molecular characterization of Tunisian isolates of *Potato leafroll virus*. 2005. F. Djilani Khouadja, J. Rouze-Jouan, S. Guyader, M. Marrakchi and H. Fakhfakh (Tunisia & France). Journal of Plant Pathology, 87(2): 91-99.

Biological, serological, and molecular characterization of *Pepper mild mottle virus* (PMMoV) in Tunisia. 2006. M. Mnari-Hattab and K. Ezzaier (Tunisia). Tunisian Journal Plant Protection, 1: 1-12.

Decreased detectability of *Grapevine leafroll-associated virus 3* in Sakasly grapevines cultivated under the Sahara conditions. 2006. A. Ben Salem-Fnayou, P. Gugerli, H. Zemni, A. Mliki and A. Ghirbel (Tunisia & Switzerland). Journal of Phytopathology, 154(9): 528-533.

Distribution of tomato-infecting begomoviruses and *Bemisia tabaci* biotypes in Morocco. 2006. A. Tahiri, A. Sekkat, A. Bennani, M. Granier, G. Delvare and M. Peterschmitt (Morocco & France). Annals of Applied Biology, 149(2): 175-186.

Evaluation of the status of capsicum viruses in the main growing regions of Turkey. 2006. N. Buzkan, M. Demir, V. Öztekin, C. Mart, B. K. Çaglar and M. A. Yilmaz. (Turkey). EPPO Bulletin, 36(1): 15-19.

Expression of the coat protein gene of the Egyptian isolate of potato virus X in *Escherichia coli* and production of polyclonal antibodies against it. 2006. A. M. Soliman, B. N. Barsoum, G. G. Mohamed, A. K. EI-Attar and H. M. Mazyad (Egypt). Arab Journal of Biotechnology (Egypt), 9(1): 115-128

First report of a begomovirus associated with leaf curl disease of bell pepper in Pakistan. 2006. M. Tahir and M. S. Haider (Pakistan). Plant Pathology, 55(4): 570-570.

First Report of *Cucumber vein yellowing virus* on Cucumber, Melon, and Watermelon in Iran. 2006. K. Bananej, C. Desbiez, M. Girard, C. Wipf-Scheibel, I. Vahdat, A. Kheyr-Pour, A. Ahoonmanesh and H. Lecoq (Iran & France). Plant Disease, 90: 1113.

First report of *Mungbean yellow mosaic India virus* on mothbean in Pakistan. J. Qazi, S. Mansoor, I. Amin, M.Y. Awan, R. W. Briddon and Y. Zafar (Pakistan). Plant Pathology, 55(6): 818-818.

First report of *Tomato yellow leaf curl virus* on tomato in Libya. 2006. M. Zaied, J. Khalil and M. Shagrun (Libya). Arab Journal of Plant Protection, 24: 134.

Identification of viral diseases affecting barley and bread wheat crops in Yemen. 2006. S.G. Kumari, I. Muharram, K.M. Makkouk, A. Al-Ansi, R. El-Pasha, W. A. Al-Motwkel, A. Haj Kassem (Syria & Yemen). Australasian Plant Pathology, 35: 563-568.

Molecular Diagnosis of Plant Viruses. 2006. K.M. Makkouk and S.G. Kumari (Syria). Arab Journal of Plant Protection, 24: 135-138.

Molecular diagnosis of phytoplasmas. 2006. C. Marzachì (Italy). Arab Journal of Plant Protection, 24: 139-142.

Occurrence of *Prunus necrotic ringspot virus* and *Arabis mosaic virus* on Rose in Iran. 2006. F. Rakhshandehroo, H. R. Zamani Zadeh, A. Modarresi, and S. Hajmansoor (Iran). Plant Disease, 90: 975.

***Plum pox virus* mixed infection detected on apricot in Pakistan**. 2006. E. Kollerova, S. Novakova, Z. Subr, and M. Glasa (Slovakia). Plant Disease, 90:1108.

Presence of *Potato virus Y* and *Potato virus X* in Wright Ground Cherry Weed *(Physalis wrightii*, Gray) in Iraq. M.A. El-Muadhidi and S.A. Habib (Iraq). Arab Journal of Plant Protection, 24: 84-88.

Simultaneous and rapid differentiation of members of the *Tomato yellow leaf curl virus* complex by multiplex PCR. 2005. F. Gorsane, S. Gharasallah- Chouchene, M.K.Nakhla, I. Fekih-Hassan, D.P. Maxwell, M. Marrakchi and H. Fakhfakh (Tunisia & USA). Journal of Plant Pathology, 87(1): 43-48.

Typing of Egyptian *Citrus tristeza virus* (CTV) isolates based on the capsid protein gene. 2006. H.A. Amin, F. Fonseca, C. Santos and G. Nolasco (Egypt & Portugal). Phytopathologia Mediterranea, 45: 10-14.

