ARAB AND NEAR EAST PLANT PROTECTION NEWSLETTER

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EDITORIAL

Scientific Specialized Books: A New Arab Society for Plant Protection Endeavor

Few years ago, the Arab Society for Plant Protection (ASPP) Publications Committee in its meeting held in Aleppo, Syria on July 22, 2004 launched the idea of producing specialized books in plant protection covering the Arab region, and developed general guidelines for producing such books to be followed by the editors and authors of the nine ASPP approved books. The Publications Committee and the books editors were aware of the magnitude of effort required to produce such books, however, few had realistic estimate on what it takes to produce such publications. In 2009, two books were published, one on virus diseases and the other on nematode diseases of economically important crops in the Arab region. Both books were on sale during the 10th Arab Congress of Plant Protection held in Beirut, Lebanon, October 26-30, 2009. The remaining books are now at different stages of completion. ASPP publications were the topic for discussion in a round table session during the congress and a unanimous decision was made to move forward with the publication of the remaining approved books in the near future.

Personally, I was extremely satisfied and proud when I saw the nematology book available for distribution during the congress, not because the work of very long four years is over, but because I felt together with the book co-editors, authors and co-authors that we produced a book of high international standards. I am sure that our colleagues involved in the virology book share with us such feelings.

It is important at this stage to ask "what is the importance of such a step, and what are the objectives and future inspirations for such a project??" It is essential to point out the following:

- In each of these books, reference is made to most of the research work conducted in the Arab region. This is extremely important for scholars to be aware of the work done, who did it and where.
- In writing each book there is a high number (20-40) of experienced and specialized professionals who contributed to the different chapters of each book and from different Arab countries. This is now the present international trend in publishing professional books.
- In addition to the general principles covered in these books, there is a complete citations for published work in all book chapters, similar to what is followed in producing review articles in respected scientific journals.
- The books are written in Arabic, similar to all ASPP publications, to enrich the "Arabic library" with scientific books which will facilitate teaching in Arabic these sciences at the university level.
- Finally, such books will permit graduate students to familiarize themselves with what has been done in the different plant protection disciplines before deciding on the outline of their thesis research.

It is hoped that the colleagues involved in writing the seven books in the pipe line to maximize their effort to complete these books in the near future. In addition, it is hoped that such books will re present a model to follow in agricultural sciences other than plant protection.

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DISEASE AND PEST OUTBREAKS

EGYPT

First Record of *Oidiopsis taurica* Causing Powdery Mildew of *Capparis spinosa* in Egypt. Powdery mildew infections were observed on *Capparis spinosa* plants in Wadi El-Arbaein, Saint Katherine Protectorate, Egypt (28°32′43.1″N, 33°57′81″E, altitude 1,663 m) in the early fall to the end of winter of 2007 and 2008 when temperatures vary from the lowest mean value of 2.8°C to the highest mean value of 26.5°C. Symptoms first appeared as white, circular patches on the adaxial leaf surface (<1.3 cm in diameter), and as the disease progressed, both leaf surfaces were infected and these chlorotic areas eventually turned to necrotic lesions. Light microscopy revealed that the disease was caused by the anamorph stage of a powdery mildew fungus. Mycelium is predominantly endophytic with the presence of conidiophores emerging through leaf stomata. Conidiophores were simple or branched one or two times at random positions, 55 to 140 × 4.5 to 6 µm, producing conidia singly, and followed by two to three straight cells. Primary conidia were pyriform (68.9 × 18.5 µm) with a tapering end while secondary conidia were more cylindrical (59.1 × 18.0 µm). Mature conidia were hyaline, without distinct fibrosin bodies, and with angular/reticulated wrinkling of the outer walls. On the basis of these characteristics, the causal agent was identified as *Oidiopsis taurica*. The teleomorphic stage of the fungus was not observed. Pathogenicity tests were performed by inoculating three, potted, healthy *C. spinosa* plants with a fresh conidial suspension collected from powdery mildew colonies found on the infected plants (1×10^4 conidia/ml) under the same field conditions. After 15 to 17 days, symptoms and signs of powdery mildew developed on the foliage of inoculated plants. Herbarium specimens of *C. spinosa* leaves infected with *O. taurica* were deposited at the Herbarium of Botany Department (SCU), Faculty of Science, Suez Canal University, Egypt. To our knowledge, this is the first record of a powdery mildew disease on *C. spinosa* in Egypt. Recently, *Leveillula taurica*, the teleomorph stage of *O. taurica*, was reported from *C. spinosa* in Turkey. [A.M. Abdel-Azeem and T.S. Abdel-Moneim. (Egypt). Plant Disease, 93(5):555. 2009].

IRAN

Detection of Wheat Stem Rust (*Puccinia graminis* f. sp. *tritici*) Race TTKSK (Ug99) in Iran. In 2007, new reports of stem rust caused by *Puccinia graminis* Pers. f. sp. *tritici* Eriks. in Lorestan and Hamadan provinces of Iran were considered unusual because stem rust had not been recorded previously in the Hamadan area where winter habit wheat cultivars are grown. Detailed investigations in these areas showed significant levels of stem rust in experimental plots and occasionally in farmers' fields, some that showed moderate to high levels of infection. Race analysis of four stem rust samples collected from Borujerd, Hamadan, and Poldokhtar (southwest) and Kelardasht (north) in 2007 was conducted using a modified North American *Pgt* differential set representing the resistance genes *Sr5, 6, 7b, 8a, 9a, 9b, 9d, 9e, 9g, 10, 11, 17, 21, 24, 30, 31, 36, 38, Tmp*, and *McN*, commercial cultivars, and genotypes known to carry the 1B.1R translocation. A race collected from Borujerd in 1997 was also included for comparison. Tests were carried out under standard controlled conditions (1,2). Two isolates from samples collected from Borujerd and Hamadan in 2007 showed high infection types (ITs 33^+ to 4) on differential lines carrying resistance genes *Sr5, 6, 7b, 8a, 9a, 9b, 9d, 9e, 9g, 10, 11, 17, 21, 30, 31, 38*, and *McN*, and low ITs of ;$C1^=$ to $2^=$, ;C to ;$N1^=$, and 2^+ on lines carrying *Sr24, Sr36*, and *SrTmp*, respectively. On the basis of the high/low ITs on the 20 differentials in the modified *Pgt* differential set of North America, the two isolates of *Pgt* collected from Borujerd and Hamadan in 2007 were identified as race TTKSK. The two isolates from samples collected from Poldokhtar and Kelardasht in 2007 and the isolate collected from Borujerd in 1997 were identified as races TRFSC, TTJQC, and RRHSC, respectively. Race TTKSK identified in the current study produced high ITs of 3^+ to 4 on the wheat genotypes Line E*4/Kavkaz, Fed.*4/Kavkaz, Clement, and Mildress and commercial cultivars Falat (Seri 82), Shiroodi (CIMMYT name Attila and Indian name PBW343), Atrak (Kauz), and MV17, all carrying the 1BL.1RS translocation and further confirming virulence for *Sr31*. The spread of Ug99 to Kenya (1999 to 2002), Ethiopia (2003), and Yemen (2006) suggests progressive migration from Uganda, following the pattern believed to have occurred for the spread of wheat stripe rust pathogen from East Africa in 1986 to India in 1998 (3). Our results are consistent with the TTKSK race identified in Iran migrating from the new African population. Seedling evaluation of Iranian wheat cultivars and advanced lines to isolates of TTKSK from Iran confirmed full susceptibility. These results reinforce the serious threat of race TTKSK to wheat production in Iran. In conclusion, the occurrence of race TTKSK in Iran, the susceptibility of Iranian wheat cultivars to this race, the presence of environmental conditions conducive to disease epidemics in different parts of the country, and the occurrence of the alternate host barberry in many of the mountainous areas of Iran, indicate a new and serious threat to wheat production in Iran and a potentially serious threat to neighboring countries. [K. Nazari**,** M. Mafi**,** R.P. Singh and R.F. Park**.** (Iran & Australia). Plant disease, 93(3):317, 2009].

Identification, Distribution and Incidence of Viruses in Field-grown Cucurbit Crops of Iran. A survey of viruses in the major cucurbit-growing areas of 17 provinces in Iran was conducted in 2005 and 2006. A total of 1699 leaf samples were collected from melon, squash, cucumber and

watermelon plants showing various virus-like symptoms. Screening for 11 cucurbit viruses by double-antibody sandwich ELISA (DAS-ELISA) or RT-PCR, found that 71% of the samples were infected by at least one virus, of which *Cucurbit aphid-borne yellows virus* (CABYV) was the most common overall, occurring in 49, 47, 40, and 33% of cucumber, squash, melon, and watermelon samples respectively. The second most common virus on melon and watermelon was *Watermelon mosaic virus* (WMV) (incidence 30-33%); on cucumber, *Cucumber mosaic virus* (CMV) (33%); and on squash, *Zucchini yellow mosaic virus* (ZYMV) (38%). To our knowledge, this is the first report of *Melon necrotic spot virus* (MNSV) and *Zucchini yellow fleck virus* (ZYFV) in Iran. Mixed infections occurred in 49% of symptomatic samples. Mixed infections were relatively frequent in squash (58%) and melon (55%). The most frequent double infections were WMV +CABYV and ZYMV+CABYV in melon, squash and cucumber, followed by WMV+ZYMV. In watermelon, the most frequent double infection was WMV+ZYMV, followed by WMV+CABYV. The high frequency of CABYV, WMV and ZYMV in the samples assayed on all four cucurbit crops and in all areas surveyed, as well as the detection of *Watermelon chlorotic stunt virus* (WmCSV) and *Cucumber vein yellowing virus* (CVYV) in northern and southern Iran, suggest that these viruses represent a potential threat to cucurbit crops in Iran. [K. Bananej and A. Vahdat. (Iran). Phytopathologia Mediterranean, 47:247-257, 2008].

