

XVI International Plant Protection Congress



Congress Proceedings

Volume 1

15 - 18 October 2007 Scottish Exhibition & Conference Centre, Glasgow, Scotland, UK



| CONTENTS | | Page |
|--|---------|----------------------------|
| The XVI IPPC Programme Committee The XVI IPPC Organising Committee The IAPPS International Advisory Committee Author Index Abbreviations | | XXXVII XXXVIII XXXIX |
| VOLUME 1 | | |
| Session 1 Responsibilities and Challenges of Modern Crop Protection | Session | Page |
| The future is agriculture and crop science will help C Verschueren | 1-1 | 2 |
| How safe is our food? Whom do you trust? A R Hardy | 1-2 | 8 |
| Farming at the sharp end with a blunt instrument S M Browne | 1-3 | 20 |
| Session 2A New Compounds, New Concepts, New Uses and New Approaches 1 | | |
| Orysastrobin: critical design features for a rice fungicide T Grote, J Dietz, E Haden, A Johansson and S Strathmann | 2A-1 | 26 |
| Meptyldinocap: a new active substance for control of powdery mildew A E Hufnagl, B Distler, L Bacci and P Valverde | 2A-2 | 32 |
| Biological properties of the carboxamide boscalid including recent studies on its mode of action G Stammler, H D Brix, A Glättli, M Semar and U Schoefl | 2A-3 | 40 |
| Cyflumetofen: a novel selective acaricide Y Sasama, N Takahashi, N Ishii, N Hayashi et al | 2A-4 . | 46 |
| Chlorantraniliprole: a novel anthranilic diamide insecticide A Bassi, R Alber, J A Wiles, J L Rison et al. | 2A-5 | 52 |
| Spirotetramat, an innovative fully systemic insecticide for sucking insect pest control in agriculture: biological profile and field performance X van Waetermeulen, E Brück, A Elbert, R Fischer et al. | 2A-6 . | 60 |
| Spinetoram (XDE-175): a new spinosyn A Chloridis, P Downard, J E Dripps, K Kaneshi et al. | 2A-7 . | 68 |
| Metaflumizone, a new broad-spectrum insecticide for crop protection | 2A-8 | 74 |

| Mesotrione to control triazine - and ALS-resistant <i>Amaranthus</i> in grain sorghum D L Regehr and G L Cramer |
|---|
| New uses for old chemistry – chlorpyrifos-methyl for the control of pyrethroid resistant <i>Meligethes</i> (pollen beetle) in oilseed rape C Longhurst, M Miles, J Fraser, V Jacquet and A Zotz |
| IKR-001: a novel repellent product effective on whiteflies Y Arimoto and T Kashima |
| Coumarin derivatives as novel plant protectants N L Brooker, E Bluml, J Laas and R Pavlis |
| Total synthesis of (\pm) -rocaglamide and its analogue Z Qin, H Li, B Fu, M Wang et al |
| Spirotetramat - discovery, chemistry and physicochemical properties R Fischer, T Himmler, R Nauen, U Reckmann and W Schmitt |
| Session 2B Crop Protection Practice: Formulas for Success |
| Success through knowledge in crop protection G Marshall |
| Managing more sustainable agro-ecosystems using mustards and mustard by-products D C Thill, M J Morra, J Johnson-Maynard, J P McCaffrey and L D Makus 2B-2 108 |
| Empowering small farmers in Kenya to improve maize productivity through the promotion of farm inputs and efficient management P D Seward |
| A Canadian perspective on herbicide-resistant crops C Swanton and R H Gulden |
| Session 2C Organic Production |
| Plant protection in organic agriculture: a systems approach for above-ground disease management M R Finckh |
| Promoting plant health through organic systems: soil health and root disease suppression A H C van Bruggen, W J Blok and A M Semenov |
| Weed community dynamics in mixed ley-arable organic rotations N McRoberts, C Watson and G Squire |

| Diversity in arable systems for production stability H Jones, S Clarke, Z Hinchsliffe and M Wolfe |
|---|
| Effects of <i>Phytophthora infestans</i> on potato yield in organic farming as influenced by nutrient status F Hayer, J Benz, M R Finckh, E Schulte-Geldermann and C Bruns |
| Impact of farming practices on stem-base diseases of wheat P Matusinsky, R Mikolasova and T Spitzer |
| Weed management in organic cereals by the use of legume intercrops and over-winter green manures J A Baddeley and R L Walker |
| Does farm worker health differ between conventional and organic horticultural systems? P A Cross, G Edwards-Jones and R T Edwards |
| Session 2D Viruses, Phytoplasmas and their Transmission |
| Control of phytoplasma vectors P G Weintraub |
| A secreted effector protein of AY-WB phytoplasma accumulates in nuclei and alters gene expression in host plant cells S A Hogenhout, X Bai, V R Correa, T Y Toruño et al |
| Are phytoplasmas transmitted through seed? M J Dickinson, J O Nipah and J Hodgetts |
| Emerging virus and viroid diseases – new threats and novel methods R A Mumford |
| Development of antibody-mediated resistance against Tomato Yellow Leaf Curl Virus M R Safarnejad, R Fischer and U Commandeur |
| Biological and molecular characterization of Lettuce Mosaic Virus from Iran P Soleimani and S H Goudarzi |
| Occurrence and distribution of Bean Yellow Mosaic Virus in faba bean and <i>Gladiolus</i> fields of different provinces of Iran B Rohani, M Kouhi Habibi, G Mosahebi, N Hamzeh and K Ghazanfari P2D-7 146 |
| Use of the polymerase chain reaction for molecular analysis of <i>Potato leafroll</i> virus isolates in Tehran, Iran K Hemmati Ahouee, M Kouhi Habibi and G H Mosahebi |
| Location and identification of soil-borne viruses of sugar beet in Poland N. Borodynko and W. Wiśniewski. P2D-9 150 |

