Arab and Near East Plant Protection Newsletter

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ARAB AND NEAR EAST PLANT PROTECTION NEWSLETTER

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

EDITORIAL

What Are the Questions the Next Generation of Plant Protection Scientists Should Address?

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

This exercise was conducted for plant sciences by a group of internationally distinguished scientists and detailed information related to the outcome of this study can be reviewed at "New Phytologist, 192:6-12". The study came up with 100 most important questions facing plant science research. The following 10 questions are those related to plant protection science:

When and how can we simultaneously deliver increased yields and reduce the environmental impact of agriculture?

What are the best ways to control invasive species including plants, insect pests and pathogens?

Can we provide a solution to intractable plant pest problems in order to meet increasingly stringent pesticide restrictions?

What is the most sustainable way to control weeds?

How can the association of plants and mycorhizal fungi be improved or extended towards better plant and ecosystem health?

How can we use our knowledge of the molecular biology of disease resistance to develop novel approaches to disease control?

What are the mechanisms for systemic acquired resistance to pathogens?

When a plant resists a pathogen, what stops the pathogen growing?

How do pathogens overcome plant disease resistance, and is it inevitable?

Can we use non host resistance to deliver more durable resistance?

The above questions are an eye opener to young graduate students searching for a research thesis title. However, I found that the most challenging general question was this:

How can we attract the best young minds to plant science (including plant protection) so that they can address grand challenges facing humanity such as climate change, food security, and fossil fuel replacement?

Everyone knows that we need medical doctors, and the idea that our best and brightest should go into medicine is embedded in our culture. However, even more important than medical care is the ability to survive from day to day; this requires food, shelter, clothes and energy, all of which depends on plants. Making the best possible progress will require exceptional people. We need to radically change our culture so that "plant doctor" can join "medical doctor", "engineer", "vet", and "lawyer" in the list of top professions to which our most capable young people aspire.

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INVASIVE AND NEW PESTS

ALGERIA

First Report of *Botryosphaeria iberica* Associated with Dieback and Tree Mortality of Monterey Cypress (*Cupressus macrocarpa*) in Algeria. Stem cankers and branches showing bark discoloration, fissuring, resin exudation leading to dieback, crown wilting, and tree mortality have been observed since late spring 2008 on 40-year-old *Cupressus macrocarpa* (Hartw.) trees planted in forests mixed with *Juniperus oxycedrus* L. and *Acer monspessulanum* L. in Taffet, near Ain Abbessa, in the district of Bougaa, Algeria (36°18′57″N; 05°06′33″E; 1,400 m elevation). In 2010, approximately 60% of the *C. macrocarpa* trees were diseased. For fungal isolations, cankered branches were surface sterilized with ethanol. After removal of the outer bark, fragments of necrotic inner bark taken from the margin of cankers were plated on potato dextrose agar (PDA). Most of the colonies were identified as *Botryosphaeria iberica* (Phillips, Luque & Alves) based on comparison of morphological traits and DNA sequences with known isolates of the fungus. *Pestalotiopsis funerea* colonies were also obtained, although with less frequency. *B. iberica* colonies on PDA were dark green with aerial mycelium and optimum growth at 25°C. Pycnidia were produced after 3 weeks of incubation at 20°C under a 12-h near UV light photoperiod on water agar amended with autoclaved cypress seeds. Conidia were brown, one-septate, oval to oblong, and 24.2 (20.1 to 27.4) × 11.2 µm (8.8 to 14.1) (n= 50). An isolate was deposited at the Centralbureau voor Schimmelculture as CBS 130984. DNA was extracted from freeze-dried mycelium and amplified using primers ITS1 and ITS4. The amplified DNA sequence of *B. iberica* isolate CBS 130984 from Algeria (GenBank Accession No. JN836991) showed 100% homology with sequences of *B. iberica* isolates obtained from dead and cankered bark of oaks from Spain and Italy (GenBank Accession Nos. AY573216, AY573214, AY573213, AY573210, AY573202, and AY573201). Stem inoculations were performed in the greenhouse on 10 4-year-old, grafted plants of *C. macrocarpa* growing in 5-liter pots using isolate CBS 130984. A 3-mm plug taken from the margin of a colony grown on PDA for 1 week was inserted in a circular wound of the same size made in the bark with a cork borer where the stem diameter was approximately 1 cm. Inoculations were repeated in June 2010 and June 2011. Five months after inoculations, small rounded to elongated lesions (1.0 to 2.5 cm long), sometimes with resin exuding cracks, were visible on all inoculated stems. Control trees, inoculated with sterile PDA plugs, showed no canker development. *B. iberica* was successfully reisolated from the necrotic bark surrounding the inoculation sites. No significant differences in canker size were observed between the two replicated experiments. Some *Botryosphaeria* species that are found on a variety of hosts are also known to cause cankers and dieback of cypress; among these are *B. stewensii, B. obtusa, B. dothidea*, and *B. ribis*, often acting as weak pathogens. Considered weakly virulent in causing dieback of grapevine and, to our knowledge, reported here for the first time on Cupressaceae, *B. iberica* caused cankers and dieback of *C. macrocarpa* trees that had probably been weakened by repeated drought events occurring in Algeria during the last 10 years. [G. Azouaoui-Idjer, G. Della Rocca, A. Pecchioli, Z. Bouznad and R. Danti (Algeria & Italy). Plant disease, 96(7):1073, 2012].

MOROCCO

First Report of the Cereal Cyst Nematode *Heterodera latipons* on Wheat in Morocco. From May to June 2011, during a survey of the wheat-growing areas in Meknes in the Saïs Region of Morocco, several cyst nematode populations were detected. Sampling was performed 1 month before wheat (*Triticum durum*) harvest, in fields showing patches of stunted plants. Plants were growing poorly, had chlorotic lower leaves, and a reduced numbers of ears. Root systems were short and had a bushy appearance because of increased secondary root production. No cysts were visible on the roots, but were found in the soil. Cysts were collected from soil on 200-µm sieves by the modified Cobb decanting and sieving method and identified by morphology and internal transcribed spacer (ITS)-rDNA sequencing. All isolates were identified as *Heterodera avenae* except the isolate from Aïn Jemâa. From the latter, key morphological features from cysts and second-stage juveniles (J2) were determined. The cysts (n = 10) had the following characteristics: bifenestrate vulval cone, body length without neck 590 µm (551 to 632 µm), body width 393 µm (310 to 490 µm), neck length 75 µm (65 to 90 µm), fenestra length 64 µm (60 to 72 µm) and width 21 µm (18 to 25 µm), underbridge length 96 µm (85 to 115 µm), vulval slit length 8 µm (7 to 9 µm), vulva bridge width 27 µm (24 to 33 µm), and bullae absent. The J2s (n = 10) had the following characteristics: body length 445 µm (412 to 472 µm), body width 19 µm (19 to 21 µm), stylet length 24 µm (23 to 25 µm), four lateral lines, tail length 50 µm (46 to 54 µm), and hyaline terminal tail 28 µm (24 to 31 µm). Values of the morphological characters were within the range of *H. latipons* reported by Handoo. The bifenestrate cysts with a strong underbridge and no bullae and J2 with a tail length greater than 40 µm, a stylet longer than 15 µm, and four incisures in the lateral field were typical for *H. latipons*. To confirm the identification, molecular observations were made. DNA was extracted from three juveniles from three different cysts separately. The ITS-rDNA region was amplified using the primers 5′-CGT AAC AAG GTA GCT GTA G-3′ and 5′-TCC TCC GCT AAA TGA TAT G-3′ as described by Ferris et al. This resulted in a 1,040-bp DNA fragment. The PCR-products were purified and sequenced (Macrogen, Inc., Seoul, Korea). All sequences obtained (GenBank Accession Nos. per cyst: JQ319035, JQ319036, and JQ319037) were

compared with sequences available from the GenBank database (www.ncbi.nlm.nih.gov), including several species of *Heterodera*. This comparison revealed a sequence similarity of 97 to 99% with *H. latipons* and 89% or lower with any other species of *Heterodera*. Morphological and molecular identification demonstrated that the population of cyst nematodes from a wheat field in Aïn Jemâa, Morocco was *H. latipons*. In the patches with poor growing plants, 65 cysts per 100 cm^3 soil were found. To our knowledge, this detection represents a new record of *H. latipons*. Since the nematode can cause considerable damage to wheat, one of the main cereals produced in Morocco, care should be taken to prevent the spread to other regions. [F. Mokrini, L. Waeyenberge, N. Viaene and M. Moens (Belgium& Morocco). Plant disease, 96(5): 774, 2012].

SUDAN

First Report of *Shallot virus X* in Onion in Sudan. Onion (*Alium cepa* L.) is among the most important vegetable field crops in Sudan. During a disease survey in crops (cvs. Kamleen Yellow and Abu-freua) conducted in 2010, samples showing mild mottling symptoms were collected from Shambat Research Station Farm, Khartoum North, Sudan. A CF-11 cellulose chromatography dsRNA preparation of a mixed onion leaf sample of five plants (20 g) resulted, apart from smaller dsRNAs up to 3 kbp, in a high molecular weight dsRNA of approximately 9 kbp. This dsRNA was used as a template for a random reverse transcriptase (RT)-PCR followed by cloning and sequencing of two randomly selected clones by the ABI BigDye Terminator v3.1 Cycle Sequencing Kit. Comparison with sequences available at GenBank revealed high identities to *Shallot virus X* (ShVX). ShVX is the type member of the genus *Allexivirus* (*Alphaflexiviridae*). One sequence obtained showed 84% nt and 98% aa sequence identity (genome position 414 to 1,285 of Accession No. M97264) to the replicase, whereas the other sequence partially covered the ORF4 and coat protein (CP) coding region (7,127 to 7,998). This sequence showed 80% nt (entire sequence) and 80/89% aa sequence identity to the ORF4 encoded protein/coat protein of a Russian ShVX isolate, respectively. ShVX was first reported in shallot in Russia and subsequently in the Netherlands, Germany, India, and New Zealand. To confirm the presence of ShVX in Sudan, 32 symptomatic leaf samples were collected in 2011 from different onion fields in Khartoum North, with a similar disease incidence compared to 2010. Thirty-one of these onion samples reacted positively in a double antibody sandwich-ELISA with a ShVX-specific antiserum (DSMZ AS-1042). Total RNA was extracted from five ShVX-ELISA positive onion samples using the RNeasy Plant Mini Kit (QIAGEN, Hilden, Germany) according to the manufacturer's protocol. Two primer pairs were also designed on the basis of sequences obtained in the random RT-PCR approach, targeting a 659-bp fragment of the coat protein region (ShVX-CPs 5′GTTGAATGTGGCGAGCGCAA3′ and ShVX-CPas 5′AGTGCAGAAGCCTTCCACA3′) or a 686-bp fragment of the replicase (ShVX-Rs 5′ATGTACTTCGGTACGGCATCA3′ and ShVX-R-as 5′TAATCGAATGAGGTCGGCCA3′). Fragments of the expected sizes were obtained for all positive samples. One RT-PCR product of each primer pair was directly sequenced, showing high sequence identities to those previously obtained (>98%). The random RT-PCR sequences obtained in this study were submitted to GenBank (JQ751056 and JQ751057). On the basis of the nucleotide sequences obtained with the dsRNA template, ShVX specific RT-PCR, and ELISA, the presence of ShVX in Sudan was confirmed in two consecutive years. To our knowledge, this is the first report of ShVX in Sudan and Africa, indicating this virus is more widespread than previously reported. The presence of ShVX also suggests the presence of its only known vector, the mite *Aceria tulipae*. The virus may have been introduced to Sudan by infected onion sets. Even if the impact of ShVX on onion production has not been determined, its identification and the availability of a diagnostic antiserum may be helpful to select virus-free propagation material in order to achieve sustainable onion production in Sudan. [K. Hamed and W. Menzel, M.E. Mohamed, G. Dafallah, A.M.A. Gadelseed and S. Winter (Sudan & Germany). Plant disease, 96(7): 1075, 2012].