Incidence of Viruses Infecting Tomato and Their Natural Hosts in the Southeast and Central Regions of Iran. A survey was conducted to determine the incidence of *Cucumber mosaic virus* (CMV), *Beet curly top virus* (BCTV), *Tomato yellow leaf curl virus* (TYLCV), *Tomato chlorotic spot virus* (TcSV), *Potato virus Y* (PVY), *Potato virus S* (PVS), *Tomato spotted wilt virus* (TSWV), *Tomato ringspot virus* (TRSV), *Tomato aspermy virus* (TAV), *Arabis mosaic virus* (ArMV), *Tobacco streak virus* (TSV), *Tomato bushy stunt virus* (TBSV), *Tobacco mosaic virus* (TMV), and *Tomato mosaic virus* (ToMV) on tomato (*Solanum lycopersicum*) in the major horticultural crop growing areas in the southeast and central regions of Iran. A total of 1,307 symptomatic leaf samples from fields and 603 samples from greenhouses were collected from January 2003 to July 2005 in five southeastern and central provinces of Iran. Samples of symptomatic plants were analyzed for virus infection by enzyme-linked immunosorbent assay (ELISA) using specific polyclonal antibodies. ArMV and CMV were the most frequently found viruses, accounting for 25.6 and 23.4%, respectively, of the collected samples. BCTV, TSWV, TMV, PVY, ToMV, and TYLCV were detected in 6.1, 5.8, 5.6, 5, 4.8, and 1.6% of the samples, respectively. TBSV, TAV, TSV, PVS, and TRSV were not detected in any of the samples tested. Double and triple infections involving different combination of viruses were found in 13.9 and 1.7% of samples, respectively. This is the first report of PVY and ArMV as viruses naturally infecting tomato in Iran. Infection of tomato plants with PVY and ArMV was confirmed. Six out of 20 plant species belonging to six genera, growing in tomato fields or in the nearby areas, were found infected with TSWV, TMV, PVY, and CMV. [H. Massumi, M. Shaabanian**,** A.H. Pour**,** J. Heydarnejad and H. Rahimian. (Iran). Plant disease, 93(1):67-72, 2009].

Nematodes Associated with Flowering Ornamental Plants in Mahallat, Iran. In a survey conducted in June 2005 through May 2006, twenty-one nematode species were found associated with ten flowering ornamental plant species cultivated in Mahallat, Iran. *Aphelenchus avenae, Aphelenchoides subtenuis, Boleodorus thylactus, Ditylenchus kheirii, D. myceliophagus, Filenchus sandnert, Irantylenchus vicinus, Helicotylenchus crassatus, H. crenacauda, H. digonicus, H. pseudodigonicus, H. pseudorobustus, H. vulgaris, Merlinius brevidens, Paratylenchus similis, Pratylenchus neglectus, P. penetrans, P. thornei, Tylenchorhynchus dubius* and *Zygotylenchus guevarai* varied in their frequency of distribution amongst the ten plant species. This is the first report of nematodes found associated with ornamental plants in Mahallat, Iran, and the first detection of six nematode species in Iran. Morphological and morphometric variations that typified the Mahallat populations are given and discussed for certain nematode species. Similarities to *Tylenchorhynchus dubius* and *T. canalis* were observed in a population of *Tylenchorhynchus* and, consequently, *T. canalis* is herein proposed as a junior synonym of *T. dubius.* [A. Mohammad DeimP., J.J. Chitambar and Z.T. Maafi. (Iran). Nematologia Mediterranean, 36:115-123, 2008].

IRAQ

Preliminary Notes on the Identification of the Native Species of *Trichogramma* evanescens (Westwood) (Trichogrammatidae: Hymenoptera) as an Egg Parasitoid on the Spiny Bollworm in Iraq. Egg parasitoids are considered as an effective biological control agents against many agricultural pests. The native species are mostly preferred on the imported species in many successful releases of biological control applications. Several field surveys were conducted in cotton fields grown in Abu-Ghraib, Baghdad and in Karkok region during the growing seasons of 2000 to 2007. Survey results indicated the presence of the egg parasitoid *Trichogramm evanescens* Westwood. Identification was confirmed by the British Natural History Museum depending on biotechnology techniques using DNA as indicator. The parasitoid was found in samples collected from Abu-Ghraib. Since this parasitoid did not mentioned previously in the country, therefore, present finding could be considered as a first record for this parasitoid on the egg of the spiny bollworm in Iraq. However, percent parasitism was relatively low reaching about 3%. Therefore, a mass rearing program can be initiated for this parasitoid to be used in undative release program for controlling the spiny bollworm on cotton or other lepidopterous pests infesting many agricultural crops in Iraq. [H.M. Hussain, A.S.A. Ali and J.K. Mohammed. (Iraq), Anbar Journal for Agricultural Sciences, 7(3), 2009]

PAKISTAN

First Report of *Alternaria alternata* Causing Leaf Spot on *Rumex dentatus* in Pakistan. *Rumex dentatus* L., commonly known as toothed dock, is an annual and biennial weed in the Polygonaceae. It is reported to be native to southern and eastern Asia and is now established in North America (southern Arizona and Sonora and Baja California) and Europe (Russia, Bulgaria, Greece, and Romania) (1,3). In Pakistan, *R. dentatus* is one of the most common and problematic weeds in wheat fields (2). In surveys of wheat-growing areas in Punjab Province conducted from 1999 to 2002, leaf spots were found to be very common on *R. dentatus*. The disease led to 10 to 70% mortality of *R. dentatus* in various fields in Lahore and Kasur districts. Symptoms initially were small, light brown, circular spots with most becoming irregular, dark brown lesions, while a few remained circular with concentric rings. On severely diseased leaves, several spots coalesced to form large necrotic areas. Leaf spots varied from 2 to 24 mm in diameter. The disease first appeared in mid-February, was widespread from the end of February through March when temperatures ranged from 25 to 30°C, and ended in April. Diseased leaves were cut into small fragments, surface disinfested with 1% sodium hypochlorite, rinsed thrice with sterile water, and cultured on potato dextrose agar in a growth incubator at 25 ± 1°C. The isolated fungal species was transferred to agar slants to maintain pure cultures. The fungal colony surface was grayish white, and then darkened, becoming greenish black or olive-brown with a light border. The fungus produced abundant, branched, septate, brownish hyphae with simple, olive-brown, septate conidiophores that were variable in length. Conidia were terminal, solitary, or in short chains, mostly ovoid with a short conical or cylindrical apical beaks not exceeding one-third of the conidial length, and smooth walled or vemuculose. On the basis of morphological characteristics, the fungus was identified as *Alternaria alternata* by the Fungal Culture Bank of Pakistan (FCBP). A specimen of the fungal culture was deposited in FCBP. For the pathogenicity test, *R. dentatus* plants grown outdoors from seed to three- to four-leaf stages were transplanted into 12-cm-diameter plastic pots, two plants per pot. Plants were sprayed with a suspension of the putative pathogen containing 1×10^7 conidia per ml. Control plants were sprayed with sterile water. Each treatment was replicated three times. Plants were covered for 24 h with plastic bags to maintain 100% relative humidity. The bags were removed and plants returned outdoors. All of the inoculated plants showed the same symptoms as observed on diseased plants in the field. The lesions first appeared after 7 days. The pathogen was consistently reisolated from the lesions. The pathogenicity tests were repeated three times. Given the effects of *A. alternaria* on *R. dentatus* observed in the field, there is potential for using the fungus as a biological control of the weed. [I. Siddiqui, R. Bajwa and A. Javaid. (Pakistan). Plant Disease, 93(4): 431, 2009].

SAUDI ARABIA

First Report of Bacterial Leaf Spot of Lettuce (*Lactuca sativa*) Caused by *Xanthomonas campestris* pv. *vitians* in Saudi Arabia. In April of 2008, lettuce (*Lactuca sativa* L. cv. Darkland) plants grown in the Al-Ouunia Region of Saudi Arabia were observed with numerous lesions typical of bacterial leaf spot. Leaf lesions were irregular, small, pale green to black, and 2 to 5 mm in diameter. Bacteria were isolated from diseased leaf tissues by cutting leaves into small pieces (0.5 mm) and soaking them in 2 ml of sterile distilled water. The resulting suspension was streaked onto yeast dextrose calcium carbonate agar (YDC) and plates were incubated at 28°C. Large, round, butyrus, bright yellow colonies typical of *Xanthomonas* spp. formed after 48 h and five strains were selected for further tests. A yellow, mucoid bacterium was consistently isolated from lettuce samples with typical bacterial leaf spot symptoms. All five strains tested in this study were gram negative, oxidase negative, nitrate reduction negative, catalase and esculin hydrolysis positive, motile, and strictly aerobic. All were slightly pectolytic but not amylolytic. All were identified as *Xanthomonas campestris* pv. *vitians*. The bacterium was identified with specific oligonucleotide primers. This primer pair directed the amplification of an approximately 700-bp DNA fragment from total genomic DNA of all *X. campestris* pv. *vitians* strains tested. Pathogenicity tests were performed by using bacterial cultures grown on YDC for 48 h at 28°C. Each strain was suspended in sterile distilled water and the bacterial concentration was adjusted to 10^6 CFU/ml. Leaves of 5-week-old lettuce plants (cv. Darkland) were sprayed with the bacterial suspension. The inoculated and sterile-water-sprayed control plants were covered with polyethylene bags for 48 h at 25°C, after which the bags were removed and plants were transferred to a greenhouse at 25 to 28°C. All strains were pathogenic on the lettuce cv. Darkland, causing typical bacterial leaf spot symptoms by 2 weeks after inoculation. All inoculated plants showed typical symptoms of bacterial leaf spot and symptoms similar to those observed on the samples collected. No symptoms developed on the control plants. The bacterium was reisolated from inoculated plants and identified as *X. campestris* pv. *vitians* by morphological, physiological, and biochemical tests as described above. To our knowledge, this is the first report of bacterial leaf spot of lettuce by *X. campestris* pv. *vitians* in Saudi Arabia. [M. Al-Saleh and Y. Ibrahim. (Saudi Arabia). Plant disease, 93(1):107, 2009].