| Characterization of a tymovirus causing disease in diascia ornamental plants A T Segwagwe and K C Eastwell | P2D-10 152 |
|--|------------|
| Session 3A Sociological and Ethical Issues Associated with Crop Protection An International Perspective | |
| Sociological and ethical issues associated with crop protection: an overview D Atkinson | 3A-1 156 |
| Sociological and ethical issues associated with crop protection in Austria: consumers prefer organic and GMO-free foodstuffs B Kromp and L Maurer | 3A-2 158 |
| Public perception and technological approaches to crop protection in the south-eastern USA K L Korth, E J Wailes, J R Clark and J C Correll | 3A-3 160 |
| Genetically Modified Organisms in Bulgarian agriculture S Ivanov, V Alexieva and M A Hall | 3A-4 162 |
| AG-Biotech from an Argentine perspective: a 'soybean republic' or a bet to the future? H E Hopp | 3A-5 164 |
| How are opinions about GMOs changing over time? The case in the EU and the USA S Bonny | 3A-6 166 |
| Session 3B Crops for Biofuel and Bioenergy | |
| The bio-based economy – plant protection considerations with expanding non-food cropping D B Turley | 3B-1 170 |
| Crop rotation systems for sustainable energy farming K Gödeke, A Nehring and A Vetter | |
| Identifying and addressing the challenges of oilseed rape cultivation for biodiesel production E J Booth, S J P Oxley and J Bell | 3B-3 174 |
| Grass and woody biomass species – agronomic requirements learnt from 15 years field experimentation A Riche A Karp M Pei J Shield and N Yates | 3B-4 176 |

| The impact of crop management on life cycle analysis for biofuels L Hodsman, A Hamer and N D Mortimer |
|--|
| Session 3C Advances in the Diagnosis and Forecasting of Plant Diseases |
| Developments in forecasting models for integrated disease control V Rossi |
| A web-based information system for plant disease forecasting based on weather and soil data at high spatial resolution W S Kang, K S Do, E W Park and Y K Han |
| Detection of pathogens in plants: new technologies for old challenges P Karlovsky |
| Taking molecular diagnostics into the field – the PortCheck experience N Boonham, R Mumford, J Tomlinson, B van de Vossenberg et al |
| Detection and quantification of the potato cyst nematodes Globodera rostochiensis and G. pallida V C Blok, A Paterson, J Heilbronn, A Holt et al |
| A forecasting model for the initial incidence of citrus scab disease (<i>Elsinoe fawcettii</i>) on spring flushes J W Hyun, H M Kwon, H C Lim and D S Kim |
| PearScab: software for forecasting pear scab development on a real-time basis W S Kang, E W Park and Y K Han |
| Use of data from a disease management service to develop protocols for disease forecasting and management in mushroom production A D Clift and A Shamshad |
| Forecasting of meadow moth (<i>Loxostege sticticalis</i> L., Pyralidae, Lepidoptera) in China Y Sun, Y Gao, Z Lu and Y Su |
| The canopy hyper-spectrum character of maize damaged by Curvularia lunata (Wakker) Boed, and yield loss estimation L Wen, Y Zhang and J Shi |
| Molecular identification of the most common fungi associated with grapevine decline in Castilla y León (Spain) R Cobos and M T Martin |
| Detection of <i>Ralstonia solanacearum</i> from soil and water samples by the enrichment PCR method J-F Wang and C H Lin |