Viruses infecting field-grown tomatoes in Samsun province, Turkey. 2006. Miray Arli-Sokmen and Mehmet A Sevik (Turkey). Archives of Phytopathology and Plant Protection, 39 (4): 283-288

Viruses of Pome fruit trees in Jordan. 2006. N. Salem, A. Mansour and A. Al- Musa (USA & Jordan). Journal of Plant Pathology, 87(2): 123-126.

Viruses on watermelon and melon crops in Syria: their spread, effect of grafting by using different rootstocks on viral infections, and ZYMV Transmission through Seeds. 2006. S. Al-Chaabi, M. J. Mando, F. Ismaeil and W. Ghazaleh (Syria). Arab Journal of Plant Protection, 24: 75-83.

BIOLOGICAL CONTROL مكافحة حيوية

Antagonistic actions of *Pythium oligandrum* and *Trichoderma harzianum* against phytopathogenic fungi (*Fusarium oxysporum* and *Pythium ultimum* var. *ultimum*). 2006. Momein H. El-Katatny, Hani M. A. Abdelzaher, Mahmoud A. Shoulkamy (Egypt). Archives of Phytopathology and Plant Protection, 39(4): 289-301.

Biological control of black mould rot of tomato fruits by yeasts. 2006. S.T. Shehata, M.A. Atwa and Late M.F. Hegazi (Egypt). Annals Agricultural Science, Ain Shams University, Cairo (Egypt), 51(1): 217-233.

Biological control of *Gaeumannomyces graminis* on wheat with *Bacillus* spp. 2006. E. Sari, H.R. Etebarian, A. Roustaei and H. Aminian (Iran). Plant Pathology Journal, 5 (3): 307-314.

Biological control of sclerotinia stem rot (*S. minor*) of sunflower using *Trichoderma* species. 2006. J. Abdollahzadeh, E. Mohammadi Goltapeh and H. Rouhani (Iran). Plant Pathology Journal, 5 (2): 228-232.

Ecologically–based Pprticipatory IPM in a global context: the IPM CRSP model. 2006. E.A. Heinrichs (USA). Arab Journal of Plant Protection, 24: 182-184.

Effect of *Bacillus thuringiensis* (Berliner) commercial formulations against the spiny-boll worm *Eariais insulana* (Boids.) (Lepidoptera: Noctuidae). 2006. S.M.T. Koja, G.N. Rezki, Madiha A. Rezk and H.E.M. Hanafy (Egypt). Annals Agricultural Science, Ain Shams University, Cairo (Egypt), 51(1): 261-269.

Effect of root-knot nematode *Meloidogyne javanica* on germination and different ages of soybean seedlings growth and its interaction with the fungi *Rhizoctonia solani* and *Macrophomina phaseolina*. 2006. Z.A. Stephan, H.B. Dawood and A.R. Nasir (Iraq). Arab Journal of Plant Protection, 24: 98-101.

Effects of some *Bacillus* sp. isolates on *Fusarium* spp. *in vitro* and potato tuber dry rot development *in vivo*. 2006. Mejda Daami-Remadi, Fakher Ayed, Hayfa Jabnoun-Khiareddine, Khaled Hibar and Mohamed El Mahjoub (Tunisia). Plant Pathology Journal, 5(3): 283-290.

Evaluation of the efficiency of the Coccinelllid *Serangium parcesetosum* Sicard (Coleoptera: Coccinellidae) for controlling *Bemisia tabaci* Genn. (Homoptera: Aleyrodidae). 2006. R. Aboud, M. Ahmed and N. Abou Kaf (Syria). Arab Journal of Plant Protection, 24: 107-111.

Interaction of horse-mint leaf extract with fungal antagonists on some legume seed borne fungi. 2006. A.R.T. Sarhan (Iraq). Arab Journal of Plant Protection, 24: 118-124.

IPM and organic farming. 2006. M.S. El-Zemaity (Egypt). Arab Journal of Plant Protection, 42: 174-177.

Laboratory evaluation for efficacy of two isolates of *Beauveria bassiana* on parasitizing third and forth instars larvae of the *Cydia pomonella* (L.). 2006. S.A. Khlaywi, H.F Alrubaei, I.J. Al-Jboory and Sh.A. Al-Tai (Iraq). Arab Journal of Plant Protection, 24: 102-106.

Lure and kill strategy: A promising safe approach to pest management that alleviates synthetic pesticides use. 2006. A. Rasmy (Egypt). Arab Journal of Plant Protection, 24: 159-161.

Microbial control of insect pests: is it an effective and environmentally safe alternative?. 2006. M.M. El-Husseini (Egypt). Arab Journal of Plant Protection, 42: 162-169.

Side effect of some Neem products on natural enemies of *Helicoverpa* (*Trichogramma* spp.) and *Chrysoperla carnea.* 2006. N. E. El-Wakeil, N. M. Gaafar, S. Vidal (Egypt & Germany). Archives of Phytopathology and Plant Protection, 39(6): 445-455.