SYRIA

First Report of Chickpea Wilt Caused by *Clonostachys rhizophaga* in Syria. In 2007 and 2008, disease symptoms were observed on four cultivars of chickpea (*Cicer arietinum* L.), including two of the most popular cultivars grown in Syria (Ghab 3 and Ghab 4), in a replicated on-farm trial conducted in the fertile Al Ghab Plains. Affected plants exhibited chlorosis of the foliage, vascular

discoloration, and death. In both years, plant mortality reached 100% in plots of cvs. ICC 12004, Ghab 3, and Ghab 4, but only 60% in plots of cv. ILC 97-706. Five monosporic isolates obtained from surface-disinfested stems and roots were identified morphologically. All micromorphological characteristics indicated that the isolated fungi fit the description of *Clonostachys rhizophaga* Schroers (1). Wilting of chickpea was widespread in the area, and fungal isolations from a random sample of diseased plants in neighboring farmers' fields revealed the presence of *C. rhizophaga*. In culture, isolates formed dimorphic, *Verticillium*-like (primary) or penicillate (secondary) conidiophores and ovoidal to elongate, slightly curved or asymmetrical, 5 to 9 µm long and 2.5 to 3.5 µm wide conidia showing a slightly laterally displaced hilum. The identification of the five isolates as *C. rhizophaga* was supported by sequencing approximately 600 bp of the β-tubulin gene (*tub2*). Two representative sequences have been deposited under GenBank, Accession No. FJ593882 for strain CBS 124507 and No. FJ593883 for CBS 124511. Both were 100% similar to the sequence of *C. rhizophaga* strain CBS 361.77 (GenBank Accession No. AF358158) but differed by a deletion of 2 nucleotides relative to the ex-type strain of *C. rhizophaga*, CBS 202.37 (GenBank Accession No. AF358156). Two methods were used to inoculate plants and complete Koch's postulates. Method 1 used a 10-mm-diameter mycelial plug to inoculate healthy 3-day-old seedlings grown on 40 ml of Hoagland nutrient agar medium in a glass tube (one seedling per tube). The plug was placed mycelial-side down on the surface of the medium, and the fungus subsequently colonized the medium and penetrated the plant roots. Method 2 involved mixing autoclaved seed that had been colonized by each isolate with sterilized soil (1:12 vol/vol) prior to transplanting healthy seedlings into the soil mix. Thirty plants of each cultivar were tested per isolate per method, and controls received sterile agar plugs or autoclaved chickpea seed only. Irrespective of inoculation method, all five isolates caused wilt and plant death of all cultivars within 15 days (method 1) or 2 months (method 2) postinoculation. Symptoms were similar to those originally observed in the field and controls remained healthy. *C. rhizophaga* was recovered from all affected plants. To our knowledge, this is the first report of *C. rhizophaga* as a pathogen of chickpea. In an earlier report, *C. rhizophaga* (as *Verticillium rhizophagum* Tehon & Jacobs, *nom. invalid*.) was identified as the causal agent of a disastrous disease of *Ulmus americana* in Ohio. *C. rhizophaga* has been reported from Chile, Ecuador, the United States, and Switzerland. [M.M. Abang, S. Kabbabeh, S. Ahmed, S. Murad and H.-J. Schroers, (Syria & Slovenia). Plant disease, 93(6):666, 2009].

TUNISIA

First report of Shoot Blight and Dieback Caused by *Diplodia pinea* on *Pinus pinaster* and *P. rediata* Trees in Tunisia. Damage caused by *Diplodia pinea* on *Pinus pinaster* and *P. radiata* forests are reported for the first time in Tunisia. The affected plants show shoot blight, canker and branch dieback. On decaying and dead branches pycnidia of *D. pinea* are observed. The fungus was repeatedly isolated from the bark of symptomatic branches. The results of pathogenicity tests confirm the virulence of *D. pinea* and the susceptibility of both *Pinus* species to infection. [B. Linaldeddu, F. Hasnaoui and A. Franceschini. (Tunisia & Italy). Phytopathologia Mediterranean, 47:258-261, 2008].

First report of *Pseudocercospora claclosporioicles,* the Causal Agent of Cercospora Leaf Spot of Olive Trees, in Tunisia. Olive trees *(Olea europaea)* cv. Meski having leaves with yellow spots on the upper surface and grey blotches on the lower surface were found in three orchards located in the regions of Take Is a, Testour and Enfidha, central and northern Tunisia. The shoots of the olive trees had also become defoliated indicating a severe attack of a pathogen. *Pseudocercospora cladosporioides* was isolated from symptomatic leaves and Koch's postulates were fulfilled. This is the first Tunisian report of *P. cladosporioides* causing Cercospora leaf spot of olive trees. [M.A. Triki and A. Rhouma. (Tunisia). Phytopathologia Mediterranean, 47:262-265, 2008].

Molecular Characterization of *Bemisia tabaci* Biotypes in Southern Tunisia. The molecular characterization of *Bemisia tabaci* (Gennadius) populations collected from 9 sites in southern Tunisia (8 from geothermal areas and one from Douz oasis) using the Bem-23 microsatellite marker showed the presence of biotype "B" in 7 of the 8 geothermal sites. Indeed, the *B. tabaci* populations found in the sites of Jemma, Steftimi, Saïdane, Oum EL Farth, Kébili, Limaguès and Chenchou, exhibit the 220 base pair bands that are typical for this biotype. However, in the geothermal site of Douz and the Bazma oasis, the *B. tabaci* population is present as a mixture of biotype "B" and "Q" as revealed by the 410 base pair bands. [M.S. Bel-Kadhi, J.C. Onillon and J.L. Cenis (Tunisia, France & Spain). Tunisian Journal of Plant Protection, 3(2):79-85, 2008].

TURKEY

First Report of *Potato spindle tuber viroid* in Cape Gooseberry (*Physalis peruviana*) from Turkey and Germany. Since the recent identification of *Potato spindle tuber viroid* (PSTVd) in vegetatively propagated ornamental plant species (4), many growers have asked to have their mother plants tested for this viroid. In December of 2007, a grower from Turkey submitted cuttings of cape gooseberry (*Physalis peruviana*) to be tested for PSTVd. Initial testing by real-time reverse transcription (RT)-PCR according to Boonham et al. (1) indicated the presence of either *Mexican papita viroid*, PSTVd, or *Tomato chlorotic dwarf viroid* in four samples. To identify the viroid(s) present, isolated RNA from these samples was used for RT-PCR (2), and products of the expected full genome size for the three viroids were amplified from each sample. One of the PCR products was sequenced (GenBank Accession No. EU862230) and analysis of the 357 nt sequence indicated it was most related to PSTVd sequences belonging to the so-

called 'Oceanian' strain of the viroid (3), with 99.7% identity to GenBank Accession No. AY962324. Therefore, the viroid was identified as PSTVd. Pathogenicity of this PSTVd genotype was demonstrated when 4 weeks after mechanical inoculation with sap extracts seedlings of tomato cv. Money-maker showed the expected viroid symptoms of chlorosis and stunting, and the presence of the viroid in these plants was confirmed by RT-PCR (2). In March of 2008, by use of RT-PCR (2) and sequencing of the PCR product (GenBank Accession No. EU862231), PSTVd was identified in young seedlings of *P. peruviana* from a German grower. The German isolate differed at only three nucleotide positions from the Turkish isolate. The identification of PSTVd in young seedlings indicates that seeds had been source of infection, whereas in the case of the PSTVd infected cuttings from Turkey, the infection originated from infected mother plants. To our knowledge, these are the first reports of PSTVd in *P. peruviana*. Although infected *P. peruviana* plants did not show symptoms, they might act as sources of inoculum for crops like potato and tomato, which may suffer serious damage. [J.Th.J. Verhoeven**,** M. Botermans**,** J.W. Roenhorst**,** J. Westerhof and E.T.M. Meekes. (Turkey & Netherland). Plant disease, 93(3):316, 2009].

First Report of Columbia Root-Knot Nematode (*Meloidogyne chitwoodi*) in Potato in Turkey. Columbia root-knot nematode, *Meloidogyne chitwoodi*, was identified from potatoes, *Solanum tuberosum* L., collected from Nigde Province, Turkey in September 2006. Seed potatoes are the most likely source for this introduction. The nematode is currently found to be infecting potatoes grown in the Netherlands, Portugal, Belgium, Germany, the United States, Mexico, South Africa, and Argentina. *M. chitwoodi* acquired a quarantine status in Europe because of its potential to become established worldwide and its high damage probability. Some countries prohibit import of both seed and table stock potatoes originating in states known to harbor *M. chitwoodi*. Lesions on the potatoes had discrete brown coloration with white central spots in the outer 1 cm of the tuber flesh. Female nematode densities averaged 3 to 5 per cm^2 of a potato section beneath the lesions. Nematodes were morphologically identified as *M. chitwoodi* based on the perineal pattern of mature females and the tail shape of juveniles. Using PCR-restriction fragment length polymorphism of the 18S region and the mtDNA COII-16S rRNA region and intergenic spacer region between the 5S and 18S genes, individual juveniles were identified as *M. chitwoodi* based on their restriction fragment patterns. To our knowledge, this is the first report of Columbia root-knot nematode infecting potatoes in Turkey. The distribution of this nematode in potato fields throughout Turkey should be determined. [A. Ozarslandan**,** Z. Devran**,** N. Mutlu and I. H. Elekcioglu. (Turkey). Plant Disease, 93(3):316, 2009].