Session 4A The Debate This House Believes that Rachel Carson would not today have written Silent Spring An overview of the issues for debate To propose the motion To oppose the motion To second the proposition To second the opposition Session 4B Formulation and Application Technology for the Future Application technology – future trends and directions An overview of recent investigations into potential bystander exposure to pesticides Aerial granule application of flutriafol for soybean rust control New spraying technologies for locust control in Central Asia: MiGs vs Micronairs Performance of ground spraying for soybean rust control Effect of nozzle type and spray angle on the control of Fusarium Head Blight of wheat A R J Johnson and M C Hare...... P4B-6 230 Reduced agent and area treatments (RAATs) of rangeland grasshopper infestations using ultra-low insecticide dose rates and kairomonal attractants The implications for efficacy of adopting air induction

nozzles in cereal production

| Prototype to improve the quality of phytosanitary products application in a trellised vineyard A Porras-Soriano, I Marcilla-Goldaracena, M L Soriano-Martín and A P Orras-Piedra |
|--|
| Using uniform design and partial least-squares regression to prepare hypertonic emulsifiable concentrate W Fang-lin, L Shao-nan, W Hui-ming and Z Guo-nian |
| Session 4C Mycotoxins – A Food Safety Issue |
| Mycotoxin legislation applicable to UK agriculture S Origgi |
| Impact of agronomy on the fusarium mycotoxin content of wheat S G Edwards |
| Prevention of ochratoxin A in cereals P Johnsson and M Olsen |
| Session 5A New Compounds, New Concepts, New Uses and New Approaches 2 |
| Genetic technologies to enhance the Sterile Insect Technique A M Kramer and L S Alphey |
| Modern petroleum spray oils: do they kill insects by asphyxiation? Evidence for an alternative mode of action A J Najar-Rodriguez, G H Walter and R K Mensah |
| A novel microencapsulated formulation of pyrethrins to control resistant pests A C Khot, L M Field, G D Moores and R V Gunning |
| A summary of six years of greenhouse, microplot and field experimentation with a new in furrow, at-planting material for the management of plant parasitic nematodes of major agricultural crops in the southern United States |
| E C McGawley |
| R A Carvalho |
| Characterization of a novel carbendazim tolerant <i>Bacillus subtilis</i> strain with multiple plant growth promoting activities C K Shirkot and I Vohra |
| Bacillus subtilis, strain QST713 bio-fungicide: pre harvest applications for post-harvest disease control in fruit crops D Edgecomb, D Manker, M Seiler and P Walgenbach |

Session 5B

Beyond 91/414 – What Will the New Regulation Mean in Practice?

| The Commission perspective on the new Regulation L Törnqvist |
|--|
| A Member State view on the new Council regulation intended to replace Directive 91/414/EC P J Chapman |
| Beyond 91/414 – what will the new regulation mean in practice? The challenge to industry and the impact on innovation. E W Jones |
| The impact of European pesticide regulation on product availability for crops C M Knott |
| Session 5C Changes in Land Use |
| Changing policies for land use M F Askew |
| Land use after CAP reform J S Marsh 5C-2 296 |
| Future land use and the provision of public goods M I Avery |
| Global biofuels production trends and impacts on cropland use R Wisner |
| RELU – Biomass: social, environmental and economic implications of increased rural land use under energy crops A Karp, A Riche, I Shield, A Houghton et al |
| Post-graduate Student Posters |
| Aphid density influences oviposition behaviour and larval performance in predatory hoverfly R Almohamad, F Verheggen, F Francis and E Haubruge |
| Oviposition preference of oriental fruit moth [Grapholita molesta (Busck), Lepidoptera: Tortricidae] for apple cultivars N K Joshi, L A Hull, G Krawczyk, E G Rajotte and C T Myers |
| Population dynamics of the citrus leafminer, <i>Phyllocnistis citrella</i> (Lepidoptera: Gracillariidae), and its natural enemies in the south and north of Iran |
| S Mohammadi and A A Seraj PPG-3 310 |

| Predacious mites for control of citrus thrips, Scirtothrips citri (Thysanoptera: Thripidae) in nursery citrus L Akbari and A A Seraj |
|---|
| Analysis of plant lectins to protect against different pest insects and identification of receptor(s) in the insect midgut A Sadeghi, E J M Van Damme and G Smagghe |
| Assessment of ecotoxicity of a mixture of the herbicides imazapic and imazapyr over the earthworm <i>Amynthas gracilis</i> (Kinberg, 1867), Megascolecidae, in laboratory conditions S M Alessandrini, R A Gimenez and A B Della Penna |
| Potential reduction of growth regulator inputs by exploiting the leaf growth response to alkaline pH in oilseed rape (<i>Brassica napus</i> L.) A K S Aronsson, P S Kettlewell, I G Grove and J P H Reade |
| Plant growth promoting rhizobacteria (PGPR) applied to biological control and to improve sugar beet, pumpkin and tomato crops production G Sacristán Pérez-Minayo, J I Reguera-Useros and D J López-Robles PPG-8 |
| Genetic structure of the Swedish population of <i>Phaeosphaeria nodorum</i> E Blixt, Å Olson, N Högberg, A Djurle and J Yuen |
| Quantitative resistance of tomatoes (<i>Lycopersicon ssp.</i>) against <i>Phytophthora infestans</i> AF Butz and M R Finckh |
| Effects of wetness and temperature on maturation of Leptosphaeria maculans and L. biglobosa ascospores in pseudothecia on oilseed rape debris Z Liu, B D L Fitt, A O Latunde-Dada and A M Hall |
| Nonlinear regression analysis to determine infection models of Colletotrichum acutatum causing anthracnose of red pepper using logistic equation W S Kang, E W Park and S C Yun |
| Genetic variation in inducibility of resistance in tomatoes against <i>Phytophthora infestans</i> K Sharma and M R Finckh |
| Phytotoxic effect of Artemisia aucheri on germination and growth of Amarantus retroflexus H S Zadeh, K Steppe and P Van Damme |
| Evaluating the role of cytochrome P450s in pyrethroid resistance of the diamondback moth, <i>Plutella xylostella</i> (L.) M A M Bautista, K Miura, T Miyata and T Tanaka |
| Residual fate and metabolism of oxadiargyl in paddy N Sanyal and A Chowdhury |