TUNISIA

First Report of *Botryosphaeria obtusa* as Causal Agent of Olive Tree Branch Dieback in Tunisia. A branch dieback of olive trees (*Olea europaea* L. cv. Manzanilla de Sevilla) was observed in 2010 in an orchard (50 ha) located in the Testour region of northern Tunisia. More than 50% of trees were severely damaged by the disease. Symptomatic trees showed dead branches and wilted leaves, which remained attached to the shoots, and the affected tissues appeared abnormally dark compared with the inner bark of healthy branches. Numerous pycnidia were observed on the surface of the infected branches. For diagnosis, symptomatic stems were collected and small pieces of discolored tissues were excised from lesion margins, surface sterilized in 0.5% sodium hypochlorite for 1 min, rinsed and dried on sterilized filter paper, then placed on acidified Difco potato dextrose agar plates (APDA; 2.5 ml of 25% lactic acid per liter). Plates were incubated at 25°C for 4 to 5 days, and hyphal tips from developing fungal colonies were transferred to PDA and placed under fluorescent light (12 h/day). A fast-growing pycnidia-producing fungus was consistently isolated, with conidia exuding onto the agar surface of 10-day-old cultures. On the basis of colony characteristics, isolates were identified as *Botryosphaeria obtusa*. Conidia were large, dark brown, aseptate, rounded at both ends or truncate at base, and 25 to 26.8 × 10.5 to 12.03 µm. Pathogenicity tests were performed on detached stems of cv. Manzanilla by 7-mm diameter mycelial plugs cut from actively growing cultures of the fungus. Stems (30 cm length) were cleaned, surface sterilized with sodium hypochlorite (0.25% for 2 min), and wounded with a sterilized scalpel. Mycelial disks were placed over wounds and wrapped with Parafilm to prevent desiccation. Control

stems were mock inoculated with sterile agar plugs. Inoculated and control stems were placed in polyethylene boxes and incubated at 25°C. Inoculated stems developed brown discoloration 45 days later, and small dark pycnidia appeared on stem surfaces. Controls remained healthy. Koch's postulates were verified by isolating the fungus from symptomatic stems. To confirm the identification, DNA of one isolate was extracted and the fungal primers ITS1 and ITS4 were used to amplify the internal transcribed spacer region of rDNA. Purified amplicons were sequenced and a BLAST search of the GenBank database revealed 99% homology with *B. obtusa* isolate HO166525.1. The anamorph of the fungus, *Diplodia seriata*, has been recognized as the cause of fruit rot of olive and branch canker or dieback. To our knowledge, this is the first report of a canker disease of olive trees caused by *B. obtusa* in Tunisia. [M. Chattaoui, A. Rhouma M. Msallem, M. Pérez, J. Moral and A. Trapero (Tunisia & Spain). Plant disease, 96(6): 905, 2012].

TURKEY

First Report of *Cylindrocarpon macrodidymum* Associated with Black Foot Diseases of Grapevine in Turkey. Grape (*Vitis vinifera*) is widely planted and is an economically important crop in Turkey for domestic consumption and export. Black foot disease, caused by *Cylindrocarpon macrodidymum* Halleen, Schroers & Crous, is a recently identified but worsening problem in vineyards worldwide. Symptomatic grapevines show reduced vigor, shortened internodes, small leaves with interveinal chlorosis, and necrosis frequently leading to the death of the plants. Roots of symptomatic grapevines exhibit black, sunken, necrotic lesions with a reduction in root biomass. Pith of affected vines is discolored. During the summers of 2009 and 2010, a survey was carried out in 63 vineyards (4 to 15 years old) in six locations of Ankara Province. We collected 44 samples from roots and crowns of grapevines exhibiting black foot symptoms. In cross section, extensive necrosis at the base of the trunk and brown-black spots in xylem vessels were observed, resembling those previously reported for black foot disease. Isolations were made from roots, vascular elements, and pith tissue. In this study, 26 isolates were identified as *C. macrodidymum* on the basis of morphological characteristics. Isolates identified as *C. macrodidymum* had a dark orange-brown colony color and abundant aerial mycelia when grown on potato dextrose agar. Isolates produced ellipsoid or ovoid microconidia. The macroconidia were one to three septate, straight, and cylindrical. One-septate macroconidia were 24 to 32 × 5 to 7 µm; three-septate macroconidia were 26 to 40 × 5 to 6 µm. Chlamydospores developed in short, intercalary chains. Conidiophores were simple or complex and sporodochial. Isolate identities were confirmed by sequence analysis of the ribosomal DNA internal transcribed spacer (GenBank Accession No. HM245331) with primers ITS1 and ITS4. Isolates had 99% genetic identity with other isolates of *C. macrodidymum* present in GenBank. In pathogenicity tests, one representative isolate was used to inoculate five grapevine plants. Tests were completed by drench inoculation onto 3-month-old rooted cuttings of cv. Sultana with 25 ml of a conidia suspension (10^6 conidia ml^{-1}). Controls were inoculated with an equal volume of sterile distilled water. Plants were incubated for 4 months in a controlled environment facility at 25°C. After 3 to 4 months, inoculations resulted in reduction of root mass, and *C. macrodidymum* was reisolated from regions of brown streaking in wood and discolored vascular tissue in all inoculated plants, fulfilling Koch's postulates. Control plants were asymptomatic and *C. macrodidymum* was not recovered from control plants. To our knowledge, this is the first report of the presence of *C. macrodidymum* causing black foot disease on grapevine in Turkey. [S. Özben, F. Demirci and K. Değirmenci and S. Uzunok (Turkey). Plant disease, 96(5): 762, 2012].

First Report of *Phaeoacremonium scolyti* Associated with Esca and Petri Diseases of Grapevine in Turkey. Grapevine (*Vitis vinifera* L.) is a widely planted and economically important crop for production of raisin grapes, table grapes, and wine grapes in Turkey. Esca and petri diseases are two of the most important and destructive diseases of young and old vines worldwide. During the summers of 2009 and 2010, a survey was carried out in 63 vineyards in six locations of Ankara Province. Root and trunk samples were collected from 4- to 15-year-old grapevines showing esca and petri disease symptoms, including reduced trunk diameters, shortened internodes, stunted growth, chlorotic or necrotic leaves, and brown-to-black spots or streaks in the xylem vessels in cross or longitudinal sections of the rootstock trunk. Small pieces of internal tissues were surface disinfested in 1% sodium hypochlorite for 2 min, washed twice with sterile distilled water, and plated onto potato dextrose agar (PDA) amended with tetracycline hydrochloride (0.1 g $liter^{-1}$). Plates were incubated at 25°C in the dark for 14 to 21 days. *Phaeoacremonium* spp. were consistently isolated from necrotic tissues. Single-conidial isolates of these *Phaeoacremonium* spp. were grown on PDA, malt extract agar (MEA), and oatmeal agar (OA) in the dark at 25°C for 2 to 3 weeks until colonies produced spores. Of these, *Phaeoacremonium aleophilum* was the most prevalent species, however, one isolate identified as *P. scolyti* was described by L. Mostert et al. Conidiophores were mostly short and usually unbranched, subcylindrical to navicular, and often consisting of an elongate-ampuliform phialide. Phialides were terminal or lateral and pale brown to hyaline. Type II phialide were predominant. Type I phialide were 4 to 6 µm (average), type II phialide were 7 to 14 µm (average), and type III phialide were 14 to 20 µm (average). Conidia were hyaline, oblong-ellipsoidal, occasionally reniform or allantoid, 2.5 to 5 µm long (average), and 1 to 1.5 µm wide (average). Colony colors were reddish gray on PDA, pinkish white on MEA, and grayish pink on OA. Identity was confirmed by β-tubulin sequence analysis using primers T1 and Bt2b. Additionally, the β-tubulin gene fragment (primers T1 and Bt2b) of this isolate was sequenced (GenBank Accession No. JF909894). The sequence showed high similarity (99%) with the sequence of *P. scolyti* (GenBank Accession No. EU260415). Pathogenicity tests were completed using five, 3-month-old

rooted cuttings of cv. Sultana. A hole approximately 3 mm in diameter was drilled on the crown 2 cm aboveground level from the bark to the pith and filled with a 30-µl spore suspension (10^6 spores/ml) harvested from 21-day-old cultures grown on PDA at 25°C in the dark. Five control plants were used. Controls were inoculated with sterile distilled water. Filled holes were sealed with a sheet of Parafilm. The plants were incubated for 3 months in a controlled environment facility at 25°C. After 3 months, the fungus was reisolated from black discoloration of vascular tissue and pith tissue of the crown area of all inoculated cuttings, completing Koch's postulates. The black discoloration was more compact near the point of inoculation. Control plants were asymptomatic and *P. scolyti* was not recovered from control plants. To our knowledge, this is the first report of the presence of *P. scolyti* causing esca and petri disease of grapevine in Turkey. [S. Özben, K. Değirmenci, F. Demirci and S. Uzunok (Turkey). Plant disease, 96(5): 766, 2012].

New Records of Tenebrioninae and Pimeliinae (Coleoptera: Tenebrionidae) from Turkey. Three insect species belonging to subfamilies of Tenebrioninae and Pimeliinae of Tenebrionidae were determined as new records for Turkey. Specimens were collected from different regions of Turkey. With this study which aims to contribute to fauna of Turkey, the number of species belonging *Tentyria* and *Probaticus* from Turkey were increased. [Derya Canpolat and Abdullah Hasbenli (Turkey). Journal of the Entomological Research Society, 14(1): 15-20, 2012].