First Report of *Onion yellow dwarf virus* and *Leek yellow stripe virus* in Garlic in Turkey. Garlic (*Allium sativum* L.) is one of the most important *Allium* spp. plants that are widely cultivated throughout the world. A significant reduction in yield and quality due to virus infection is now a serious economic problem. In many cases, garlic plants are infected with a variety of viruses, but elimination of these viruses is difficult because this crop is propagated through bulbs. Potyviruses, carlaviruses, and allexiviruses have been detected in diseased garlic. *Onion yellow dwarf virus* (OYDV) and *Leek Yellow Stripe Virus* (LYSV), genus *Potyvirus*, family *Potyviridae*, are two important viral pathogens of garlic. Virus diseases of garlic are widespread in the world, causing serious damage to yields and quality of the crop. The East Mediterranean Region produces 14% of the garlic production of Turkey (110,000 t). A survey was done in garlic fields in Adana, Mersin, Kahramanmaras, Hatay, and Gaziantep provinces of Turkey where virus-like symptoms were noted in samples collected during the 2007–2008 growing season. Leaf and bulb samples were taken from 202 plants with leaf yellow stripe, mosaic, enations, and deformation or dwarfism symptoms. ELISA was performed with antibodies from Agdia (Elkhart, IN). Results indicated that 57 samples (28.2%) were infected with OYDV and 43 samples (21.2%) were infected with LYSV. In addition, 23 samples were determined to be infected by both viruses. All ELISA-positive samples and 10 ELISA-negative samples were analyzed by reverse transcription-PCR with primers 1OYDV-G (5′ TTA CAT TCT AAT ACC AAG CA 3′) and 2OYDV-G (5′ GCA GGA GAT GGG GAG GAC GC 3′) for the detection of OYDV and primers 1LYSV (5′ TCA CTG CAT ATG CGC ACC AT 3′) and 2LYSV (5′ GCA CCA TAC AGT GAA TTG AG 3′) for the detection of LYSV. These primers were previously reported to be specific for the coat protein genes of OYDV and LYSV, respectively. Products of the expected size (774 bp for OYDV and 1,020 bp for LYSV) were amplified only from the ELISA-positive samples of the respective viruses, confirming infections by OYDV and LYSV. To our knowledge, this is the first report of OYDV and LYSV in garlic in Turkey. [H. Fidan, S. Baloglu. (Turkey). Plant Disease, 93(6):672, 2009].

RESEARCH HIGHLIGHTS

ALGERIA

Effect of Pea Cultivar, Pathogen Isolate, Inoculum Concentration and Leaf Wetness Duration on Ascochyta Blight Caused *by Mycosphaerella pinodes*. The effect of host leaf wetness duration, *Mycosphaerella pinodes* inoculum concentration and pathogen isolate on the latent period and the incubation period of the pathogen or disease severity were quantified on pea *(Pisum satiuum* L.). Seedlings of two widely grown pea cultivars, Onward and Merveille de Kelvedon, respectively susceptible and moderately resistant to *M. pinodes* were subjected to six leaf wetness durations of 6, 12, 24, 48 and 72 h, and inoculated with five inoculum concentrations, 2.5×10^3, 4×10^4 3.5×10^5, 4×10^6, and 5.2×10^7, in order to determine whether the cultivars reacted differently to *M. pinodes* isolates inoculated under identical conditions. Increasing the duration of leaf wetness and inoculum concentration

caused significant (P<0.001) increases in disease severity within each cultivar. Both the incubation period and the latent period decreased with increasing conidial concentration and leaf wetness duration. Generally, the cv. Onward had a significantly shorter incubation period, and latent period and higher disease severity than cv. Merveille de Kelvedon. Isolates differed in aggressiveness at higher levels of leaf wetness (48 h) duration and of inoculum concentration (4×10^6), but there was no significant interaction between isolates and leaf wetness duration, or between isolates and inoculum concentration. The optimum levels for obtaining a consistent infection and for readily separating the susceptible and the partially resistant cultivars were a leaf wetness of 48 h and an inoculum concentration of 4×10^6. The study also showed that continuous leaf wetness for 48 h was a threshold for application of fungicides to control the fungus in the susceptible cultivar. [B. Setti, M. Bencheikh, J. Henni and C. Neema. (Algeria). Phytopathologia Mediterranean, 47:214-222, 2008].

EGYPT

Integrated Control of Cotton Root Rot Disease by Mixing Fungal Biocontrol Agents and Resistance Inducers. The aim of this study was to evaluate mixtures of bioagents and resistance inducers for protection of cotton roots against root infecting fungal pathogens. Three biological control agents (BCAs); *Trichoderma hamatum* (TM), *T. harzianum* (TZ) and *Paecilomyces lilacinus* (PL) and two resistance inducers (RIs); Bion (benzo(1,2,3) thiadiazole-7-carbothioic acid S-methyl ester) (BTH), salicylic acid (SA) were applied individually or in combination to test their efficacy in controlling cotton root rot disease caused by *Fusarium oxysporum* (FO) and *Pythium debaryanum* (PD) under greenhouse and field conditions. In greenhouse experiments, all applied treatments protected cotton seedlings against FO root rot. Disease index percentage (DI %) was significantly reduced up to 78.8%, while germination percentage increased significantly up to 199.60% compared with the infected control. All treatments significantly reduced PD DI% compared to infected controls. In field experiments, the maximum protection of cotton roots against FO and PD resulted from application of TM + PL + SA + BTH, where DI% was reduced to 72.3% and 69.3% relative to infected controls, respectively. Increase in cell wall fractions (cellulose, hemicelluloses and lignin) resulted from application of both BCAs and RIs in case of PD. Lignin content significantly increased 1.68–1.93 (FO) and 1.07–1.39 (PD) fold over the infected controls. A significant increase in free phenolics content was positively proportional to the degree of plant resistance against the two pathogens. The main conclusion of this study is that by combining BCAs with RIs there was increased consistency of suppression of root rot of cotton seedlings caused by either *F. oxysporum* or *P. debaryanum.* [Kamal A.M. Abo-Elyousr, M. Hashem and E.H. Ali (Egypt), Crop Protection, 28(4): 295-301, 2009].

Acaricidal Potential of Some Essential Oils and their Monoterpenoids Against the two-spotted Spider Mite *Tetranychus urticae* (Koch.). The acaricidal potential of fourteen essential oils and fourteen of their major monoterpenoids were tested against the Two-spotted spider mite *Tetranychus urticae*. Two different time intervals of 24 and 48 hrs were used in evaluation. The assays after 24 hrs showed that mattercary, fennel, caraway, garlic, cinnamon, chenopodium and eucalyptus were highly potent. As for monoterpenoids, chlorothymol was found to be the most effective against *T. urticae* followed by thymol, carvacrol and cinnamaldehyde. [Saad R. El-Zemity, Hussain A. Rezk and Ahmed A. Zaitoon (Egypt), Archives of Phytopathology and Plant Protection, 42(4): 334-339, 2009].

Watermelon Resistances to Fusarium Wilt Via Tissue Cultures Technique. Under *in vitro* conditions resistant calli were selected from explants of watermelon under challenging stress of (0-100%) culture filtrate (CF) which was obtained from the wilt pathogen *Fusarium oxysporum* f.sp.*niveum*. The selection protocol had two directions: the first was a step-by-step selection from lower to higher selective CF concentrations and the second was exchangeable continuous cycles with and without CF using the same selective CF concentration until the end of the selection regime. The plantlet regeneration occurred under CF stress. The progenies of *in vitro* regenerated plants showed resistance when exposed to the pathogen infections. The results were clear in that the resistance in cucumber to wilt pathogen was segregated as 1 resistant: 2 moderately resistant: 1 susceptible meaning that it is controlled by one pair of genes. *In vitro* selective regimes via tissue cultures are advisable for the selection of novel disease resistant plants because of its time-saving, space, money and bio-safety approach. [A. A. El-Kazzaz and Nehal S. El-Mougy (Egypt), Archives of Phytopathology and Plant Protection, 42(4): 384-391, 2009].

Ecological and Biological Studies on the Red palm Weevil *Rhynchophorus ferrugineus* (Olivier). The field behavior and bionomics of the red palm weevil (RPW) *Rhynchophorus ferrugineus* (Olivier) have been demonstrated. The microclimatic temperature conditions where the insects live were recorded monthly (August-February). The insect lives in a microhabitat with temperatures much lower compared to the outer sunny atmosphere during summer. During winter, the minimum microclimatic temperature during daytime was 12°C compared with 16.1°C in the outer atmosphere. Records in the microclimate of infected trees were always higher compared to those of healthy ones, with a difference of 1-2°C. A high significant difference was observed with respect to infestation levels among different cultivars of date palm. The biology and life history of the weevil have been investigated on five diets, namely banana, sugarcane, squash fruit, apple and palm crown. The weevil was maintained on these diets, but the rate of development showed great variation. The duration of generation was the

shortest on palm crown, followed by banana and then squashes fruit and apple, but it was longer on sugarcane. Egg production was the highest on palm crown being 338 ± 37.24 eggs/female followed by banana, squash fruit, and apple, but the lowest production (117 ± 18.9 eggs/female) was obtained on sugarcane. The fertility ranged between 52 and 83% in those eggs deposited by females previously reared on different diets. [H. S. Salama, F.N. Zaki and A. S. Abdel-Razek (Egypt), Archives of Phytopathology and Plant Protection, 42(4): 392-399, 2009].