| Sexual fertility and vegetative compatibility of Fusarium verticillioides from maize in Iran A M Gohari, M Javan-Nikkhah, G A Hedjaroude, M Abbasi and V Rahjoo |
|--|
| Growth, yield and yield components of maize (<i>Zea mays</i> L.) as affected by density and the time of redroot pigweed (<i>Amaranthus retroflexus</i> L.) emergence M AghaAlikhani, S A M Modarres Sanavy, S Soufizadeh and F Etemadi |
| CGIAR/SP-IPM Symposium Emerging Themes in Agroecosystem Health and Food Safety |
| IPM contributions to the achievement of Millennium Development Goals of halving hunger and poverty B James, P Bramel, A Lagnaoui, E Erisgen and C Asiabaka |
| Importance of soil health to sustainability of staple crop production systems A Yahyaoui, J M Nicol, D Coyne, S Kelemu and K Makkouk |
| The underground revolution: importance of soil borne pathogens in marginal cereal production systems of West Asia and North Africa J M Nicol, A Yahyaoui, H Eleckcioglu, N Bolat et al |
| Occurrence, distribution and research situation of cereal cyst nematode in China D Peng, D Zhang, J M Nicol, S Chen, et al |
| The health and capacity of vegetative seed systems in sub-Saharan Africa: developing a pro-poor CGIAR strategy to harness new technologies and conserve biodiversity C Staver, R Markham, T Dubois, P Bramel et al |
| Putting agro-biodiversity to work: the cowpea story M Tamò, G Goergen, C Agboton and R Srinivasan |
| Functional agrobiodiversity in potato-based production systems - its monitoring and use J Kroschel, N Mujica, V Canedo and J Alcazar |
| Functional biodiversity for sustainable management of African rice gall midge in lowland rice-based systems F E Nwilene, O Ajayi, T A Agunbiade, O Youm et al |
| Potential changes in the distributions of the potato tuber moth, Phthorimaea operculella Zeller, in response to climate change by using a temperature-driven phenology model linked with geographic information systems (GIS) M Sporleder, J Kroschel and R Simon |

| Implication of climate changes on trans-boundary rust diseases A Yahyaoui, R P Singh, Z A Pretorius, M Hovmoller et al |
|---|
| Global monitoring of rust movement A Yahyaoui, D Hodson ,R Ward, K Cressman and E De-Pauw |
| Bio-safety of transgenic crops to non-target organisms H Sharma, M K Dhillon and M Tam |
| Consultative Group on International Agricultural Research (CGIAR) research-for-development agenda on mycotoxins for enhanced food safety and trade R Bandyopadhyay, A Menkir, S Asaad, T Ban et al |
| Designing more effective training in agro-ecological crop and pest management in bananas and plantains: an electronic learning resource C Staver and R Markham |
| Entertainment-education and pest management K L Heong, M M Escalada and N H Huan |
| VOLUME II |
| |
| Session 6A Meeting the Challenges Facing Arable Crop Protection at the Start of the 21st Century |
| |
| Meeting the Challenges Facing Arable Crop Protection at the Start of the 21st Century Crop protection in Europe at the crossroads: challenges facing European farmers |
| Meeting the Challenges Facing Arable Crop Protection at the Start of the 21st Century Crop protection in Europe at the crossroads: challenges facing European farmers P Kudsk |
| Meeting the Challenges Facing Arable Crop Protection at the Start of the 21st Century Crop protection in Europe at the crossroads: challenges facing European farmers P Kudsk |
| Meeting the Challenges Facing Arable Crop Protection at the Start of the 21st Century Crop protection in Europe at the crossroads: challenges facing European farmers P Kudsk 6A-1 376 Importance of pesticides in US crop production L P Gianessi 6A-2 378 Herbicide usage and associated problems in China C X Zhang, Y Liu, H L Cui, S H Wei and H J Huang 6A-3 380 Good Agricultural Practice (GAP) and Integrated Plant Protection (IPP): two instruments with the same tenor? |
| Meeting the Challenges Facing Arable Crop Protection at the Start of the 21st Century Crop protection in Europe at the crossroads: challenges facing European farmers P Kudsk |