RESEARCH HIGHLIGHTS

EGYPT

Activity of Nemathorin, natural product and bioproducts against root-knot nematodes on tomatoes. An experimental study was carried out in pots to investigate the activity of Nemathorin, natural product and biopesticides against root-knot nematodes (RKNs) on tomatoes. Fosthiazate and abamectin proved to be the most effective treatments which suppressed the RKN population by 82.1%. Furthermore, arbuscular mycorrhizal fungus 2 (AMF2) was the superior treatment that reduced galls/root system followed by abamectin with the values of 72.5% and 67.2%, respectively. In addition, fosthiazate, cadusafos and crustacean2 gave the highest increase in the root length with the values of 55.8%, 54.6% and 54.6%, respectively. AMF2 was the most effective treatment which increases the root weight by 43.9%, while azadirachtin decreased the rootweight by 12.2% compared to untreated check. AMF2, cadusafos and crustacean2 not only increased the shoot length but also increased the shoot weight. Azadirachtin recorded the minimum increase in shoot system length and weight. [S.A. Abdel-Fattah Saad, Magdy A. Massoud, Hala S. Ibrahim and Mohamed S. Khalil (Egypt). Archives of Phytopathology and Plant Protection, 45(8):955-962, 2012]

***Bacillus thuringiensis* isolates from Egyptian soils and their potential activity against lepidopterous insects**. This study aims to search for indigenous *Bacillus thuringiensis* (*Bt*) strains from the soils of different locations representing 11 Egyptian governorates. A total of 2671 colonies from 93 soil samples were examined. The total number of *Bt* positive soil samples was 40/93 i.e. 43.01%. The results indicate that the percentage of the occurrence of *Bt* in these samples was 3.818%. The Egyptian soil showed to be rich in *Bt*. The evaluation of the potential activity of 40 positive soil isolates against *Spodoptera littoralis* and *Helicoverpa (=Heliothis) armigera* was carried out. Subsequently, LC_{50} and LC_{90} values and the potency of the *Bt* isolates were determined when applied against the target insects with reference to three standard preparations. [H. Salama, M. Saker, M. Salama, A. El-Banna, M. Ragaie and N. Abd El-Ghany (Egypt). Archives of Phytopathology and Plant Protection, 45(7):856-868, 2012].

Characterization of *Bacillus thuringiensis* mutant highly producing melanin pigment and active against potato tuber moth. The bacteria *Bacillus thuringiensis* mutant is highly producing melanin pigment with increased ultra violet resistance and insecticidal activity against the potato tuber moth *Phthorimaea operculella* (Zeller). The results showed that the high decrease of crystal protein formation rate ranged from 100% (*B.t.*EMS-M2 and *B.t.*EMS-M6) to 91.82% (*B.t.*EMS-M9). The EMS–UV-induced mutants (*B.t.*EMS–UV-2h-1, *B.t.* EMS–UV-2h-2, *B.t.*EMS–UV-2h-3, *B.t.*EMS–UV-2h-5, *B.t.*EMS–UV-4h-1, *B.t.*EMS–UV-4h-3 and *B.t.*EMS–UV-6h-2) showed 100% decrease in the crystal protein formation. Results also showed that the growth rate of *B. thuringiensis* isolates was detected by measuring the light absorption of culture broth (BP media at pH 8) at the wavelength of 600 nm. The absorbance values of the standard melanin were 2.055 and 0.134 at wavelengths of 226.5 and 602 nm, respectively. This means that the maximum absorbance at wavelength was 226.5 nm, this result is similar to that of the synthetic melanin which has the absorbance of 226 nm. Our experiments detected that the pigment extracted from the mutant isolate *B.t.*EMS-M3 (EMS-induced mutant) gave the maximum value of absorbance (2.615) at wavelength of 227.5 nm that was similar to standard melanin which gave absorbance value about 2.055 at a wavelength of 226.5 nm. This may be due to the genetic alterations that happened to the mutant isolates due to the mutation by EMS or/and UV irradiation. [Hassan Abdel-Latif A. Mohamed, M.M. Sabbour, M. Ragaei and Rasha Samy (Egypt). Archives of Phytopathology and Plant Protection, 45(5):547-560, 2012].

Effect of cannibalism on predation, oviposition and longevity of the predacious mite, *Agistemus exsertus* Gonzalez (Acari: Stigmaeidae). Cannibalism (intraspecific predation) on conspecific eggs was investigated in the predatory stigmaeid mite, *Agistemus exsertus* Gonzalez in the absence of eggs of *Tetranychus urticae* Koch (no-choice tests) and presence of three densities of prey eggs simultaneously (choice tests) in the laboratory. Data show that cannibalism occurs in immatures and adult females of the predator, which successfully developed and reproduced on conspecific eggs as an

alternative prey in the absence of prey eggs. In no-choice tests, cannibalism rate on conspecific eggs by *A. exsertus* stages was significantly lower than the predation rate on *T. urticae* eggs. The predatory mite exhibited a marked decline in oviposition rate when preyed on conspecific eggs compared with feeding on prey eggs. The developmental duration and longevity of *A. exsertus* females were significantly longer 1.9 and 1.7 times, respectively, when fed on conspecific eggs than feeding on *T. urticae* eggs. The propensity of the predator towards cannibalism depends on the prey density, when *T. urticae* eggs and conspecific eggs are present simultaneously. Provision of increased densities of prey eggs significantly decreased cannibalism and predation by *A. exsertus* stages, which fed generally less on conspecific eggs than on *T. urticae* eggs in choice tests. The oviposition rate of the predator increased significantly, as the egg density of the prey increased. The developmental period and longevity of *A. exsertus* females showed significantly gradual shortness with increasing egg density of the prey. [Aly H. Rasmy and S.A. Saber (Egypt). Archives of Phytopathology and Plant Protection, 45(8):977-985, 2012].

Efficacy of some granular nematicides against Root-knot nematode, *Meloidogyne incognita* associated with tomato. Five granular nematicides namely, cadusafos, carbofuran, ethoprop, fosthiazate and oxamyl were assessed against the root-knot nematode, *Meloidogyne incognita* on tomato based on numbers of galls and juveniles (J2) as well as on plant growth characteristics in a glasshouse. The rate of the formulated form of oxamyl, carbofuran or cadusafos was 0.1 g/kg soil, while it was 0.125 g / kg soil for fosthiazate and 0.25 g / kg soil for ethoprop. All nematicides caused reduction in root galls and J2 in the soil. However, fosthiazate had the highest nematicidal effect with 97.52 % reduction in galls and 96.45 % juveniles in soil, while cadusafos was relatively least effective causing 77.51 and 86.63 % reduction in galling and J2 population, respectively. Carbofuran, oxamyl and ethoprop ranked intermediate in descending order by 95.06 % and 94.26 %; 81.99 % and 87.60 %; 78.73 % and 87.88 %, respectively. However, none of the nematicides tested significantly affected shoot length, fresh shoot weight and root length compared to the untreated inoculated control. Except oxamyl, all of these nematicides significantly decreased root fresh weight. [Radwan, A.R, S.A.A. Farrag, M.M. Abu-Elamayem and N.S. Ahmad (Egypt). *Pakistan Journal of Nematolgy*, 30(1):41-47, 2012].

Insect pollinators of anise plants (*Pimpinella anisum* L.) and the important role of honey bees (*apis mellifera* L.) on their yield productivity. The present investigation aimed to identify the insect pollinators and the efficiency of honeybees in pollination of anise plant during flowering periods of 2008 and 2009 seasons at Assiut Governorate, Egypt. Obtained results indicated that the total insect counts attained 11 species, belonging to four orders; Hemiptera (one species), Coleoptera (two species), Diptera (five species) and Hymenoptera (three species). Honeybees were the most abundant of hymenopterous insects during anise flowering and the daily peak activities were detected between 12.00 noon and 2.00 p.m. for the two seasons. Regarding the effect of prevailing air temperature and relative humidity percentage (RH%) on the occurrence of insect pollinators, it is clear that the effects of the two factors were moderate in the two seasons. Also, the results showed a significant effect of open pollination on the seed yield/feddan (1024.12 kg) followed by honeybees pollination (781.55 kg), while insect exclusion recorded the lowest value (300.24 kg). [T.E. Abd El-Wahab, I.M.A. Ebadah and Y.A. Mahmoud (Egypt). Archives of Phytopathology and Plant Protection, 45(6):677-685, 2012].

Management of cucumber powdery mildew by certain biological control agents (BCAs) and resistance inducing chemicals (RICs). The efficiency of some commercial biological control agents (BCAs), Bio Zaid and Bio Arc, and resistance inducers chemicals (RICs) (salicylic acid and Bion) on management of cucumber powdery mildew, caused by *Sphaerotheca fuliginea*, was evaluated *in vitro* and *in vivo*. *In vitro* experiments revealed that application of the tested BCAs and RICs significantly reduced the disease severity, number of conidia per leaf area unit (cm) and reduced germination of conidiospores of the causal pathogen. Under field conditions, application of BCAs and RICs caused significant decrement in the disease severity with significant increment in the fruit yield compared with check treatments. On the average, application of Bion recorded the highest values, either in reducing the disease severity or in raising the average fruit yield followed by Bio Arc. On the other hand, applying salicylic acid (SA) recorded, on the average, the lowest efficiency in reducing disease severity and low values of fruit yield in both growing seasons. [Magd El-Morsi Awad, Kamal A. Abo-Elyousr and Montaser Fawzy Abdel-Monaim (Egypt). Archives of Phytopathology and Plant Protection, 45(6):652-659, 2012].

Nematicidal potentiality of some animal manures combined with Urea against *Meloidogyne arenaria* and growth and productivity of sugar beet under field conditions. Three animal culture manures viz., cattle manure (CM), sheep manure (SM) and chicken manure (ChM) at three rates as organic substances, in combinination with urea as inorganic fertilizer, were tested for their action against root-knot nematode, *Meloidogyne arenaria* infesting sugar beet and plant growth, yield and total soluble sugars (TSS %) under new reclaimed sandy loam field. Results indicated that all treatments at their rates significantly ($p \leq 0.05$ and / or 0.01) reduced females, galls and egg-mass numbers as compared to un-amended plants. All rates of Ch M treatment gave best results in protecting sugar beet plants and diminishing the nematode population densities in various stages. But, SM treatment with their rates ranked statistically in the second category. However, the three levels of CM treatment achieved the third category in managing the nematode. All treatments significantly improved infected sugar beet growth including yield and TSS %. There were positive correlations between the evaluated concentrations and the obtained reduction in numbers of the nematode stages and also all plant growth parameters including root weight (yield) and total soluble

sugars. [A.E. Ismail and M.M. Mohamed (Egypt). *Pakistan Journal of Nematolgy*, 30(1): 57-65, 2012].