Oil Cakes Soil Amendment Effects on *Meloidogyne incognita*, Root-knot Nematode Infecting Tomato. In a pot experiment, oil cakes of cotton, flax, olive, sesame and soybean were mixed with soil at the rate of 5, 10, 15, 20 or 50 g/kg soil. We compared their nematicidal potential with carbofuran as a standard against the root-knot nematode, *Meloidogyne incognita* infecting tomato. Their effects on the growth parameters of tomato plants were also investigated. The results showed that *M. incognita* populations in the soil and root galling were significantly suppressed when the tested cakes, at all rates, were allowed to decompose in the soil. All oil cakes exhibited varying degrees of reduction compared to the control. The highest reduction in galls was noted in plants treated with sesame cake, whereas the lowest reduction was observed in plants treated with olive cake. On the other hand, the highest reduction in J_2 was noticeable in the plants grown in olive-cake-amended soil followed by sesame, soybean, cotton and flax cake. In addition, employing a high rate of the tested cakes gave higher activity in suppressing the nematode both in the soil and in tomato roots than using low rate. The data also indicated that all cakes, at low rates, significantly increased growth indices of tomato over control treatment, except cotton cake which decreased it, particularly in the root system. Phytotoxicity was associated with the higher rates of oil cakes tested except sesame cake. These oil cake soil amendments could prove to be one component in integrated root-knot nematode management for tomato in conventional and organic production systems. [M.A. Radwan, E.K. El-Maadawy, S.I. Kassem, M.M. Abu-Elamayem (Egypt), Archives of Phytopathology and Plant Protection, 42(1): 58-64, 2009].

Differential Interactions Among Cotton Genotypes and Isolates of *Fusarium oxysporum* f. sp. *vasinfectum*. The pathogenicity of nine isolates of *Fusarium oxysporum* f. sp. *vasinfectum* (Fov) was evaluated on seedlings of 30 cotton (*Gossypium barbadense* L.) genotypes in 2005 and 2006. Isolate genotype interaction was a highly significant ($P < 0.01$) source of variation in wilt incidence, suggesting that physiologic specialization exists within Fov isolates. Cluster analysis of aggressiveness of isolates and susceptibility of genotypes by the unweighted pair-group method based on arithmetic means (UPGMA) placed the isolates and the genotypes in several groups. Isolates were separated into two distinct groups. One group was closely related to race 5 while the other group was closely related to race 1. Cluster analysis also demonstrated that the Egyptian commercial cultivars had unique susceptibility patterns to Fov isolates remotely related to those of the other genotypes. The interaction between experiments of 2005 and 2006 was mainly due to a differential effect of years on the disease incidence for cotton cultivars. [Kamel A. Abd-Elsalam, Moawad R. Omar, Abdel-Mongy Asran-Amal and Aly Abdel-Hady Aly (Egypt), Archives of Phytopathology and Plant Protection, 42(5): 464-473, 2009].

JORDAN

Salt Suppression of *Meloidogyne javanica* on Tomato. The influence of ammonium chloride, potassium nitrate and sodium chloride, and inoculation with the root-knot nematode *Meloidogyne javanica*, were evaluated at two levels of electrical conductivity (EC, 4 and 8) in two tomato cultivars (GS12, root-knot susceptible, and Asala, root-knot resistant). Ammonium chloride was more effective than potassium nitrate at both ECs in causing mortality of second-stage juveniles and reducing nematode reproduction (eggs/g fresh root) and root galling. Sodium chloride and potassium nitrate caused significantly greater reductions of shoot and root fresh weights of tomato than ammonium chloride. Thus, ammonium chloride could perhaps be used as an effective and environmentally acceptable control option for *M. javanica* on tomato. [M.R. Karajehl and EM. AJ-Nasir (Jordan). Nematologia Mediterranean, 36:185-190, 2008].

OMAN

A Study to Compare the Adaptation of Two Strains of the Nematode Trapping Fungi, *Monacrosporium salinum*, to Variable Abiotic Factors. The strain of *Monacrosporium salinum* MSO03, isolated from Oman in 2003, has been compared with the patented strain MST84 of the same species isolated in 1984 from Tunisia. *Monacrosporium salinum* MSO03 strain is characterized by an optimal mycelium growth at 30°C compared to the optimal mycelium growth at 20-25°C of the MST84 strains. No germination of *M. salinum* conidia occurred at 40°C, but the MSO03 strain was able to grow at higher temperature (35°C). In addition, MSO03 strain grew at alkaline pHs but not at acid pH lower than 5, while the patented MST84 strains showed optimal growth at pHs lower than 7. Soil pH did not affect the trapping activity of both MSO03 and MST84 strains. However, MST84 strain was more active than MSO03 strain at higher soil salinity (>5 g/l NaCl). Therefore, the MSO03 strain can resist to the severe stress conditions, such as drought and extreme temperature, occurring in Omani agro-ecosystems. [S. Kallel, S. Elfekih, A. Abdelwahed and M.M. B'Chir. (Sultanate Oman & Tunisia). Nematologia Mediterranean, 36:191-195, 2008].

SYRIA

Molecular Characterization of a *Bean yellow mosaic virus* Isolate from Syria. *Bean yellow mosaic virus* (BYMV, genus *Potyvirus*, family *Potyviridae)* was studied by comparing sequences from the coat protein (CP) gene of a Syrian isolate with sequences of six other isolates from the NCBI database. A homology tree of the CP sequences was developed using DNAMAN Software. BYMV isolates were grouped into two clusters of which the first comprised the Syrian isolate together with the Indian, Australian and Japanese isolates, and the second the BYMV isolates from China, the Netherlands and the USA. Moreover, the homology tree showed that the Syrian isolate was very close to the Indian one, with 99% homology. [M. Al-Khalaf, S. kumari, A. Haj Kasem, K.M. Makkouk, A. Shalaby and S. Al-Chaabi. (Syria). Phytopathologia Mediterranean, 47:282-285, 2008].

Seed-borne Pathogens Detected in Consignments of Cereal Seeds Received by the International Center for Agricultural Research in the Dry Areas (ICARDA), Syria. During 1995-2004, the Seed Health Laboratory at the International Center for Agricultural Research in the Dry Areas (ICARDA), Aleppo, Syria, tested all incoming cereal seed from 41 countries (251 seed lots comprising 91,993 samples) for the presence of seed-borne pathogens. Pest detection methods used included direct visual inspection, wash-filter, freezing-blotter, embryo, seed-gall nematode and growing-on tests. Analysis of seed lots with ≥30 seeds (53,566 seeds in total) revealed that 22.03% (11,797) of the seeds, predominantly of barley and wheat, were infected. Of these, 20.02% were infected with *Tilletia caries* and/or *T. foetida*, followed by *T. controversa* (0.99%), *Ustilago tritici* (0.30%), *T. indica* (0.27%), *Fusarium* spp. (0.25%), *Helminthosporium* spp. (0.09%), *Ustilago* spp. (0.03%), *Urocystis agropyri* (0.02%), *Anguina tritici* (0.02%) and *Ustilago hordei* (0.01%). The frequency of *Tilletia indica*-infection in seed samples was: Ethiopia 13.31%, Azerbaijan 10.20%, Tajikistan 0.64%, and Turkey 0.22%. *T. indica* and *T. controversa* do not occur in Syria and are considered as quarantine pests with zero tolerance. The implications of these findings for the safe movement of cereal germplasm are discussed. [Siham Asaad and Mathew M. Abang (Syria). International Journal of Pest Management, 55(1): 69-77, 2009].

Osmotic Potential Effects on in *vitro* Growth, Morphology and Pathogenicity of *Cochliobolus sativus*. Common root rot caused by *Cochliobolus sativus*, is an economically important disease found worldwide. In in vitro studies, the influence of salt on the growth and pathogenicity of C. sativus was investigated using potato dextrose agar adjusted to different osmotic potentials with NaCl and KCl. Mycelial growth rates, colony diameter and germination decreased as salt concentrations increased, and NaCl caused greater negative effects than KCl. The high solute concentrations of NaCl and KCl (200–500 mM) reduced the synthesis of mycelial pigments and the size of conidia, while the production of spores was inhibited at 500 mM NaCl. Pathogenicity of *C. sativus* was also significantly reduced in salt treatments compared with the untreated control and this reduction was greater in NaCl than in KCl. The tolerance of the common root rot pathogen to high salt concentrations provides important information about the survival of the fungus in saline areas. [M.I.E. Arabi and M. Jawhar, (Syria). Australasian Plant Pathology, 38(3) 310–313, 2009].

TUNISIA

Effect of Common Cultural Practices on Septoria Leaf Blotch Disease and Grain Yield of Irrigated Durum W heat. Using alternative cultural practices could be an attractive option to reduce fungicide without impairing Septoria leaf blotch disease (caused by *Mycosphaerella graminicola*, anamorph: *Septoria tritici*) control in irrigated durum wheat fields. Association between common cultural practices and disease related traits were assessed from data collected on a sample of 48 durum wheat fields. Results suggested that relying exclusively on one component rather than integrating a combination of practices is not cost effective to alleviate Septoria leaf blotch disease impact on grain yield. Disease severity increase was attributed to the extensive use of a susceptible cultivar "Karim", early sowing, higher seeding rate, on farm produced seeds, greater nitrogen rates, and an ineffective fungicide application explaining 81.7% of the total variability of the surveyed durum wheat fields. Fungicide application reduced Septoria leaf blotch disease infection and its spread in treated fields but did not prevent infection. Fungicide application effect was lower for both low (less than 10%) and high (greater than 60%) severity, but it was effective when severity ranged from 40% and 50%. Lower critical Septoria leaf blotch disease threshold ranging between 10 to 20 % appeared to be adequate in reducing Septoria leaf blotch disease impact on grain yield. The study shows that lack of disease damage assessment is the most important component of farmers' decision-making process with regard to the treatment dates and number of fungicide applications. Implementing a suitable integrated Septoria leaf blotch disease management program in irrigated durum wheat areas should be sought by varying cultural practices options. [S. Rezgui, M.M.S. Fakhfakh, A. Boukef, MP. Rhaiem, Ma. Chérif and A.H. Yahyaoui (Tunisia & Syria). Tunisian Journal of Plant Protection, 3(2): 59-67, 2008].