| Effect of weed competition on RUE and leaf distribution of potato G H Noormohamadi, M R Haj Seyed Hadi, M Nassiri Mahallati, H Rahimian and E Zand |
|--|
| Potential of plastic barriers to control Andean potato weevil <i>Premnotrypes suturicallus</i> J Kroschel and J Alcazar |
| Developing a comprehensive management program for sudden death syndrome of soybean J P Bond, M E Schmidt, C M Vick, J H Klein et al |
| The pesticide environmental stewardship web site W G Buhler, R Gardner, J Wilson and C Ramsay |
| Session 6B Resistance to Crop Protection Agents Monitoring, Mechanisms and Management 1 |
| Resistance to neonicotinoids in Hemipteran pests K Gorman and I Denholm |
| Herbicide-resistant weeds, a threat to dryland farming B Rubin, O Hochberg, T Whitefish, G Ben-Ami et al |
| Resistance to acetolactate synthase (ALS) inhibiting herbicides in UK populations of the grass-weed <i>Alopecurus myosuroides</i> (black-grass) R Marshall and S R Moss |
| Molecular mechanisms associated with altered azole sensitivity in <i>Mycosphaerella graminicola</i> H Cools, T P Bean, J Motteram, S R Gilbert and B R Fraaije |
| The use of 'temporal synergism' to control insecticide-resistant crop pests G D Moores, D Philippou, L M Field, G Bingham and R V Gunning |
| The problem of noxious organisms resistant to pesticides applied to farm crops in Russia G I Sukhoruchenko, V I Dolzhenko, T A Makhankova, L D Grishechkina et al |
| Cymoxanil + mancozeb (1:8) 72% WP: a mixture to control downy mildew resistant to phenylamide fungicides W Wang, X Zhang, Z Ma, X Han and G Liu |
| Selection of insecticide resistance in <i>Trichogramma</i> spp. and biological characteristics of the resistant strains F Zhang, N Huang and H Wu |

| Methidathion resistance mechanisms in Amblyseius womersleyi Schicha M E Sato, T Tanaka, T Miyata, A Kawai and O Nakano |
|--|
| Session 6C Bioterrorism Identifying the Threats and Preventing Damage |
| Protecting natural and agricultural plant systems from bioterrorism and biocrime J P Stack |
| Can insects be bioterrorism agents? L G Higley and P M Higley |
| Limitations to the use of plant pathogens as agents of bioterrorism P M Higley and L G Higley |
| Bioterrorism: past, present and preparedness in plant protection J E Foster |
| New software to manage pest information for phytosanitary and safeguarding programmes K Suiter and R E Stinner |
| Session 6D Efficacy of Biological Control, Using Living Organisms and Natural Products Multitrophic Interactions |
| Complex multitrophic interactions in the plant environment can affect disease biocontrol J M Whipps |
| The <i>Epheli</i> s fungus, an epiphytic symbiont of C4-grasses, confers resistance against herbivorous pests and environmental stress T Tsukiboshi, R Uegaki, K Sugawara and S Yoshimatsu |
| An immunological axis of biological control: microbial infections in field-caught insects D W Stanley and H Tunaz |
| Effect of biocontrol activity on different plant species by Pseudomonas oryzihabitans and Xenorhabdus nematophila against Pythium damping-off A V Kapsalis, F T Gravanis and S R Gowen |
| The effect of previous rearing of <i>Trichogramma brassicae</i> on factitious hosts on its acceptance to target hosts G. Nouri-Ganbalani, N. Vaez, S. H. Iranipour and M. M. Jafarloo |

| Breeding and application of the natural enemy <i>Scleroderma</i> guanica to control pests of medicinal plants J Chen, H Cheng, J Yu, R Xu and S Chen |
|--|
| Utilization of green lacewing, <i>Mallada basalis</i> (Walker) (Neuroptera: Chrysopidae) for augmentative biological control of thrips in asparagus in Thailand O Kern-asa, W Suasa-ard and S Uraichuen |
| Utilization of larval parasite Cotesia flavipes for augmentative biological control of sugar cane moth borers in Thailand W Suasa-ard, K Suksen and O Kernasa |
| Production of <i>Bacillus thuringiensis</i> biopesticides using a commercial lab medium and agricultural by-products as nutrient sources F H Valicente, M I S Leite, F L Freire and C M Vieira |
| The use of plant essential oils for the control of pine wood nematode (<i>Bursaphelenchus xylophilus</i>) I K Park, J H Kim, S G Lee, Y S Lee and S C Shin |
| Isolation, identification and activity of insecticidal components from <i>Streptomyces</i> sp. 4138 B R Lin, X M Pu, H F Shen, M Y Hu et al |
| A systemic bioinsecticide containing azadirachtin for control of an invasive woodboring beetle, the emerald ash borer, <i>Agrilus plannipennis</i> B V Helson, D G Thompson, G W Otis, N G McKenzie and J Meating P6D-12 454 |
| Pasteuria penetrans as a commercial bio-nematicide I K Vagelas, S V Leontopoulos and F T Gravanis |
| Use of <i>Baculovirus</i> to control fall armyworm, <i>Spodoptera frugiperda</i> , in Brazil F H Valicente, E Tuelher, R C Pena, R Andreazza et al |
| Do growth media and temperature affect the activity of Beauveria bassiana as a biological control agent? A Olleka, S Ren and Q Hu |
| Elimination of Prunus necrotic ringspot and Arabis Mosaic Virus from rose plants by Stinging Nettle extract F Rakhshandehroo, A Modarresi and H R Zamani Zadeh |
| Fungitoxicity of <i>Inula helenium</i> extract against five pathogenic fungi W Q Wang, W Y Zhang, X F Zhang, X Y Han et <i>al.</i> |
| New <i>Bacillus</i> spp. strains isolated from natural sources or genetically modified with increased antimicrobial activities C M Voaides, C P Cornea, M Ciuca, R Tezel <i>et al.</i> |