IRAN

A survey on the overwintering larval parasitoids of *Ectomyelois ceratoniae* in three regions in Iran. Carob moth, *Ectomyelois ceratoniae* (Lepidoptera: Pyralidae) is the most important pest of pomegranate, *Punica granatum* (Punicaceae), in Iran. The most recommended procedure to control this pest is collecting and destroying infested fruits in the orchards at the end of cropping season to eliminate overwintering sites. In order to determine the parasitoid species and the parasitism percentage during fall-winter season (2006–2007) a study was conducted in three commercial pomegranate orchards in Varamin, Qom, and Saveh, (central Iran). Our results revealed that *E. ceratoniae* had numerous parasitoids from the families Braconidae and Ichneumonidae. *Apanteles myeloenta* Wilkinson (Hymenoptera: Braconidae) was the most prevalent species among the collected parasitoids in all studied sites. More parasitoids were found in fruits on trees than those on the ground. Fruits on the ground were more infested than fruits on trees. According to our results collecting and destroying the infested fruits in the orchards at the end of cropping season, had negative effects on parasitoids population and diversity. [Hossein Kishani-Farahani, Seyed Hossein Goldansaz and Qodrat Sabahi (Iran). Crop Protection, 36: 52–57, 2012].

Comparison of development and demographic parameters of *Diuraphis noxia* (Hem., Aphididae) and its parasitoid, *Diaeretiella rapae* (Hym., Braconidae: Aphidiinae). Demographic parameters of *Diuraphis noxia* (Mordvilko) and its parasitoid, *Diaeretiella rapae* (McIntosh) were investigated under laboratory conditions at temperatures of 20 ± 1 °C, 60 ± 5% relative humidity of 60 ± 5% and a photoperiod of 16: 8 (light: dark) hours. The survival rates (l_x) and the life expectancy (e_x) at the beginning of adult emergence were 86% and 25.81 days for *D. noxia* and 100% and 7.36 days for *D. rapae*, respectively. Based on the Weibull distribution parameters, the survival curves were type I for both *D. noxia* and *D. rapae*, which indicates that mortality mostly occurred in older stages. The r_m-values in aphid and parasitoid were obtained as 0.22 ± 0.002 and 0.19 ± 0.003day^{-1}, respectively. Mean generation time (*T*) and doubling time (*DT*) were 15.93 ± 0.202 and 3.15 ± 0.031 days for the aphid and 15.33 ± 0.071 and 3.67 ± 0.054 days for the parasitoid, respectively. The R_0 -values of *D. noxia* and *D. rapae* were evaluated 33.19 ± 0.961 and 18.07 ± 0.761 females/female/generation, respectively. The gross and net fecundity rates were 59.21 ± 1.94 and 32.825 ± 0.972 nymphs/female/day for the aphid and 37.59 ± 1.46, and 33.8 ± 1.51 eggs/female/day for the parasitoid, respectively. The results of this research indicated that *D. rapae* is an adequate parasitoid for control of Russian wheat aphid. [Zahra Tazerouni, Ali Asghar Talebi and Ehsan Rakhshani (Iran). Archives of Phytopathology and Plant Protection, 45(8):886-897, 2012].

Comparison of pathogenicity of *Clavibacter michiganensis* subsp. *Insidiosus* and *Pseudomonas viridiflava* strains on alfalfa. Hamedan province of Iran is a suitable niche for alfalfa growth but many diseases including alfalfa bacterial wilt, bacterial crown and root rot diseases cause economic crop losses. Bacterial wilt is caused by *Clavibacter michiganensis* subsp. *Insidiosus*, and bacterial crown and root rot diseases are caused by *Pseudomonas viridiflava*. In this study, we investigated the pathogenicity of *C. michiganensis* subsp. *Insidiosus* and *P. viridiflava* strains collected from the main alfalfa growing areas of Hamedan province. Pathogenicity of the virulent strains was tested on alfalfa and the bacterial strains caused symptoms, and data were collected about stem length, root length, wet weight and dry weight of the infected plantlets. The data about the pathogenicity of *C. michiganensis* subsp. *Insidiosus* and *P. viridiflava* on alfalfa were compared with each other and were analysed by SAS software and Dunkan's test. Resulted data showed more pathogenicity of *C. michiganensis* subsp. *Insidiosus* than *P. viridiflava* on alfalfa. These data also showed that both of these bacteria produced the most losses on wet weight and dry weight of alfalfa plantlets. [Ali Heidari and Gholam Khodakaramian (Iran). Archives of Phytopathology and Plant Protection, 45(8):922-931, 2012].

Demographic parameters of two spotted spider mite, *Tetranychus urticae* Koch (Acari: Tetranychidae) on cotton. Cotton has different economic value and two spotted spider mite, *Tetranychus urticae* Koch (Acari: Tetranychidae) is a serious pest in field crops around the world. The aim of this study was to assess demographic parameters of *T. urticae* on cotton. This study was under laboratory conditions: (28 ± 2)°C, (60 ± 5) Rh% and (L:D) (16:8) h on cotton leaf discs. Intrinsic rate of increase (r_m), net reproductive rate (R_0), finite rate of increase (λ), doubling time (DT) and generation time (*T*) were: 0.233 ± 0.006, 40.01 ± 3.33, 1.26 ± 0.01, 2.98 ± 0.08 and 15.86 ± 0.30. Net fertility rate, net fecundity rate and gross hatch rate calculated 53.34 ± 4.53, 57.35 ± 4.87 and 0.93 ± 0.00. The results showed that (e_x) life expectancy had a peak on day 16.25 and maximum egg per day was 9.52 on day 19. The results of our study provide the efficiency of its natural enemies in fields under environmental conditions. [Nazila Honarparvar, Mohammad Khanjani, Seyed Hamid Rexa Forghani, Hadi Ostovan and Ali Asghar Talebi (Iran). Archives of Phytopathology and Plant Protection, 45(4): 381-390, 2012**].**

Efficacy of some plants as a post-harvest protectant against some major stored pests. The toxicity of vapours of the essential oil of *Ferula gummosa, Elettaria cardamomum* and *Salvia officinalis* on the adults and larvae of some stored product pests was investigated. The bioassays were carried out in 70 mL vials containing 10 individuals of each insect. The LC_{50} values of fumigant bioassay after 24 h were calculated. Results indicated that the effect of the essential oil of *F. gummosa* was stronger than *E. cardamomum, S. officinalis* on stored pests. Also fumigant toxicity of *S. officinalis* on *Sitophilus oryzae* was

similar to that of *Sitophilus granarius* adults. On the other hand, *R. officinalis* had a good effect on adults of *Tribolium castaneum* and larvae of *Ephestia kuehniella*. According to our results and good effect of these compounds, they will be a safe replace for chemical compounds in the future. [Mohammad Mahmoudvand, Habib Abbasipour, Fahimeh Rastegar, Mohammad Hossein Hosseinpour and Moslem Basij (Iran). Archives of Phytopathology and Plant Protection, 45(7): 806-811, 2012].

Inhibitory effect of some plant crude extracts against cucumber damping-off agents. This study was aimed to investigate the antifungal effect of the crude extracts derived from 37 Iranian plant species against *Phytophthora melonis* and *Pythium aphanidermatum,* the causal agents of cucumber root rot and damping off. The crude extracts were obtained using three different solvents; ethanol, methanol and water. The inhibitory effect of these extracts was examined based on the paper disc diffusion method (5 mg per paper disc) with four replications. The ethanolic extract of *Acroptilon repens*, that showed a remarkable inhibitory effect on the tested oomycetes was selected for further examination. To determine the most effective component, the ethanolic extract of *A. repens* was fractionated by thin layer chromatography (TLC) and each fraction was tested for the antifungal activity. The potential of the ethanolic extract of *A. repens* in the control of cucumber damping off agents was evaluated in a completely randomized design with eight replications, under greenhouse conditions. Based on the results obtained from the screening of TLC fractions, it was found that a fraction with Rf value equal to 0.89 had the most inhibitory effect against the tested oomycetes. Greenhouse experiment showed that the soil treatment by the ethanolic extract of *A. repens* at all the selected concentrations (0.2, 0.4 and 0.6 g per plastic pot) were significantly effective in reducing the disease incidence caused by *P. melonis* compared to the control. Moreover, seed treatment by 10% w/w of ethanolic extract of *A. repens* significantly suppressed damping off symptom caused by *P. aphanidermatum*, when compared to the control. [Samira Ghasemi, Saeed Abbasi, Sohbat Bahraminejad and Behrouz Harighi (Iran). Australasian Plant Pathology, 41(3): 331-338, 2012].

Molecular genotyping of *Sclerotinia sclerotiorum* isolates from different regions and host plants in Iran. Genetic variation among *Sclerotinia sclerotiorum* isolates from different regions and host plants were investigated using pathogenicity test, mycelial compatibility groups (MCGs) and molecular markers. Six MCGs were identified and significant differences of virulence variability were observed within and among MCGs. Cluster analysis of combined repetitive sequence-based polymerase chain reaction and randomly amplified polymorphic DNA data discriminated 12 isolates into 11 genotypes, indicating high level of genetic polymorphism among tested isolates. Twelve isolates clustered into four major groups corresponding to their hosts andgeographical region. The variability found within closely related isolates of *S.sclerotiorum* indicated that such morphological and molecular markers are useful in population studies of this pathogen. [Elham Karimi, Naser Safaie and Masoud Shams-bakhsh (Iran). Archives of Phytopathology and Plant Protection, 45(8):942-954, 2012].

Occurrence of *Impatiens necrotic spot virus* and *Tomato spotted wilt virus* on Potatoes in Iran. There have been an increasing number of records of the natural infection of various crops and ornamentals in Iran with *Impatiens necrotic spot virus* (INSV), *Tomato spotted wilt virus* (TSWV), and Tomato yellow fruit ring virus (TYFRV), a recently proposed species in the genus *Topovirus*. TYFRV, originally believed to be TSWV and named as such, has been previously reported to occur in Iranian potato fields. During the growing seasons of 2004 to 2006, surveys were conducted in potato fields in different potato-producing (*Solanum tuberosum*) provinces of Iran (Ardabil, Azarbayejan-e-sharqi, Chaharmahal-va-bakhtiyari, Esfahan, Hamedan, Kerman, Khorasan, Khuzestan, Lorestan, Tehran, Qazvin, and Zanjan) to detect the presence of *Tospovirus* spp. infecting this crop, including *Groundnut ringspot virus* (GRSV), INSV, *Iris yellow spot virus* (IYSV), *Tomato chlorotic spot virus* (TCSV), TSWV, TYFRV, and *Watermelon silver mottle virus* (WSMoV). Overall, 186 fields were surveyed, and 2,823 potato leaf samples from plants showing tospovirus-like symptoms of chlorotic or necrotic spots, chlorosis, and necrosis were collected before or through the flowering stage, approximately 50 to 90 days after planting. Each leaf sample was tested by double-antibody sandwich (DAS)-ELISA using specific antisera (Bioreba, Reinach, Switzerland; Loewe, Sauerlach, Germany; DSMZ, Braunschweig, Germany) for the presence of the aforementioned tospoviruses. TYFRV, TSWV, and INSV were found in 24.0, 4.1, and 0.4% of the samples collected from 133, 51, and 7 fields surveyed, respectively. None of the samples had a positive reaction in ELISA to GRSV, IYSV, TCSV, and WSMoV. To confirm this testing, a number of the leaf samples that were found to be positive for INSV, TSWV, and TYFRV in ELISA tests were mechanically inoculated on *Petunia × hybrid* and *Nicotiana benthamiana*; the inoculated plants showed typical necrotic local lesions of tospoviruses and chlorotic or necrotic spots followed by systemic infection, respectively; their infection was subsequently confirmed by ELISA. The samples also were tested by reverse transcription-PCR technique using previously described specific primers. The PCR reaction resulted in the specific amplification of a 0.59-, 0.71-, and 0.67-kb (or 1.2-kb) fragment of INSV, TSWV, and TYFRV RNAs, respectively. This study showed that tospoviruses, especially TYFRV, are widespread in Iranian potato fields. It is hoped that the results may help us to improve a seed potato certification program in the future. To our knowledge, this is the first report of INSV and TSWV from potatoes in Iran. [R. Pourrahim, A. R. Golnaraghi and Sh. Farzadfar (Iran). Plant disease, 96(5): 771, 2012].