Chemical and Biological Control of *Phomopsis amygdali* the Causal Agent of Constriction Canker of Almond in Tunisia. Almond trees (*Prunus dulcis*) growing in the Tunisian aeries were attacked by *Phomopsis amygdale* which causes constriction canker, a damaging and economically important fungal disease. The aim of this study, carried out in laboratory and in the field, was to test some fungicides and *Trichoderma* spp. antagonists. antagonists. Chemical experiments showed that benomyl, methyl-thiophanate and carbendazim were effective in completely inhibiting the mycelial growth and the germination of conidia. Field experiments revealed that

except for procymidone, all tested fungicides significantly reduced disease compared to untreated control. Benomyl, methyl-thiophanate and carbendazim provided the best control and gave a more than 70% reduction in infected shoots. Biological experiments showed that the antagonists *Trichoderma viride* and *Trichoderma harzianum* reduced significantly the mycelial growth of *P. amygdali*. Field experiments revealed the occurrence of more than 50% reduction in infected buds as compared to the untreated control. [A., Rhouma, M.A., Triki, K.Ouerteni and M.Mezghanni. (Tunisia). Tunisian Journal of Plant Protection. 3(2):69-77, 2008].

Insecticidal Activity of Flower and Leaf Extracts from *Chrysanthemum* Species Against *Tribolium confusum*. The present work describes the insecticidal activity of flower and leaf methanolic extracts of eight *Chrysanthemum* species on the confused flour beetle *Tribolium confusum*. Insect responses varied according to plant species. High rate mortality was recoded after 3 weeks ingestion of the insect with extracts from *C. coronarium, C. macrotum, C. myconis, C. fuscatum, C. paludosum, C. trifurcatum,* and *C. grandiflorum,* but with *C. segetum* extracts, toxicity level was low. Extracts topically applied on *T. confusum* revealed after 96 h high toxicity caused by *C. fuscatum* and *C. grandiflorum* flower extracts. These results suggest the presence of actives toxic substances acting after consumption or topical application. [D., Haouas, M., Ben Halima-Kamel and M.H. Ben Hamouda. (Tunisia). Tunisian Journal of Plant Protection, 3(2):87-93, 2008.].

Biology of *Stethorus punctillum*, a Potential Predator of *Tetranychus ludeni*. *Stethorus* spp. are among natural enemies of spider mites so far identified in the world. In this study, biology and feeding ability of *Stethorus punctillum* were studied as predator of the spider mite *Tetranychus ludeni*, under laboratory conditions (27°C, 65% RH). The predator completed its developmental stages (egg, four instars larvae, and pupae) within an average of 17.35 + 7.12 days (15-29 days). The 4 instars larvae took only 44.55% of the total developmental time. Mean life history of the predatory completed in 37 + 12.5 days with an average ovipositional period of 15.32 + 10.25 days. The daily and total fecundity recorded are 7.8 + 3.3 and 121 + 22.5 eggs, respectively. Concerning the consumption of the prey, 6.19 active mite stages were needed by the predator to lay down an egg. The abilities of predation of the four larval instars constituted 16.47% of prey consumption and the mean daily prey consumption during the predatory life span was recorded as 26.45 of active spider mites. [M.Arbabi and J.Singh. (Iran & India). Tunisian Journal of Plant Protection, 3(2):95-100, 2008].

Seed Germination and Tubercle Development of *Orobanche foetida* and *Orobanche crenata* in Presence of Different Plant Species. In Tunisia, some crops are severally attacked by two orobanche species (*Orobanche foetida* and *Orobanche crenata*), causing in some areas important yield losses. Bioassays were carried out to determine if broomrape seeds are able to germinate in the presence of root exudates of different crops in the same way as in the presence of their specific hosts. Twenty crop species were tested *in vitro* to determine their effects on the germination and development of broomrape seeds. Results of the Petri dish study were validated in a pot experiment. In the Petri dish assay, *O. foetida* seeds germinated and tubercles developed in the presence of vetch, alfalfa, lentil, chickpea and faba bean. Seeds of this parasite germinated without tubercle development when grown in the presence of fenugreek, flax, safflower, bread wheat, bean and pea. On the other hand, seeds of *O. crenata* germinated and tubercles developed on safflower, peanut, vetch, lentil, chickpea, pea and faba bean and germinated without tubercle development on fenugreek, flax, tomato, sunflower, maize, oat, bread and durum wheat, alfalfa and bean. These results suggest that in fields infested with *O. foetida*, the use of bean, pea, flax and fenugreek in the crop rotation may reduce the orobanche seed bank. Whereas in fields infested with *O. crenata*, crops such as bean, flax, alfalfa, wheat and oat used in the crop rotation may reduce the soil seed bank of this broomrape. [Z., Abbes, M., Kharrat and W.Chaibi. (Tunisia). Tunisian Journal of Plant Protection, 3(2):101-109, 2008].

Transformation of Energy Reserves in the Trophic Sites Induced by *Meloidogyne javanica* in Potato Tubers. Root knot nematodes *Meloidogyne* spp. are sedentary endoparasites. On tubers of potato they induce the formation of specific feeding sites essential for their development. Structure and cytoplasm content of nurse cells seem to be deeply modified. A specific coloration by the Lugol test shows that they are not as rich in starch as the adjacent unchallenged cells. This observation is confirmed by measurement of the concentration of starch per g of dry matter of infested tissue. The total sugar concentration was inversely proportional to that of starch in the feeding sites. Sugars in the nurse cells seem not to be extra cell products but the result of nematode trophic activity on the starch stored in these cells. [W. Hlaoua and N. Horrigue-Raouan. (Tunisia). Nematologia Mediterranean, 36:211-216, 2008].

TURKEY

Evaluation of Cotton Cultivars for Resistance to Pathotypes of *Verticillium dahliae*. After the recent detection of serious losses caused by Verticillium wilt of cotton, incited by the defoliating pathotype of *Verticillium dahliae* in the Aegean Region of Turkey, 28 of the most commonly grown cotton cultivars (*Gossypium hirsutum* L.) of Turkey, were evaluated for the presence of field resistance to wilt. Six-week-old plants were inoculated with a cotton non defoliating (ND) or cotton defoliating (D) pathotype of *V. dahliae* under controlled conditions. Resistance was evaluated on the basis of external symptoms by calculating areas under disease progress curves. The percentage of plants killed and of those which recovered from the disease was used as additional parameters for including a particular cultivar into a defined category. Most of the evaluated cultivars were susceptible, although at different levels, to both pathotypes of *V. dahliae*. All

cultivars were more susceptible to the D than to the ND pathotype. The most promising cultivars in the experiments appeared to be Carmen and ST-373. Carmen showed differential resistance: it was susceptible to the D but resistant to the ND pathotype. ST-373 was moderately susceptible to both pathotypes of *V. dahliae*. A resistance related phenotypic reaction to the disease was quantified by using six growth parameters (plant height, number of nodes, leaf weight, stem weight, leaf to stem ratio, and total shoot weight) measured 13 d after inoculation. The percentage decrease in leaf–stem ratio and leaf weight were found to be the best indicators of resistance. Results obtained in this study will be useful to quantify resistance to *V. dahliae* and identify the best parameters to phenotype in genetic studies. [M. Erhan Göre, Öncül K. Caner, Nedim Altın, M. Hadi Aydın, Oktay Erdoğan, Funda Filizer and Arzu Büyükdöğerlioğlu (Turkey), Crop Protection, 28(3): 215-219, 2009]

❖ SOME PLANT PROTECTION ACTIVITIES OF FAO AND OTHER ORGANIZATIONS

DESERT LOCUST SITUATION

General Situation during October 2009 Forecast until mid-December 2009

An outbreak of Desert Locust developed in early October in western Mauritania. Control operations were in progress against a second generation of hatchlings and hoppers that were forming small concentrated groups and a few bands. The outbreak should be contained by early December unless unusually heavy and widespread rains fall in November. In that case, small swarms could form in early December and move north into southern Morocco, Western Sahara and northern Mauritania and breed, causing a significant increase in locust numbers that could lead to a regional upsurge. Elsewhere, the situation remained calm and vegetation was drying out in most areas. Only isolated adults were seen in parts of the northern Sahel in West Africa and on the Red Sea coast in Yemen. During the forecast period, low numbers of locusts may persist in a few parts of the northern Mali and Niger, and in northeast Chad. Small-scale breeding is likely to occur along both sides of the Red Sea.

Western Region - A potentially dangerous outbreak developed in western Mauritania in late September and early October. Additional national teams were deployed to conduct survey and control operations, treated nearly 4,000 ha. The outbreak is smaller than in 2003 and Mauritania is better prepared with sufficient resources to combat new hopper groups as they form during November. Very little rain fell in the Region during October, which means that breeding is likely to end shortly unless more rains fall. This, combined with effective control operations against primarily hopper infestations, should reduce locust numbers and bring the situation under control and stop the migration of adults towards the north. So far, only isolated solitarious immature adults have arrived in adjacent areas of southern Morocco and Western Sahara. Elsewhere, low numbers of adults were present in central Mali, southern Algeria, northern Niger and Chad. Small-scale breeding may have occurred in some of these places during October.

Central Region - Very little rain fell during October in the Region except for light showers on the Red Sea coast of Yemen where low numbers of locusts were present. Consequently, small-scale breeding is likely to occur during the forecast period, causing locust numbers to increase slightly. Elsewhere, a ground team treated solitarious hoppers and adults at one place in the northern highlands of Ethiopia, and isolated adults were seen on the northern Red Sea coastal plains in Eritrea. During the forecast period, low numbers of adults are likely to appear on the Red Sea coast of Sudan, Eritrea and Saudi Arabia, and breed on a small scale in any areas that receive rainfall. No significant developments are likely.

Eastern Region - No significant rain fell during October and no locusts were reported in the Region. The situation will remain calm during the forecast period.