| The association of differentially-expressed proteins with maize resistance to <i>Curvularia lunata</i> (Wakker) Boed in China J Chen, X Huang, L Liu, Y S Xu and Y Zhai | P6D-19 46 | 8 |
|--|-----------|------------|
| Effect of biocontrol on Fusarium wilt of cucumber and the influence of <i>Trichoderma atroviride</i> strain T23 on cucumber defence enzyme activities J Chen and J Zhuang | P6D-20 47 | '0 |
| Biopriming of sunflower seeds – a potential tool for increasing the efficacy of biological seed treatment for the management of Alternaria blight of sunflower M S L Rao, S Kulkarni, S Lingaraju and H L Nadaf | P6D-21 47 | '2 |
| Screening of pimaricin and pimaricin-like metabolites of Streptomyces natalensis for control of phytopathogenic fungi D Stephan and E Koch | P6D-22 47 | '4 |
| The extraction, purification and identification of the antifungal substance produced by <i>Streptomyces lydicus</i> AO2 W C Liu, J Y Qiu, T Liu, C G Lu <i>et al.</i> | P6D-23 47 | '6 |
| Verticillium nigrescens; a non-aggressive wilt pathogen as a promising biocontrol agent for Verticillium wilt of eggplant and cotton F T Gravanis, I K Vagelas and D G Natsiopoulos | P6D-24 47 | '8 |
| New <i>Pseudomonas</i> spp. strains with antimicrobial activities C P Cornea, C M Voaides, M Ciuca, I Grebenisan et al | P6D-25 48 | 30 |
| Screening rhizobacteria for the biological control of Fusarium oxysporum and Pythium ultimum root rot of sorghum A Idris, N Labuschagne and L Korsten | P6D-26 48 | 32 |
| Characterization of bacteriophages infecting <i>Xanthomonas</i> oryzae pv. oryzae to use as a biocontrol agent Y H Lee, H Y Chang, D H Lee, S Heu and D-S Ra | P6D-27 48 | 34 |
| Evaluation of non-chemical agents for control of black rot on grape vine (Guignardia bidwellii) in organic farming E Koch, D Molitor, B Berkelmann-Löhnertz and B Loskill | P6D-28 48 | 36 |
| Rice allelopathy and paddy weed management C H Kong | P6D-29 48 | 38 |
| Herbicidal activity of 2',3'-epoxyanisolactone and effect on metabolism of <i>Echinochloa crusgalli</i> L S Q Wan and H B Lu | P6D-30 49 | 9 0 |
| Phytotoxic effect of Artemisia aucheri on germination and growth of Amarantus retroflexus H.S. Zadeh, K. Steppe and P. Van Damme | P6D-31 49 | 92 |

| Use of fungal pathogens of chromolaena (<i>Chromolaena odorata</i> (L) K&R) for its biological control A Naseema, N S Saritha, A Safeena and K K Sulochana |
|---|
| Biological control of water hyacinth with a mycoherbicide A Naseema, M S Ancy and R Praveena |
| Allelochemicals derived from tropical plants and syntheses of their derivatives for plant protection T D Xuan and S Tawata |
| Comparison of different drying techniques for potential biocontrol agents I L Bisutti, D Stephan, A P Matos da Silva and R Nawrotzki |
| Micro-organisms to protect our crops and soils: a proposal to evaluate their environmental safety B J W G Mensink and J W A Scheepmaker |
| Session 7A Genetically Modified Crops: Successes and Problems |
| Genetically modified crops: successes and problems in the Midwest USA M D K Owen |
| Do herbicide-tolerant transgenic crops require less pesticide? The case of glyphosate-tolerant soybean S Bonny |
| The influence of herbicide resistant cropping systems on the soil environment in Canada C J Swanton, R Gulden, J Powell, M Hart et al |
| Evidence for regional suppression of European corn borer populations in transgenic Bt maize in the Midwestern USA: analysis of long-term time series data from three states |
| W D Hutchison, E C Burkness, R Moon, T Leslie et al |
| Session 7B Resistance to Crop Protection Agents Monitoring, Mechanisms and Management 2 |
| Acaride resistance in two-spotted spider mites, <i>Tetranychus urticae</i> T Van Leeuwen, L Tirry and R Nauen |