Phylogenetic Analysis on Some Iranian White Grubs with New Data about Natural Pathogen of Polyphylla adspersa. Three species of white grubs, *Polyphylla olivieri*, *P. adspersa* and *Melolontha melolontha* (Scarabaeidae: Melolonthinae) are among the serious

economically important pests in Iran. Larval identification of those species is a difficult issue. Here, we provided DNA barcodes for these species of scarabids using mitochondrial DNA cytochrome oxidase I (COI). The relationship between these three species of Iranian white grubs and related species was addressed. Among these species, *P. adspersa* is the predominant species in North-East of Iran, Khorasan provinces.The isolation of an unknown pathogen indicated the incidence of a natural infection by a species of entomopathogenic nematode from *Heterorhabditis* genus. Classic data as well as molecular characterization of this insect pathogen using ITS sequences confirmed the occurrence of *H. bacteriophora* in natural populations of *P. adspersa*. This is the first data about DNA barcodes of Iranian white grubs as well as new record for natural entomopathogen of *P. adspersa* larvae. [Javad Karimi, Reyhane Darsouei, Somayeh Fattaho-hosseini and Hussein Sadeghi (Iran). Journal of the Entomological Research Society, 14(1): 1-13, 2012].

Temperature-Dependent Functional Response of *Diaeretiella rapae* (Hymenoptera: Braconidae), a Parasitoid of *Diuraphis noxia* (Hemiptera: Aphididae). The effects of host density and temperature on the functional response of *Diaeretiella rapae* (M'Intosh) parasitizing *Diuraphis noxia* (Mordvilko) were evaluated at six constant temperatures (10, 15, 20, 25, 30 and 32.5°C) and six host densities (2, 4, 8, 16, 32, and 64 numbers). A type II functional response was obtained at all temperatures tested. The maximum parasitism rate was observed in density of 64 hosts, ranged from 3.00±0.67 at 10°C to 24.20±0.94 at 25°C. The searching efficiency (*a*) was highest at 15°C and then decreased linearly as the temperature increased to 32.5°C. The searching efficiency ranged from 0.080±0.008 h-1 at 15°C to 0.032±0.017 h at 10°C. The estimated value of handling time (*Th*) decreased linearly with increasing temperature from 10 to 25°C. The maximum rate of parasitization was observed at 15, 20 and 25°C (32.94, 32.22 and 36.51 nymphs/24 h, respectively). The results suggest that *D. rapae* has potential as a biocontrol agent of *D. noxia* and warrants further evaluation in the field conditions. [Zahra Tazerouni, Ali Asghar Talebi and Ehsan Rakhshani (Iran). Journal of the Entomological Research Society, 14(1): 31-40, 2012].

Using different amounts of vacuum and acrolein in various exposure periods to control two insects of stored products. In this research, adults of *Tribolium castaneum* (Herbst) and *Rhyzopertha dominica* (Fabricius) were exposed to various air pressures solely (first phase) and air pressures together with acrolein (second phase) in various durations and mortality rates were determined. Complete mortality of *T. castaneum* was obtained at 1, 3 and 6 h after exposure to 10, 30 and 50 mmHg, respectively. *R. dominica* showed 96.25% and 60% mortality during 3 and 10 h exposed to 10 and 30 mmHg, respectively. Percentage mortality of the insects in second phase was significantly higher than the rate in first phase. *T. castaneum* was more susceptible than *R. dominica* in the both phases. [Mojtaba Ghane Jahromi, Ali Asgar Pourmirza, Golam Reza Sadeghi and Seyed Ali Hoseini (Iran). Archives of Phytopathology and Plant Protection 45(5):526-533, 2012].

MOROCCO

Occurrence of fumonisins B1, B2 and B3 in breakfast and infant cereals from Morocco. A total of 68 cereal products (48 breakfast cereals and 20 infant cereals) were collected from supermarkets and pharmacies in the Rabat-Salé area of Morocco and the content of fumonisins (FB1, FB2 and FB3) was analysed. Samples were extracted with a mixture of acetonitrile/water (85/15, v/v) by using an ultra-turrax homogenizer. Mycotoxins were then identified and quantified by liquid chromatography/tandem mass spectrometry. Results showed that fumonisins were detected in 20 samples (18 breakfast cereals and 2 infant cereals) with a frequency of contamination of 29.4% of total samples. The most contaminated products were cornflakes (maize) and breakfast cereals (rice, maize and cacao) with 10 and 4 positive samples respectively. The highest value was found in a breakfast cereal with 228 µg kg-1 of total fumonisins. [Naima Mahnine, Guiseppe Meca, Monica Fernandez-Franzon, Jordi Manes and Abdellah Zindine (Morocco). *Phytopathologia Meditrranea*, 51(1): 198-206, 2012].

OMAN

Characterization and pathogenicity of fungi and oomycetes associated with root diseases of date palms in Oman. Date palm is the most important crop in Oman and the Arabian Peninsula. A study was conducted to investigate fungal and oomycete pathogens associated with root diseases of date palms in Oman. Isolations were done from date palm roots showing root rot/necrosis symptoms. The root samples were collected from 111 date palm trees representing 29 different date palm cultivars. Morphological and molecular identification of the isolated fungi and oomycetes showed that they belong to 34 different fungal and oomycete species. *Fusarium solani* (27%), *Ceratocystis radicicola* (25%) and *Lasiodiplodia theobromae* (19%) were found to be the most common pathogens associated with root diseases of date palms. Pathogenicity tests on seedlings of date palm cv. Khalas showed that 21 fungal and oomycete species are pathogenic on date palm seedlings. The pathogenic species produced root rot, root necrosis or wilt symptoms upon inoculation on date palm seedlings. A total of 1, 7, 13 and 10 fungal and oomycete pathogens were found to be aggressive, moderately aggressive, weak and non-pathogenic on date palm seedlings, respectively, with *C. radicicola* being the most aggressive. Among the 21 pathogenic species, 13 are reported in this study for the first time as new root pathogens of date palm on a global basis. These include *Ceratocystis omanensis*, *Cochliobolus hawaiiensis*, *Exserohilum rostratum*, *Corynascus kuwaitiensis*, *Fusarium brachygibbosum*, *Fusarium acuminatum*, *Fusarium redolens*, *Fusarium thapsinum*, *Nigrospora sphaerica*, *Phoma multirostrata*, *Pythium indigoferae*, *Pythium*

spinosum and *Pythium ultimum* var. *ultimum*. In addition, this study reports for the first time the occurrence of 22 fungal and oomycete species in Oman. [A.M. Al-Sadi, A.H. Al-Jabri, S.S. Al-Mazroui and I.H. Al-Mahmooli (Oman). Crop Protection, 37:1-6, 2012].

PAKISTAN

Effect of cucumber mosaic virus infection on morphology, yield and phenolic contents of tomato. Ten tomato genotypes were screened for their resistance against cucumber mosaic virus (CMV) and its vector *Myzus persicae* under natural infection in field, using aphids *M. persicae* under net-house and mechanical inoculation under greenhouse. Large differences were observed among genotypes for infection percentage (IP) and severity index (SI) among the testing methods used. All genotypes showing tolerance to CMV in the field or through aphid inoculation, however, become susceptible and highly susceptible after mechanical inoculation. All the test genotypes also showed susceptibility to the aphid *M. persicae* population. Plants inoculated with CMV showed substantial decrease in yield and yield-contributing parameters which varied with cultivars that probably depended upon its genetic make up. All the test genotypes exhibited 0.97–30.19% decrease in plant height, 11.47–52.65% decrease in root length, 46.56–95.56% decrease in fresh plant weight, 65.78–92.84% decrease in root fresh weight, 19.97–87.65% decrease in the dry weight of plants, 75.63–95.43% decrease in dry root weight, 69.51–95.65% reduction in the number of fruits and 89.04–99.89% decrease in yield per plants. After 15 days of inoculation, the quantitative analysis using double beam spectrophotometer showed an increase in total phenolics in CMV-inoculated plants as compared to un-inoculated plants among genotypes. Similarly the thin layer chromatography (TLC) on silica gel G indicated that the number of phenolic compounds was increased in most of the inoculated genotypes while in others they were either decreased or remained same. [K.P. Akhtar Mahjabeen, N. Sarwar, M.Y. Saleem, M. Asghar, Q. Iqbal and F.F. Jamil (Pakistan). Archives of Phytopathology and Plant Protection, 45(7):766-782, 2012].

Effects of *Penicillium* extracts on germination vigour in subsequent seedling growth of tomato (*Solanum lycopersicum* L.). *Penicillium* spp. are well known to produce a variety of beneficial metabolites for plant growth and survival, as well as they defend their hosts from attack of certain pathogens. In this study, effects of culture filtrate of different *Penicillium* spp. were tested on tomato seeds. On the whole, presoaking of seeds in the filtrates of the nine *Penicillium* isolates tested significantly increased seed germination when compared with the control seeds. Cultural extracts of *P. expansum* and *P. bilaii* were highly effective in growth promotion up to 90%. It was also observed that *P. implicatum* and *P. oxalicum* significantly enhanced the root growth in tomato seedling as compared to other species. In case of shoot length, *P. verrucosum* (3.38 cm), *P. granulatum* (2.81 cm) and *P. implicatum* (2.62 cm) were effective. *P. implicatum* was quite promising in increasing shoot and root length in tomato seedlings, while *P. simplicissimum* and *P. citrinum* were less effective on seedling growth. The plant growth-promoting ability of *Penicillium* strains may help in growth promotion in other plants and crops. *Penicillium* spp. are already known for producing various mycotoxins and enzymes. Plant growth-promoting ability of *Penicillium* spp. will open new aspects of research and investigations. The role of *Penicillium* spp. in tomato plant growth requires further exploration. **[**Sobia Mushtaq, Ghazala Nasim, Ibatsam Khokhar and Irum Mukhtar (Pakisatn). Archives of Phytopathology and Plant Protection, 45(8):932-937, 2012].