❖ SHORT PLANT PROTECTION NOTES

- Aflatoxin production in fungal strains is correlated with glutathione S-transferase expression and can be used to differentiate aflatoxin-producing fungi from nontoxic counterparts report T. Ziglari and associates at Tarbiat Modares University, Pasteur Institute, and University of Tehran, Iran. (Mycopathologia, 166:219-226, 2008)

- Bacterial wilt and Fusarium wilt were managed by using susceptible heirloom tomato scions grafted onto resistant rootstocks and planted in naturally infested soil report C. L. Rivard and F. J. Louws at North Carolina State University. (HortScience, 43:2104-2111, 2008)

- Bumble bees transmit *Pepino mosaic virus* in tomato greenhouses, first in flowers, then fruit, then other plant parts report J. L. Shipp and associates at Agriculture and Agri-Foods Canada at Harrow and Vineland, Ontario, and the Ontario Ministry of Agriculture. (Annals of Applied Biology. 153:149-155, 2008)

- *Erwinia carotovora* subsp. *carotovora* causes canker in young plants of different poplar species reports A. Fabi at the University of Tuscia, Italy. (Forest Pathology, 38:356-370, 2008

- Fungus gnats and moth flies can be aboveground vectors of soil-borne pathogens *Fusarium acuminatum*, *Thielaviopsis basicola*, and *Verticillium dahliae*, reports Z. A. El-Hamalawi at the University of California, Riverside. (Annals of Applied Biology, 153:195-203, 2008)

- Monoclonal antibodies specific to the strobilurin fungicide pyraclostrobin were synthesized and assayed for by J. V. Mercader and associates at CSIC and Universitat de Valéncia, Spain. (Journal of Agriculture and Food Chemistry, 56:7682-7690, 2008)

- Myclobutanil applied to soybean plants is mobile in xylem to control Asian rust report G. Kemmitt and associates at Dow AgroSciences located in Brazil, UK, and USA. (Pest Management Science, 64:1285-1293, 2008)

- Outcrossing between carbendazim-sensitive and –resistant isolates of *Fusarium graminearum* and sexual recombination lead to carbendazim resistance in the field report Y. Chen and M.-G. Zhou at Nanjing Agricultural University, China. (Pest Management Science. 65:398-403, 2009)

- *Phoma koolunga* is a new species causing lesions on field pea similar to ascochyta blight report J. A. Davidson and associates at University of Adelaide, CSIRO (ACT), Orange Agricultural Institute (NSW), and South Australia Research and Development Institute, Australia. (Mycologia Journal101:120-128, 2009)

- *Puccinia graminis* f. sp. *tritici* race UVPgt55, similar to race Ug99, was probably introduced into South Africa, based on Simple Sequence Repeat and AFLP marker analyses, report B. Visser and associates at University of the Free State, South Africa. (Molecular Plant Pathology 10:213-222, 2009)

- The greater the concentration of *Rhodotorula glutinis* applied, the better the control of gray and blue mold of stored apples and the better fruit quality report H. Zhang and associates at Jiangsu University, Ludong University, and Zhejiang University, China. (Biological Control, 48:79-83, 2009)

- The vector for stolbur phytoplasma on grape is the planthopper *Reptalus quinquecostatusis* report F. Pinzauti and associates at CRA, Florence, Italy. (Annals of Applied Biology, 153:299-305, 2008)

- Using integrated crop management to control Botrytis gray mold of chickpea, yields were 15 to 50% greater than using normal farmer practices in Bangledesh report C. Johansen and associates at the University of Western Australia, Bangledesh Agricultural Research Institute, Department of Agriculture and Food Western Australia, and ICRISAT, India. (Field Crops Research, 108:238-249, 2008)

- *Wheat streak mosaic virus* is seedborne, and size-selection is not effective in eliminating infected seed from a seed lot report V. M. Lanoiselet and associates at West Australia Department of Agriculture and Food, NSW Department of Primary Industries, and Charles Stuart University, Australia. (Australian Plant Pathology, 37:584-588, 2008)

- When three winter barley cultivars are mixed in equal proportions in different ways and sowed in field plots for three successive years, most mixtures significantly reduced disease in all years, compared to cultivars grown in monoculture, report A. C. Newton and D. C. Guy at SCRI, Scotland. (Field Crops Research. 110:225-228, 2009)

❖ GENERAL NEWS

HERBICIDE-TOLERANT CROPS WITHOUT THE FOREIGN GENES

Using a tailor-made enzyme, scientists at the University of Minnesota and Massachusetts General Hospital developed an herbicide-tolerant tobacco plant without significant changes to its DNA. "It's still a GMO but the modification was subtle," says Daniel Voytas lead author of the paper published online by *Nature.* "We made a slight change in the sequence of the plant's own DNA rather than adding foreign DNA." The new approach has the potential to develop improved crop varieties while minimizing concerns about genetically modified organisms. Voytas and colleagues used a zinc finger nuclease (ZFN) to target tobacco acetolactate synthase (*ALS*) genes. Mutations in the ALS genes have been shown to confer resistance to imidazolinone and sulphonylurea herbicides. The scientists observed high frequency of gene targeting, with more than 40 percent of the recombinant plants having modifications in the *ALS* gene. ZFNs are synthetic proteins that bind to specific DNA sequences and introduce modifications at or near the binding site by inducing double strand breaks. ZFNs have been used to manipulate the genomes of several organisms, from tobacco to zebrafish and even mammalian cells. For more information, read http://www1.umn.edu/news/news-releases/2009/UR_CONTENT_107428.html The paper published by *Nature* is available at:
http://dx.doi.org/10.1038/nature07845
http://www.springerlink.com/content/f5l108080521538u/?p=68ae960c58b34f529651fcec82a34b1c&pi=0" \o "http://www.springerlink.com/content/f5l108080521538u/?p=68ae960c58b34f529651fcec82a34b1c&pi=0

REBUTTAL RE ERRONEOUS ANALYSIS ON TRANSGENIC INSECTICIDAL CROPS

An article by Lövei et al. (Transgenic insecticidal crops and natural enemies: a detailed review of laboratory studies, Environmental Entomology 38(2): 293-306 (2009)) purports that insect-protected crops based on the Cry proteins of *Bacillus thuringiensis* may have substantial negative impacts on non-target organisms. A group of experts in this area strongly disagreed with this April, 2009 publication and felt that a rapid response was required but, because of production schedules of this bi-monthly journal, it could not accommodate a rapid rebuttal. Thus, A. M. Shelton and 14 colleagues published their Letter to the Editor in Transgenic Research (Setting the Record Straight: A Rebuttal to an Erroneous Analysis on Transgenic Insecticidal Crops and Natural Enemies). Among the many concerns Shelton and colleagues describe in their rebuttal are the inappropriate and unsound methods for risk assessment that led Lövei et al. to reach conclusions that are in conflict with those of several comprehensive reviews and meta-analyses. Shelton summarized the concerns of the 15 authors by stating, "The Lövei et al. article advocates inappropriate summarization and statistical methods, a negatively biased and incorrect interpretation of the published data on non-target effects, and fails to place any putative effect into a meaningful ecological context." What was also troubling to this international group of 15 experts is the potential for the Lövei et al. article to be accepted at face value and impact some regulatory agencies. Their rebuttal can be accessed using the following link:
http://www.springerlink.com/content/q7hk642137241733/.
The article is open access and freely available to all and is published as DOI: 10.1007/s11248-009-9260-5. It will be published in print form in the June issue of Transgenic Research.

OVERRELIANCE ON ROUNDUP MAY GIVE RISE TO HERBICIDE-TOLERANT WEEDS, SAYS PURDUE STUDY

Overreliance on Roundup Ready crops may be weakening glyphosate's ability to control weeds, according to researchers from Purdue University. Bill Johnson, a professor of weed science and lead author of the paper, warned that it would just be a matter of time before there are so many resistant weeds that the use of glyphosate products would become much less effective. "We have weeds that have developed resistance, including giant ragweed, which is one of the weeds that drove the adoption of Roundup," Johnson said. Johnson and colleagues surveyed farmers in Indiana, Illinois, Iowa, Mississippi, Nebraska and North Carolina about their views on the ability of Roundup Ready crops to help control problematic weeds. Their paper appears in the current issue of *Weed Technology Journal*. The survey shows that farmers who saw the most benefit from using Roundup rotated between types of crops and those that were Roundup Ready and conventional crop varieties. Crop rotation has been shown to be effective in slowing the development of glyphosate-resistant weeds. Johnson said farmers should treat Roundup and Roundup Ready crops as an investment and work to protect the technology. The survey was funded by Monsanto, developer of Roundup Ready crops. For the complete article, read:
http://news.uns.purdue.edu/x/2009a/090414JohnsonSurvey.html The paper published by *Weed Technology Journal* is available at http://dx.doi.org/10.1614/WT-08-038.1.

SCIENTISTS DEVELOP SOFT-ROT RESISTANT POTATOES

By introducing a synthetic gene that codes for maiginin 2, researchers at the New Zealand Institute for Plant & Food Research Ltd developed potato plants resistant to *Erwinia carotovora*. The soil dwelling microbe causes the dreaded soft rot disease in potatoes, carrots, and other vegetables, and infections often result in a complete crop loss. The soft-rot resistant potato plants that the New Zealand scientists developed express a synthetic maiginin 2 gene. First identified in frog skin, maiginin peptides are selectively toxic to microbes and not mammalian cells. Several studies have also shown that the peptide has a broad activity against numerous phytopathogens, including some fungi and the bacterial agents that cause common scab and blackleg. In engineering the maiginin gene, the researchers made several mutations to reduce the peptide's susceptibility to proteolytic cleavage and increase its activity against prokaryotes. The transgenic potato lines were tested for three planting seasons. The soft-rot resistant potatoes were found to be similar to conventional potato varieties in terms of yield and other agronomic performance criteria. The article published by the *Open Plant Science Journal* is available for free at http://dx.doi.org/10.2174/1874294700903010014