| The value of molecular-based technologies for detection of target-site resistance in weeds to ACCase and ALS inhibiting herbicides J Wagner, H Menne and B Laber | 0 |
|---|----|
| Pyrethroid resistance and its management in European populations of pollen beetles, <i>Meligethes aeneus</i> , in winter oilseed rape R Nauen | 2 |
| Piperonyl butoxide restores the efficacy of <i>Bacillus thuringiensis</i> toxin in transgenic cotton against resistant <i>Helicoverpa armigera</i> R V Gunning, V Borzatta, E Cottage, L M Field and G D Moores | 4 |
| Session 7C Biopharmaceuticals | |
| Production of recombinant biopharmaceuticals in plants – a potential solution for global health J K-C Ma | 28 |
| Challenges and opportunities of plant derived biopharmaceuticals R Fischer | Ю |
| Biopharming in plants: science, regulation and commercialisation J M Dunwell | 2 |
| Generating novel phytochemicals through biocatalysis R Edwards and O D Cunningham | 4 |
| The production of very long chain fatty acids in transgenic plants J A Napier, O Sayanova, R Haslam and M Venegas-Caleron | 6 |
| Session 7D Efficacy of Biological Control, Using Living Organisms and Natural Products Effective Biocontrol/socioeconomic Benefit | |
| Socio-economic benefits of some classical biological control projects in Africa P Neuenschwander | 0. |
| Socio-economic implications of cashew nut shell liquid and cypermethrin in protecting cowpea, <i>Vigna unguiculata</i> (L.) Walpers against field insect pests O F Olotuah | 2 |
| Evaluation of the efficacy of an indigenous Peruvian entomopathogenic nematode <i>Heterorhabditis</i> sp. to control the Andean potato weevil <i>Premnotrypes suturicallus</i> Kuschel under field conditions | |
| J Alcazar, J Kroschel and H Kaya 7D-3 54 | 4 |

| Brassica carinata as a biofumigant to control Phytophthora spp. in strawberry fields C Zurera, E Romero, M Porras, C Barrau and F Romero |
|--|
| Session 8A Invasive Alien Species Risk Analysis 1 |
| New methods for analysing risks to New Zealand of invasive alien species M D Ormsby |
| Can one predict the introduction, establishment and impact of invasive insects using species traits? M Kenis, S Bacher and A Zamany |
| Changes in a spider mite community after the introduction of the invasive pest <i>Tetranychus evansi</i> (Acari: Tetranychidae). F Ferragut, E Garzón-Luque and L A Escudero |
| Biological study of the coconut hispine beetle, <i>Brontispa longissima</i> Gestro (Coleoptera: Chrysomellidae) on coconut, Cocos nucufera L. and lesser bulrush, <i>Thypha angustifolia</i> L. leaves S Uraichuen, W Suasa-ard and K Suksen |
| EPPO activities for the risk analysis of invasive alien species F Petter and S Brunel |
| Identifying and reducing the risks posed by potato ring rot to the Scottish potato industry E Kerr and G S Saddler |
| Host preference of western flower thrips to ten vegetable seedlings in protected cultivation H Lu, Y J Gong and B C Shi |
| Seed testing preventing the introduction of invasive alien pathogens K J D Hughes, V L Barton, J Elphinstone and R Mumford |
| Pest risk analysis on the agent of bacterial blight of rice, Xanthomonas oryzae pv. Oryzae O M Martins and M R V de Oliveira |
| Some major invasive insects established on vegetables in North Carolina K A Sorensen |
| Session 8B Semiochemicals in Practice |
| Pheromones come of age E Casagrande |