Evaluation of nematicidal effects of *Cannabis sativa* L. and *Zanthoxylum alatum* Roxb. against root-knot nematodes, *Meloidogyne icongnita*. In view of the recently increased interest in developing plant origin nematicides as a surrogate to chemical nematicides, the present study was carried out to assess the nematicidal potential of two antagonistic plants *Cannabis sativa* L. (Cannabaceae) and *Zanthoxylum alatum* Roxb. (Rutaceae) against the most devastating root-knot nematode, *Meloidogyne incognita* responsible for colossal yield losses in cucumber. The leaves of *C. sativa* and *Z. alatum* were incorporated in the soil at the rate of 0, 2, 4, 6, 8, 10 and 20 g per kg of soil. After decomposition, cucumber (cv. Royal Sluis) seeds were sown and inoculated with 2000 s stage juveniles of *M. incognita* ten days after emergence. Data on growth variables and nematode infestations were recorded after six weeks of inoculation. Both the plants significantly reduced nematode infestations and enhanced plant growth criteria compared to the untreated check. The reductions in number of galls, egg masses, nematode fecundity and build up caused by *C. sativa* were significantly higher as compared to *Z. alatum*. Maximum reductions in these variables were recorded with 20 g dosage. The addition of *C. sativa* and *Z. alatum* to the soil as organic amendment can work very well as nematicides and can be successfully used for controlling root-knot nematodes replacing traditional chemical treatments and avoiding environmental pollution. [Muhammad Zameer Kayani, Tariq Mukhtar and Muhammad Arshad Hussien (Pakistan). Crop Protection, 39: 52-56 2012].

Mass production of eight Pakistani strains of entomopathogenic nematodes (Steinernematidae and Heterorhabditidae). Eight nematode species of the genera *Steinernema* and *Heterorhabditis* viz., *Steinernema pakistanense, S. asiaticum*, *S. abbasi*, *S. siamkayai, S. carpocapsae*, *S. feltiae, Heterorhabditis indica* and *H. bacteriophora* were cultured *in vivo* on three insect species, *in vitro* on soya flour, wheat flour, lipid media, corn flour and on assemblage culture on *Galleria mellonella* larva and lipid modified media for mass scale to assess their production potential. On *in vivo* culture at the highest concentration the production of infective juveniles were 60 $\times 10^4$ to 87.4 $\times 10^4$ IJs from each larva of *G. mellonella* 4.2 $\times 10^4$ to 9.8 $\times 10^4$ IJs from each adult of *Callosobruchus chinensis* and 0.3 $\times$ 10*4* to 1.7 $\times 10^4$ IJs from each larva of *Tribolium castaneum*. Soya flour medium gave the highest

population as compared to other media. The minimum multiplication was found in corn flour medium. As compared to cultured separately, the production of infective juveniles increased approximately two fold in assemblage medium. *In vivo* production of IJs in *G. mellonella* larvae and *in vitro* soya flour medium were also exposed to four different temperatures. Maximum production of all other species was found at 32 ± 2˚C, except *S. feltiae* which gave highest production at 20 ± 2ºC. The present investigation can be valuable for selecting strains of entomopathogenic nematodes for mass production on large scale to provide protection to crops against insects. [J. Salma and F. Shahina (Pakistan). *Pakistan Journal of Nematol*ogy, 30(1): 1-20, 2012].

Occurrence of toxigenic fungi in maize and maize-gluten meal from Pakistan. The present study was designed to isolate and identify toxigenic mycoflora of maize and maize-gluten meal. A total of 82 samples of maize and 8 samples of maize-gluten meal were collected from Faisalabad district of Pakistan over a period of two years. These samples were inoculated on different culture media. Fungal contamination of maize and maize-gluten was 56% and 75% of samples, respectively. Isolation frequencies of different genera isolated from maize were *Aspergillus* 33%; *Penicillium* 28%; *Fusarium* 10%; and *Alternaria* 1%. Isolation frequency among species was maximum for *P. verrucosum*, followed by *A. niger* aggregates, *A. ochraceous*, *A. flavus*, *P. chrysogenum*, *A. parasiticus*, *A. carbonarius*, *Fusarium* spp. and *Alternaria* spp. Relative density of *Aspergillus* isolates was maximum for *A. niger* aggregates and *A. ochraceous* (30% each) followed by *A. flavus* (26%), *A. parasiticus* (11%) and *A. carbonarius* (3%). Percentage of toxigenic fungi among *Aspergillus* isolates was 52%. Aflatoxigenic isolates of *A. flavus* and *A. parasiticus* were 43 and 67% and ochratoxigenic isolates of *A. carbonarius*, *A. ochraceous* and *A. niger* aggregates were 100, 63 and 38%, respectively. *Aspergillus parasiticus* produced higher concentrations of AFB1 (maximum 1374.23 ng g-1) than *A. flavus* (maximum 635.50 ng g-1). Ochratoxin A production potential of A. ochraceous ranged from 1.81 to 9523.1 ng g-1, while in *A. niger* aggregates it was 1.30 to 1758.6 ng g-1. Isolation frequencies of fungal genera from maize-gluten meal were *Aspergillus* (63%) and *Penicillium* (50%). *A. flavus* was the most frequently isolated species. Percentage of toxigenic fungi among *Aspergillus* isolates was 40%. Aflatoxigenic isolates of *A. flavus* were 33% and ochratoxigenic isolates of *A. ochraceous* were 100%. **[**Muhammad Kashif Saleemi, Muhammad Zargham Khan, Ahrar Khan, Ijaz Javed, Zahoor Ul Hasan, Muhammad Raza Hameed, Sohail Hameed and Muhammad Amer Mehmood (Pakistan). *Phytopathologia Meditrranea*, (5191): 219-224, 2012].

SAUDI ARABIA

Tropical grasshopper glutathione-*S*-transferase and detoxification of plant allelochemicals in *Calotropis procera.* *Poecilocerus bufonius* inhabits Saudi Arabia and uses *Calotropis procera* as its main host plant. Cardenolids of this plant are used by this grasshopper as chemical defence against the natural enemies. The activity of enzyme detoxification in mid-gut wall for these allelochemicals has been determined in this study. Results indicate that the activity of glutathione-*S*-transferase (GST) was significantly higher after 24 hours of feeding on the main host plant but no difference has been found after one, two, four and five hours of feeding. [G. Elsayed, Mohamed M. Ahmed, Samy M.H. Sayed and Sayed A.M. Amer (Saudi Arabia & Egypt). Archives of Phytopathology and Plant Protection, 45(6):707-711, 2012].

SYRIA

Characterization of potato and tobacco isolates of Cucumber mosaic virus from Syria and the first report on CMV satellite RNA from potato. Cucumber mosaic virus (CMV) has been reported from potato production areas in Europe, USA, Japan and more frequently in regions with warm climates such as Egypt, India, Saudi Arabia and Syria. As it is considered as an uncommon virus in potato, the characterization of potato isolates of CMV is far behind those from other hosts. In addition to potato, CMV is a common virus infecting many crops in Syria, but nothing is known about its molecular characteristics. The present study aimed to characterize Syrian CMV isolates collected from potato and neighboring tobacco fields. All potato isolates of CMV (total of four) co-infected potato plants with Potato virus Y (PVY) which is the most frequent potato virus in Syria. According to the sequence analyses of the coat protein (CP) coding region, three potato and three tobacco CMV isolates were found to be closely related regardless of the host species or geographic origin, and all belonged to the IA strain subgroup of CMV. A potato CMV isolate, PoCMV7-5, readily infected solanaceous plants in which it induced systemic infection, but was less infectious to other hosts including those of Leguminosae and Cucurbitaceae. When inoculated on potato plants, PoCMV7-5 alone or with various PVY strains was able to cause local but not systemic infection in all potato cultivars inoculated. PoCMV7-5 contained heterogeneous variants of satellite RNA which varied in length due to A or/and T deletion/insertion at approximate nucleotide position 225–240. This is the first report on CMV satellite RNA from potato. [Mohamad Chikh Ali, Abdul Mohasen Said Omar, Tetsuo Maoka, Keiko T. Natsuaki and Tomohide Natsuaki (Syria & Japan). *Phytopathologia Meditrranea*, 51(1(: 3019, 2012].

TURKEY

Population Fluctuation of Thrips Species (Thysanoptera: Thripidae) in Nectarine Orchards and Damage Levels in East Mediterranean Region of Turkey. The occurrence and population fluctuation of thrips (Thysanoptera) and damage to nectarines were studied in four orchards at two locations Adana and Mersin in the east Mediterranean Region of Turkey during 2005

and 2006. Direct sampling of nectarine flowers before petal fall revealed 12 thrips species with, western flower thrips, *Frankliniella occidentalis* (Pergande) the most common and abundant species followed by *Thrips tabaci* Lindeman and *Thrips major* Uzel. Adult thrips were first recovered from flowers during early bloom whilst thrips larvae (first instars) were first detected at the beginning of petal fall. The highest average number of thrips per flower (0.65 adults, 0.45 larvae in 2005; 3.80 adults, 4.92 larvae in 2006) were in an orchard located in Mersin where the most thrips damage to fruit was recorded. Damage was the least in an orchard in Adana where the thrips abundance in the flowers were the lowest. Therefore, a direct correlation between damage to fruit and abundance of thrips in the flowers could be inferred. Thrips were also counted from sticky traps from flowering until trap catches ended in the Fall. Thrips populations generally peaked once in all orchards except Alifakılı/Mersin where up to 4 peaks occured until harvest. The highest trap catches during the bloom period were recorded in Alifakılı orchard where the most fruit damage was noted in both years. It is concluded that the data from direct counts in flowers and trap counts during the bloom period could be a suitable prediction method for estimating fruit damage. In the trial orchards, fruit damage for both years ranged between 17.7% and 73.8 % depending on the orchard. This study indicated that two insecticide applications during flowering period; one at the beginning and one at the end of petal-fall stage is needed and therefore suitable insecticides should be registrated for thrips control in nectarines. [Adalet Hazir and Mehmet Rifat Ulusoy (Turkey). Journal of the Entomological Research Society, 14(1): 41-52, 2012].