Solarization and biofumigation reduce *Puthium aphanidermatum* iduced damping-off and enhance vegetative growth of greenhouse cucumber in Oman. 2006. G.M. Deadman, H. Al Hasani and A. Al Sa'di (Oman). Journal of Plant Pathology, 88(3).

The predation efficacy of the predators *Stethorus glivifrons* (Muls) and *Scolothrips sexmaculatus* (Perg.) on tobacco whitefly *Bemisia tabaci* (Gen) which attack cotton plants. 2006. S.S. Al-Duhawi, A.A. Ali and S.H. Sameer (Iraq). Arab Journal of Plant Protection, 24: 112-117.

The role of the different fermentation media and infection processes on the infectivity of the bacterial symbionts to *Spodoptera littoralis* (biosduval) (Lipedoptera: Noctuidae). 2006. A.S. Abdel-Razek (Egypt). Archives of Phytopathology and Plant Protection, 39(5): 353-363

Towards the biological control of post harvest blue mold of *Citrus sinensis* fruits in Egypt I-isolation and characterization of antagonistic strain of *Streptomyces alni.* 2006. Essam A. Azab, Soad M. Abu El-Souod, Mostafa A. El-Sayed and Mervat F. Fareed (Egypt). Pakistan Journal of Biological Sciences. 9(15): 2945-2956.

Use of non-chemical alternatives to synthetic pesticides in maintaining plant health in a clonally propagated crop: potato. 2006. E.B. Radcliffe (USA). Arab Journal of Plant Protection, 42: 170-173.

NEMATODES نيماتودا

Differential rate in spore attachment of seven isolated of *Pasteuria penetrans* on the root knot nematode *Meloidogyne javanica.* 2006. E.M. Mousa and M.E. Mahdy (Egypt). Journal of Nematology, 38(2): 284 (Abstract).

Infectivity of two Turkish isolated of *Steinernema feltiae* (Rhabditida: Steinernematidae) against *Rhagoletis cerasi and Ceratitis capitata.* 2006. I. Kepenekc and A. Susurluk (Turkey & Germany). Nematol. Medit., 34: 95-97.

WEEDS أعشاب

A contribution to the study of branched broomrape (*Orobanche ramosae*) in Syrian coast: distribution, host plants, and the potential role of *Phytomyza orobanchia* Kalt in biological control. 2006. Mohammad Ahmad, Bahaa Al-Rahban and Hanan Habak (Syria). Tishreen University for Studies and Scientific Research-Biology Science (Lattakia, Syria), 28(1): 145-160..

Herbicide resistant Egyptian barley cultivars by microprojectile bombardment of scutellar tissue. 2006. Shireen K. Assem, Ebtissam H.A. Hussein, Magdy A. Madkour and Al-Zahraa M.A. Radwan (Egypt). Arab Journal of Biotechnology (Egypt), 9(1): 159-174.

Response of onion (*Allium cepa* L.) plants to fertilizers, weed competition duration, and planting times in the central Jordan Valley. 2006. Jamal R. Qasem (Jordan). Weed Biology and Management, 6(4): 212-220.

PESTICIDES مبيدات

Effect of fungicides on *in vitro* infestation level of radish, carrot and pepper seeds. 2006. Naima Boughalleb, Neji Tarchoun and Wided Dallagi (Tunisia). Plant Pathology Journal, 5(3): 388-392.

Effect of paclobutrazol, plant growth retardant, on some soil-borne fungal pathogens *in vitro* conditions. 2006. Sahize Bolu and Ismail Cimen (Turkey). Plant Pathology Journal, 5(3): 393-396.

Efficacy of actara (Thiamethoxam) insecticide against soft scale insect *Exaeretopus tritici* (Williams) with special reference of its effect on the productivity of wheat and barley. 2006. S.I. Abdullah and I.J. Al-Jboory (Iraq). Arab Journal of Plant Protection, 24: 89-92.

Evaluation of fungicides for control of *Fusarium* wilt of potato. 2006. Plant Pathology Journal, 5 (2): 239-243.

***In vitro* and *in vivo* interaction of four fungicides with the *Fusarium* species complex causing tuber dry rot in Tunisia.** 2006. M. Daami-Remadi, H. Jabnoun-Khiareddine, F. Ayed and M. El Mahjoub (Tunisia). Plant Pathology Journal, 5(3): 362-367.

The effect of certain fungicides on mycoflora in the bean plant rhizosphere. 2006. Z.A. Al-Naser (Syria). Damascus University Journal for the Agricultural Science (Syria), 22(1): 165-180.

Toxicity evaluation of Avant, Buprofezin and Pyriproxifen pesticides against the *Phyllocnistis citrella* Stainton (Lepidptera: Gracillariidae). 2006. B. Amiri Besheli (Iran). Pakistan Journal of Biological Sciences, 9(13): 2483-2487.