SCIENTISTS DEVELOP ROOT NEMATODE RESISTANT POTATO

The United States Department of Agriculture's Agriculture Research Service (ARS) has developed a new potato line resistant to the Columbia root-knot nematode (CRN), a microscopic worm that has the potential to cause the US potato industry some USD 40 million annually. The nematodes, which thrive in the Pacific Northwest and other major potato growing regions in the US, are usually controlled by applying chemical fumigants. Control of CRN using chemicals is effective, but very expensive. It is estimated that US potato growers spend USD 20 million annually to control the pest. The CRN resistance trait was obtained from a wild potato relative, *Solanum bulbocastanum*. But since wild and domesticated potatoes are chromosomally incompatible, that is they can't breed to

produce viable offspring, the scientists resorted to protoplast fusion. The researchers fused *S. bulbocastanum* and domesticated potato cells together and backcrossing was used to remove unwanted traits. Marker genes linked to the *RMc1* resistance gene from wild potato were used to determine resistance levels in resulting hybrids. The new variety will still undergo field-testing for two years before it can be commercialized. Read the complete news article at http://www.ars.usda.gov/is/pr/2009/090417.htm

❖ PUBLICATIONS

NEW BOOKS

- **Dictionary of the Fungi (Tenth Edition).** Edited by P.M. Kirk, P.F. Cannon, D.W. Minter and J.A. Stalpers. This new edition, with more than 21,000 entries, provides the most complete listing available of generic names of fungi, their families and orders, their attributes and descriptive terms. For each genus, the authority, the date of publication, status, systematic position, number of accepted species, distribution, and key references are given. Diagnoses of families and details of orders and higher categories are included for all groups of fungi. In addition, there are biographic notes, information on well-known metabolites and mycotoxins, and concise accounts of almost all pure and applied aspects of the subject (including citations of important literature). All information has been updated as necessary since the publication of the ninth edition in 200l. In addition the tenth edition has the following new features. A completely new classification of the Kingdom Fungi based on recent multi-gene phylogenetics research. A major revision of the classification of the Basidiomycota and substantial modification of the basal groups. Further integration of anamorphic and teleomorphic genera in the classification. Enhanced distinctions between the true fungi and unrelated groups traditionally studied by mycologists. Improved information on references to publications.
- **New APS PRESS Virus Diseases of Plants Image Database and Teaching Resource American Phytopathological Society. www.apsnet.org**
  St. Paul, Minnesota (March 5, 2009)-VIRUS DISEASES OF PLANTS 2-CD set provides an international collection of color images of virus symptoms and other associated images that emphasize identification and provide information on epidemiology, losses, and control. The 2-CD set presents information on field identification not available from other sources and most of the information on plant resistance is not easily available as well, especially across several viruses affecting a single plant. VIRUS DISEASES OF PLANTS is a unique compilation that will be invaluable to educators, scientists, students, growers, and other agribusiness personnel.

  VIRUS DISEASES OF PLANTS: Image Database Collection CD contains 1,218 images of symptoms, vectors, viruses, viroids, and disease symptoms that might be confused with those caused by viruses across a broad range of more than 120 host plants. Each image contains information about the current scientific classification of the virus disease shown based on the 8th Report of the International Committee on Taxonomy of Viruses. Scientists currently working on the crop viruses have written the captions for the images and assisted in editing the compilation.

  VIRUS DISEASES OF PLANTS: Grapevine, Potato, and Wheat Image Collection and Teaching Resource CD contains an image collection of virus diseases of grapevine, potato, and wheat, plus teaching resources on these crops. More than 430 images are integrated with information about the disease symptoms, epidemiology, causal virus(es), diagnosis, and management. An audiovisual component contains narration synchronized with slide shows of selected images. This feature, about 40 minutes long, is designed for classroom presentations or for individual study.

  The images on both *VIRUS DISEASES OF PLANTS CDs* are searchable by virus, virus genus or family, plant, symptom, vector, or other words in the captions. The caption for each image contains the symptom description, disease name, virus name, host plant, and image contributor. These CDs contain a program that gives you the ability to create a custom slide show and export it. You may also export the images for use in custom PowerPoint™ presentations.

  VIRUS DISEASES OF PLANTS 2-CD set may be purchased for $259 for the personal use license or $495 for the multiple user license plus S&H (USD) from The American Phytopathological Society. To order this 2-CD set go to the APS PRESS online store at www.shopapspress.org or call toll-free 1.800.328.7560 U.S.A. and most of Canada or +1.651.454.7250 elsewhere.
  Contact: Ashley Armstrong, The American Phytopathological Society, Tel:+1-651-454-7250, e-mail: apspress@scisoc.o

❖ SELECTED RESEARCH PAPERS

Assessment of genetic variability and genotyping of *Ceratitis capitata* and *Bactrosera zonata* by molecular techniques. 2009. M. M. Zahran, O.O. El-Fandary, Y.A. Mahmoud (Egypt), Archives of Phytopathology and Plant Protection, 42(1): 2–9.

Seed-borne pathogens detected in consignments of cereal seeds received by the International Center for Agricultural Research in the Dry Areas (ICARDA), Syria. 2009. Siham Asaad and Mathew M. Abang (Syria), International Journal of Pest Management, 55(1): 69-77.

Biotoxic effects of Sumisclex and Carbomar fungicides on four *Aspergillus* species isolated from the rhizosphere of some Taif plants. 2009. Alaa M. Abou-Zeid and Abdalla D. Altalhi (Saudi Arabia), Archives of Phytopathology and Plant Protection, 42(5): 474-480.

Genotypic characterization of *Bacillus subtilis* strains colonizing pomegranate phyllosphere and their antagonistic activities against *Cercospora beticola*. 2009. Abdullah Altalhi (Saudi Arabia), Archives of Phytopathology and Plant Protection, 42(6): 524-532.

Determination of the resistance status of experimental soybeans to the lima bean pod borer, *Etiella zinckenella* Treitschke and the Whitefly, *Bemisia tabaci* Gennadius at El-Dakhla Oases, New Valley, Egypt. 2009. Mohamed A. Amro, A.S.H. Abdel-Moniem and Mahmoud S. Omar (Egypt), Archives of Phytopathology and Plant Protection, 42(6): 552-558.

Molecular characterization of European and Egyptian isolates of *Sclerotium cepivorum*, the incitant of onion white rot. 2009. N.M. Sallam, A.A. Abd Elrazik, M. H. A. Hassan and E. Kock (Egypt), Archives of Phytopathology and Plant Protection, 42(6): 566-572.

Antibacterial activity of certain plant extracts against bacterial wilt of tomato. Five isolates of *Ralstonia solanacearum* were isolated from a naturally wilted root of tomato plants grown in Assiut governorate. 2009. K.A.M. Abo-Elyousr and M.R. Asran (Egypt), Archives of Phytopathology and Plant Protection, 42(6): 573-578.

Effect of acetic acid fumigation on soil-borne fungi and cucumber root rot disease under greenhouse conditions. 2009. Farid Abd-El-Kareem (Egypt), Archives of Phytopathology and Plant Protection, 42(3): 213-220.

Effect of some materials on *Sesamia cretica* infesting some maize and sorghum varieties. 2009. H.A. Ezzeldin, A.A.A. Sallam, T.Y. Helal and H.A. Fouad (Egypt), Archives of Phytopathology and Plant Protection, 42(3): 277-290.

Powder formulations of *Bacillus subtilis, Trichoderma* spp and *Coniothyrium minitans* for biocontrol of Onion White Rot. 2009. N. Sallam, A.A. Abd Elrazik, M. Hassan and E. Koch (Egypt & Germany), Archives of Phytopathology and Plant Protection, 42(2): 142-147.

Methyl jasmonate stimulates polyamines biosynthesisand resistance against leaf rust in wheat plants. 2009. Wafaa M. Haggag and F. Abd-El-Kareem (Egypt), Archives of Phytopathology and Plant Protection, 42(1): 16-31.

Impact of extracted honeybee queen substance on survival and certain biological parameters of the black cutworm, *Agrotis ipsilon* (Hufn.). 2009. A.A.I. Ahmed, M.A. Gesraha and B. Schricker (Egypt & Germany), Archives of Phytopathology and Plant Protection, 42(1): 39-51.

❖ EVENTS OF INTEREST

2010

*** 23 February - 3 March**

Global Biosecurity 2010, Safeguarding Agriculture and the Environment, at the Brisbane Convention Center, Queensland, Australia. See: www.globalbiosecurity2010.com.

*** 26-30 April**

IFLRC V & ECGL VII, Legumes for Global Health: Legume Crops and Products for Food, Feed and Environmental Benefits. Antalya, Turkey, se web. http://www.iflrc-ecgl.org.

*** 11 June**

12th International Conference on Plant Pathogenic Bacteria, ICPPB. It will be held in Réunion Island, France. The programme of the conference and information about registration are available on our website at http://www.icppb2010.org

*** 20-25 June**

13th Congress of the Mediterranean Pytopathological Union in Rome, Italy. See: www.mpunion.com. Contact: laura.mugnai@unifi.it or mpucongress.2010@entecra.it

*** 4-8 July**

12th IUPAC International Congress of Pesticide Chemistry in Melbourne, Australia. See: http://www.iupacicpc2010.org/

*** 7-11 August**

APS Annual Meeting 2010 at Opryland, Nashville, Tennessee, USA. See: http://www.apsnet.org

*** 1-6 August**

9th International Mycological Congress (IMC9) in Edinburgh, Scotland, UK. See: http://www.imc9.info/

*** August**

Plant Virus Epidemiology Symposium at Cornell University, Ithaca, New York, USA. See: http://www.isppweb.org/ICPVE/

*** 22-27 August**

XXVIII International Horticultural Congress (IHC2010) in Lisbon, Portugal. Contact: info@ihc2010.org. See: http://www.ihc2010.org

*** 25-31 August**

10th International Congress of Plant Pathology 2013 (ICPP2013) "Bio-security, Food Safety and Plant Pathology: The Role of Plant Pathology in a Globalized Economy" in Beijing, China. Watch: http://www.isppweb.org/congress.asp

*** 31 August - 3 September**

The 8th International Conference on Pseudomonas syringae and Related Pathogens in Oxford, UK. See: www.reading.ac.uk/Psyringae2010. Contact: syringae2010@plants.ox.ac.uk