Tachinid (Diptera: Tachinidae) Parasitoids of Overwintered *Hyphantria cunea* (Drury) (Lepidoptera: Arctiidae) Pupae in Hazelnut Plantations in Samsun Province, Turkey. The fall webworm, *Hyphantria cunea* (Drury) (Lepidoptera: Arctiidae), is an exotic, defoliating larval pest in Europe and Asia. More than 4,000 overwintered pupae of *H. cunea* were collected from hazelnut plantations in Samsun province, Turkey in 2008 and 2009. Two tachinid species, *Compsilura concinnata* and *Nemoraea pellucida*, were reared in both 2008 and 2009. Species richness at sites ranged from 1 to 2 species. Parasitism was 2.4 times higher in 2009 than in 2008. The highest total parasitism for any site was 23.6% in 2009. *Nemoraea pellucida* parasitised 2.4% of all pupae collected, was responsible for 94.6% of all tachinid parasitism, and had the highest parasitism rate of 19.4% for any site. *Compsilura concinnata* parasitised 0.14% of all pupae and was responsible for 5.4% of tachinid parasitism. [Gregory Thomas Sullivan, Ismail Karaca, Sebahat K. Ozman-Sullivan and Kenan Kara (Turkey). Journal of the Entomological Research Society, 14(1): 21-30, 2012].

❖Some Plant Protection Activities of FAO and Other Organizations

DESERT LOCUST SITUATION

General Situation of the Desert Locust during June 2012 Forecast until mid-August 2012, Provided by the FAO Emergency Center for Desert Locust

The Desert Locust situation remained serious during June as adult groups and small swarms migrated from the outbreak area along both sides of the Algerian-Libyan border to the northern Sahel in Mali and Niger where rains have fallen about six weeks earlier than normal. Survey and control teams were mobilized in Niger but were limited by insecurity and a shortage of funds. Similarly, operations could not be carried out in northern Mali where locals reported small swarms. Breeding will occur in northern Mali and Niger, giving rise to hopper groups and bands in July and adult groups and swarms in August. Unless controlled, the infestations will continue to increase and threaten crops and pastures. Depending on rainfall and control operations, a second generation could occur in September, leading to a substantial increase in locust numbers. Consequently, the situation is potentially dangerous. Elsewhere, the situation remained calm during June and no significant developments are expected during the forecast period.

Western Region. As vegetation dried out along both sides of the Algerian-Libyan border, adults formed small groups and swarms in inaccessible areas and moved south to northern Niger and northern Mali during the first half of June. Some adults were mature and ready to lay eggs. Most of the groups and swarms remained in the north but a few groups reached pasture areas in central Niger and started to lay eggs. Although there were no reports of locusts in Chad, there is a possibility that a few groups may have reached northern areas of the country. A few adults were reported in southeast Mauritania. Control teams in Niger treated 960 ha. Control operations ended in Algeria, treating 42,140 ha since January of which 987 ha were in June. No locusts were reported after mid-June in Libya where 21,400 ha were treated from February to the end of May. During the forecast period, hatching will occur in Mali and Niger during July, causing hopper groups and bands to form and giving rise to adult groups and swarms in August. Small-scale breeding is expected to take place in Mauritania and Chad. All efforts are required to conduct the necessary survey and control operations.

Central Region. No locusts were seen in the region during June except for small hopper and adult infestations in northeastern Oman, where light damage was reported on crops and date palms. Small-scale breeding will occur during the forecast period in the interior of Sudan and western Eritrea, causing locust numbers to increase slightly. Regular surveys are recommended in both countries.

Eastern Region. Locust numbers declined in the spring breeding areas in western Pakistan as conditions dried out during June. Only a few adults persisted in parts of the interior and coastal areas in Baluchistan. Low numbers of solitarious adult appeared in the summer breeding areas in Cholistan, Pakistan near the Indian border. During the forecast period, small-scale breeding will occur along both sides of the Indo-Pakistan border, causing locust numbers to increase slightly but remain below threatening levels.

For more up to date information about the Desert Locust situation and forecasts, visit the FAO's Desert Locust website:
http://www.fao.org/ag/locusts/en/info/info/index.html

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

SUB-REGIONAL TRAINING WORKSHOP FOR GCC COUNTRIES & YEMEN ON APPLICATION OF THE PHYTOSANITARY MEASURES MANAMA, KINGDOM OF BAHRAIN, 01 – 04 JULY 2012

The FAO Regional Office for the Near East in cooperation with the International Plant Protection Convention (IPPC) and the Ministry of Municipalities and Urban Planning and Agriculture Affairs in Kingdom of Bahrain organized a training workshop on application of the Phytosanitary Measures related to the international trade.

The training workshop was held in Manama, Kingdom of Bahrain, during the period 1- 4 July, 2012.

The training workshop aimed at building the capacity of the plant quarantine officers, inspectors, custom inspectors and private sector representatives from Bahrain and participants from GCC countries and Yemen for better understanding of requirements and practical application of international standards related to international trade with focus on the (ISPM-15), regarding the regulation of wood packaging material in international trade and (ISMP-20), the guidelines for a phytosanitary import regulatory system.

The International Standards for Phytosanitary Measures (ISPMs) developed by the IPPC aim at providing guidelines and recommendations for harmonization of the phytosanitary measures at the global level to facilitate international trade of plant products and to avoid any unjustified barriers in International trade. The International Standards for Phytosanitary Measures (ISPMs) are also the basis for phytosanitary measures applied by members of the World Trade Organization (WTO) under the Convention on the application of Sanitary and Phytosanitary Measures (SPS).

Moreover, a seminar on the monitoring, phytosanitary measures and management of the tomato borer Tuta absoluta was delivered during the workshop. Thirty participants from Bahrain, Qatar, UAE and Yemen attended the workshop as well as the field visit to a national company applied the ISPM 15.

Regional Symposium on the Management of Fruit Flies in Near East Countries, Tunisia, 6-8 Nov, 2012

The FAO is pleased to announce the organization of a Regional Symposium on the Management of Fruit Flies in the Near East and North Africa Region. The symposium will be organized jointly with IAEA, NEPPO, the General Directorate of Plant Protection in Tunisia and the Tunisian Association of Plant Protection. The symposium will be held in Tunisia, during 6-8 November 2012.

The Symposium is intended to address all aspects of the fruit flies management: distribution, biology, damage, phytosanitary measures, management strategies, etc.

The aim of the symposium is to provide a common forum for researchers, regulatory authorities, experts from extension services or advisory bodies and the crop protection industry to share their knowledge on fruit flies management and to identify the gaps in knowledge and research in the region.

The symposium will be convened through the plenary lecture sessions, discussion sessions and a poster session with a field trip.

For more information, please contact Dr. Khaled Al Rouechdi (Khaled.alrouechdi@fao.org) and/or Dr. Nasraoui Bouzid (nasraoui.bouzid@iresa.agrinet.tn).

Professional Vacancy Announcement for Plant Production and Protection Officer at the FAO

***Position Title*:** Plant Production and Protection Officer
***Organizational Unit*:** Subregional Office for Northern Africa (SNE)
***Grade Level*:** P-3
***Duty Station*: Tunis, Tunisia**
***Duration*:** Fixed Term: 3 years
Minimum Requirements:
Candidates should meet the following:

- Advanced University Degree in one of the following: Crop production and/or protection, Plant Sciences or a closely related field
- Five years of relevant experience in plant production and/or protection including experience in the Northern Africa region
- Working knowledge of French and English

*Knowledge of Arabic would be an asset
Deadline For Application: 02 October 2012
For more information and procedures for the application, please have a look at the original text of the announcement in both French and English languages at the following links to the FAO website:
English URL:
http://www.fao.org/fileadmin/user_upload/VA/pdf/IRC2113_e.pdf
French URL:
http://www.fao.org/fileadmin/user_upload/VA/pdf/IRC2113_f.pdf

❖Short plant protection notes

- IPM implementation for tomatoes in SPAIN is reported to have helped reduce pesticide use 55 percent, partly attributable to reduced fungicide application due to favorable climate: less rainfall and a warmer than usual winter. S.B. Slot, Sander@freshplaza.com .
- Weed control is a critical element for Melon yellow spot virus management as weeds provide habitat for the vector thrips as well as serve as an initial inoculum source for the virus. S. Yamasaki, Yamasaki-Shuichi@pref.oita.lg.jp .
- A product based on spinosad provided acceptable control of *Microtheca ochroloma* (yellow margined leaf beetle) in organic crucifer production. H.Y.Fadamiro, FadamHY@auburn.edu .
- Fructose related leaf surface chemicales can influence *Cydia pomonella* (codling moth) host selection implicating new approaches for insect resistance in plantbreeding particularly of *Malus domestica* (apple). S. Derridj, Sylvie.Derridj@gmail.com .
- Introduction of large areas of biofuel crops into an agro-ecosystem is likely to alter crop pest and natural enemy demographics. B. McCornack, McCornack@ksu.edu .

❖GENERAL NEWS

A POTATO LATE BLIGHT NETWORK FOR EUROPE

A potato late blight network for Europe supports the EuroBlight web page www.euroblight.net containing extensive information related to the involved pathogens, their management, as well as links to the nearly 40 institutions participating in the effort. The most recent scored comparison of 21 fungicidal compounds published on the EuroBlight page is dated January 2012. The site includes a table of field tests for foliage resistance to blight as well as articles, posters, workshop proceedings, and other materials .

BRITISH CROP PRODUCTION COUNCIL

BCPC (British Crop Production Council) has launched a newly designed **UK Pesticide Guide Online** as a means of providing more current information to users, according to a press release. The revised database offers information about more than 1,300 pesticides and adjuvants used in the UK. The online version has the advantage of showing periodic updates that occur during the period before a revised hard copy version becomes available. Among the included features are: mode of action codes; hazard categories; product fact sheets and harvest intervals. All subscribers to the online guide gain free access to BCPC's Identipest pictorial diagnostic tool identifying insect pests, weeds, and diseases in 34 UK field crops. C. Todd, BCPC, 7 Omni Business Ctr., Omega Park, Alton, Hampshire. GU34 2QD, UK. md@bcpc.org

THE EUROPEAN AND MEDITERRANEAN PLANT PROTECTION ORGANIZATION (EPPO)

The European and Mediterranean Plant Protection Organization (EPPO) has developed a prioritization process for all known or potentially **invasive alien plant species** in the EPPO region. The resulting information is cataloged on four individual lists that can all be freely accessed at www.eppo.int/INVASIVE_PLANTS/ias_lists.htm. Plants are listed by their scientific nomenclature. There are 43 species on the invasive list currently. In addition, EPPO maintains an observation list, an alert list, and a recommended for regulation list.

GLOBAL BIOPESTICIDES MARKET – TRENDS & FORECASTS (2012 – 2017)

Confirmation that the global market for biopesticides is burgeoning comes in the form of a June 2012 report, Global Biopesticides Market - Trends and Forecasts (2012-2017), published by Markets and Markets. Several factors account for the growth including phase out of older, less benign pesticides, and increasing market demand for residue-free crop protection products. The report analyzes trends, opportunities, and current issues and also presents monetary projections. See: http://tinyurl.com/bpn692l.

❖ Arab Society for Plant Protection News

11TH ARAB CONGRESS OF PLANT PROTECTION, 2013, TUNISIA

The Executive Committee of the Arab Society of Plant Protection received a kind invitation from the Tunisian Ministry of Agriculture to host the 11th Arab Congress of Plant protection in Tunisia during the fall of 2013. It is hoped that the first announcement for the 11th ACPP will be circulated by the congress organizing committee in the near future.

❖ Publications

NEW BOOKS

Principles of Insects Taxonomy

Editor: Mohammad Fouad Tawfik,

The book starts with explanation of what is the taxonomical science of animal, definition of some scientific terms associated with it and history of this science. Then brief and important information of collecting specialized collection groups and taxonomical categories, with an explanation of each category separately, with reference to the scientific names of the high categories in insect class to the level of the family has come. Also, it provides a good presentation to the process of taxonomy, beginning with collection of insects, preparation of insect groups, importance of these groups and means of discrimination of species and lower categories, with reference to individual variations in a species and how to identify them, with an explanation of taxonomical characteristics that reliable in the field of qualitative discrimination. A brief presentation of quantitative methods in taxonomy and statistical analysis of variances among the groups came next. It followed by a presentation of the results of taxonomical studies in terms of description, different specimens of taxonomical keys, with reference to the evolutionary history of organisms and how to prepare a scientific paper for publication in taxonomy. For the importance of the scientific binomial nomenclature of organisms in the field of the science of taxonomy, an accurate translation of the international laws of binomial nomenclature for their critical importance has been provided. (267 pages)

Insects and Environment

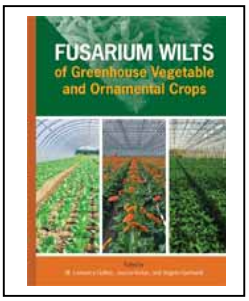
Editor: Mohammad Fouad Tawfik.

Chapter I started with the history of presence of insects on the plant and with an overview of the role of this planet. It focused in chapter II on external influences on insects by explaining their sensory receptors that controlled their activities, including attraction towards the circumstances that surround them, means of protection from natural enemies and competition among the species. Chapter III focused on an explanation of the insect life on earth to live a free life, or collectively, or solitary. Chapter IV directed to talk about insects and their relationship to the ecosystem, with an explanation of the natural balance between organisms and environment, processes responsible for changing the size of insect populations, conditions which are paid to these organisms as pests, impact of weather and finally their relationship to biological diversity on earth. Chapter V concerned with role of insects on plants. Then it began to talk about agriculture and agricultural pests, insect-eating plants, beneficial insects, including natural enemies of pests, flower pollinators and insects eat grasses. Chapter VI presents the facts about insects and started with a talk about characteristics of the medium of underground, insects live in this medium. Chapter VII provided a description of insects in the aquatic medium to complete the talk about these organisms in different ecological media. It was necessary to introduce in chapter XIII, position of the insects harmful to human and animal health by mentioning their groups, performance as vectors of diseases or parasites and how to protect themselves from their harmful and the philosophy of their presence in the environment. Chapter IX described the insect, as products of useful materials to man, such as honey bees and bee gum, bee venom, silk and other materials. Chapter X refers to insects and their relationship to science and arts presenting. Finally, the XI chapter indicated the concept of combating insect pests' environmental perspective. (392 pages).

Fusarium Wilts of Greenhouse Vegetable and Ornamental Crops

Edited by M. Lodovica Gullino, Jaacov Katan, and Angelo Garibaldi

$169.00 Price



This book not only reflects current thinking on the topic of fusarium wilts, but considers them in the context of the greenhouse an agricultural setting that is increasingly prevalent, particularly for certain crops. Fusarium wilts have always presented a challenge to greenhouse growers of vegetable and ornamental crops. The crops in this category are economically important and environmentally significant and their care is vital to our world economy and food supply. An update of this topic is long overdue and editors Lodiovica Gullino, Katan, and Garibaldi have led this effort to bring together their fellow leading scientists for a worldwide perspective as reflected by both the international assortment of chapter authors and the research cited.

The book begins with a current review of the genus ***Fusarium***, its biology and epidemiology, genetics, and diagnosis. This includes coverage of improved diagnostic tools that permit better discrimination of the **formae speciales**, a crucial advance that is vital in this century long battle with ***Fusarium***.

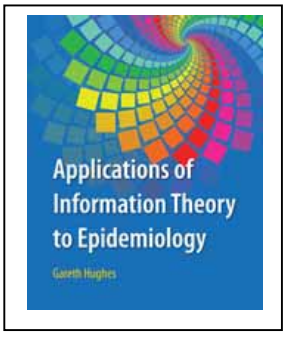
Management strategies, cultural practices, and genetic approaches for either preventing or containing the disease are covered in depth and provide an integrated arsenal of tactics from breeding for resistance, to irrigation, to chemical controls. The case studies in the book provide specific discussions of key greenhouse crops giving the reader applied knowledge for diagnostic and prevention strategies by crop or crop type. Greenhouse growers and those that advise them will gain valuable insight to put into practice right away.

Anyone studying the impact of fusarium wilts will consider this book a major addition to the scientific knowledge on the topic. This text provides a very complete overview of fusarium wilt diseases and many of the most important hosts afflicted by them. The book will be a core resource for students, researchers, and extension professionals worldwide

Application of Information Theory to Epidemiology

Gareth Hughes

$119.00 Price



This book provides a new tool in diagnostic decision making by joining applications of information theory to plant disease epidemiology.

In **Applications of Information Theory to Epidemiology**, author Gareth Hughes gathers together epidemiological applications of information theory and presents them in a manner that makes them accessible to plant disease epidemiologists and others in the field of plant pathology and beyond. He provides a summary of basic concepts, methods, and results that is not only understandable to newcomers to the topic, but is immediately useful and applicable for those using data for making diagnostic determinations.

This is the first book written on information theory applications explicitly for plant disease epidemiology. Few, if any, plant disease epidemiologists have followed closely the epidemiological applications of information theory. One reason for this is that applications of information theory to epidemiology have been devised almost exclusively by clinical epidemiologists. The author's key methodologies related to diagnostic decision making as it relates to plant diseases are drawn from his career work which includes the epidemiology and modeling of diseases. Dr. Hughes has been honored for his work using real-world disease problems in fruit crops as model systems for the development of methodology for basic research in epidemiology and plant disease losses. The breakthrough results of these basic studies have provided new innovative approaches for the management of diseases and have made a substantial impact on our knowledge in this area of science.

Application of Information Theory to Epidemiology uses original clinical epidemiology examples as well as phytopathological applications to illustrate theory, citing a wide range of literature. This permits the examples in the book to be used by many diverse groups of scientists. This book is ideally suited for plant pathologists and others with an interest in the quantitative basis for diagnostic decision making. Epidemiologists (botanical, also clinical and veterinary) will find it useful as well. Those who have enjoyed Larry Madden's **The Study of Plant Disease Epidemics** will welcome this title as a continuation of the applied knowledge in this area. The author includes a helpful glossary of terms for those new to the nomenclature.

SELECTED RESEARCH PAPERS

CONTENTS OF ARAB JOURNAL OF PLANT PROTECTION, VOLUME 30, ISSUE 1, JUNE 2012

Determination of Anastomosis Groups within Population of *Rhizoctonia solani* Kuhn in Potato in Syria. 2012. R.H. Abdo, B. Bayaa and A. Abbas (Syria). Arab Journal of Plant Protection, 30(1): 1-9.

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EVENTS OF INTEREST

2012

*** 01-05 October 2012.**

IOBC/WPRS Pheromones and other Semiochemicals Conference, Bursa, Turkey. http://www20.uludag.edu.tr/~bitkik/iobc/iobc_pheromone_2012.html

*** 1–5 October**

10th Conference of the European Foundation for Plant Pathology (EFPP) "IPM2.0 Towards future-proof crop protection in Europe" in Wageningen, The Netherlands. See: www.efpp.net/Events.htm .

*** 07–10 October 2012.**

7th European Conference on Pesticides and Related Organic Micropollutants in the Environment & the 13th Symposium on Chemistry and Fate of Modern Pesticides in Porto, Portugal . http://pesticides2012.iaren.pt , E-mail: pesticides2012@iaren.pt

*** 16-19 October**

International Conference on Plant Resistance Sustainability at Institut National de la Recherche Agronomique, near Nice, France. Contact: contactPRS2012@sophia.inra.fr ; See: https://colloque4.inra.fr/prs2012

*** 25–26 October 2012.**

First International CSPP/IAPPS Symposium on New Management Strategies for Insects and Diseases of Rice. Beijing, China. More

information about the symposium will be shown on the CSPP website: http://www.ipmchina.net/cspp_2012/en/ or on the IAPPS website: http://www.plantprotection.org/

*** 25–27 October 2012.**

1st International MPU Workshop "Plant Protection for the Quality and Safety of the Mediterranean Diet" that will be held in Bari, Italy. http://mpu2012.ba.cnr.it/

*** 4-10 November**

3rd International Symposium on Biological Control of Plant Bacterial Diseases in Agadir, Morocco. Contact: e-mail: biocontrol2012@iavcha.ac.ma ; See: http://www.iavcha.ac.ma/biocontrol2012

*** 06–08 November 2012.**

Regional Symposium on the Management of Fruit Flies in the Near East and North Africa Region. Tunisia. please contact Dr. Khaled Al Rouechdi (Khaled.alrouechdi@fao.org) and/or Dr. Nasraoui Bouzid (nasraoui.bouzid@iresa.agrinet.tn).

*** 11-14 November 2012.**

Entomological Society of America, ESA's 60th Annual Meeting. Knoxville Tennessee. **USA.** For more details you may contact redpalmweevil@gmail.com

*** 12-13 November 2012.**

Cairo International Conference for Clean Pest Management. Cairo, Egypt For more details you may contact Prof. Dr. Ahmed Abdu Hamed Amin: aahakaa@yahoo.com

*** 18–23 November 2012.**

The International Citrus Congress. Valencia, Spain**.** http://www.citruscongress2012.org/

*** 19-21 November**

6th Meeting on Induced Resistance in Plants Against Pathogens in Vicosa, Minas Gerais State, Brazil. Contact: Professor Fabricio Rodrigues at: e-mail: fabricio@ufv.br

*** 19–22 November 2012.**

1st International Symposium on Horticultural Insects Management (ISHIM). Amman – Jordan . http://www.cardne.org

2013

*** 20-23 January**

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

*** 28 January-1 February**

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

*** 18-22 February**

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

*** 22-26 April**

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

*** 28 July–2 August**

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

*** 25-30 August**

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

*** 24-27 November**

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

2014

*** 13-18 July**

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

*** 27 July-1 August**

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

*** 03-08 August**

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

*** 09-13 August**

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

*** 17–24 August**

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

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