| Current worldwide markets for biopesticides and success factors for the business R W J Harwood, M S K Lee, S G Lisansky and R Quinlan |
|--|
| Regulatory innovation and the biopesticide industry M S Whittaker |
| Induced resistance as a sustainable approach to plant disease control D R Walters |
| Session 9A Invasive Alien Species Risk Analysis 2 |
| Assessing and managing the distribution of risks posed by invasive alien species J D Mumford |
| Development of a Pest Risk Analysis for <i>Tilletia indica</i> , the cause of Karnal bunt of wheat C E Sansford |
| Management of an invasive alien species, the Mexican rice borer (Lepidoptera: Crambidae) on sugarcane and rice T E Reagan, J M Beuzelin, W Akbar, F P F Reay-Jones et al |
| The wheat curl mite, <i>Aceria tosichella</i> Keifer and associated viruses, Wheat Streak Mosaic Virus and High Plain Virus - the risks posed to cereal crops in South America D Navia, R S Mendonça, M F Batista, G Truol et al |
| Bio-economic modelling for optimal pest risk management: An application to <i>Diabrotica virgifera virgifera</i> in England L R Carrasco, J D Knight, J D Mumford, R Baker and A MacLeod |
| Session 9B Neonicotinoid Insecticides Present Status and Future Challenges |
| Nicotinic acetylcholine receptors as target sites for neonicotinoid insecticides N S Millar |
| Applied aspects of neonicotinoid uses A Elbert, M Haas, B Springer, W Thielert and R Nauen |
| Resistance to neonicotinoids in <i>Myzus persicae</i> in UK: good news, bad news and challenges ahead S.P. Foster 98-3 622 |

| Resistance management for the neonicotinoid insecticides: a coordinated agrochemical industry approach A R McCaffery and R Nauen | 9B-4 624 |
|---|-------------|
| Recent status of insecticide resistance of the rice planthoppers in East and Southeast Asia M Matsumura, H Takeuchi, M Satou, A Otuka et al. | |
| Variable efficacy of neonicotinoids against mealybug species under greenhouse conditions R D Oetting and M L Townsend | . P9B-6 628 |
| Session 9D Writing a Scientific Paper | |
| Writing a scientific paper A M Mortimer | 9D-1 632 |
| Submitting a scientific paper and responding to editors R E L Naylor | 9D-2 634 |
| SCI Symposium Closing the Yield Gap: Crop Protection for Poverty Alleviation | |
| Food security in Africa: public-private partnerships for closing the yield gap M Bokanga and E Terry | SCI-1 638 |
| Closing the yield gap: crop protection for poverty alleviation – can we help? Should we help? A Bennett | SCI-2 640 |
| How relevant is crop protection research to poverty alleviation? F Kimmins | SCI-3 642 |
| The benefits of rational pest control practices in Indian cotton D A Russell and K R Kranthi | SCI-4 644 |
| Semiochemicals – the future for crop health A Cork and P L Rau | SCI-5 646 |
| Biological pesticides for Africa: why has so little research led to new products to help Africa's poor? D. Grzywacz, A. J. Cherry and R. Gwynn | 001.0 |

| The protection of farmers' health is key to ensuring optimal agricultural production P M Ndumbe, A Same-Ekobo and P B Nkot |
|--|
| Weed management in Africa: experiences, challenges and opportunities D Chikoye, J Ellis-Jones, C Riches and L Kanyomeka |
| GM Crops – their role in less developed countries M Newell-McGloughlin |
| Emerging technologies for <i>Striga</i> control in Africa G Ejeta |
| Improving cocoa crop protection techniques for sustaining rural livelihoods in West Africa R P Bateman, M Gilmour and K P Hebbar |
| Challenge of improving cotton competitiveness in a distorted market: Analysing the role of crop protection in Francophone Africa M Fok, M Vaissayre and A Renou |
| The full potential of IPM and biological controls - training L Labuschagne |
| Reaching the poor? About mindsets, partnerships and methodological pluralism P Van Mele |
| Pesticides and poverty – analysing pesticide use context (PUC) to unleash the benefits without the backlash H M Dobson and K A Jones |
| Optimizing locust monitoring in Central Asia using remote sensing tools A V Latchininsky, R Sivanpillai and H Wilps |
| Closing the yield gap by education: plant protection by distance education J E Foster, C I Reimers-Hild and E A Heinrichs |
| Organic soil fertility amendments as a tool in integrated pest management in vegetable production in Uganda J Karungi, S Kyamanywa and B Ekbom |
| Cereal Cyst Nematode (<i>Heterodera avenae</i>) is causing damage on wheat in Henan: the bread basket of China L Hong-lian, Y Hongxia, W Xujin, Y Weixing and J M Nicol |
| Zooming-in, zooming-out: A new approach to scale up locally appropriate innovations of regional relevance P. Van Mele |

Session 10A

Developments in Crop Protection, Including IPM Strategies, in Modern Horticultural Crop Production Systems 1

| Trends in integrated pest management in the USA and Asia for vegetable production A M Shelton, C D Smart and A Rangarajan |
|--|
| IPM in horticultural crops in 21st century Europe R Meadow |
| Using plants to reduce pest insect populations in horticultural crops R H Collier |
| Area-wide pest management of fruit flies in Hawaii R F L Mau, R I Vargas, E B Jang, R M Faust and L Wong |
| Environment friendly methods to control olive fruit fly in Albanian organic olive orchards J Tedeschini, B Stamo and D Pfeiffer |
| Development and validation of IPM technology in cauliflower D B Ahuja, S K Singh, S Singh, H R Sardana et al |
| Grape vine moth in Albania S Shahini, S Varaku, E Kullaj,A Çakalli and Z Shahini |
| Toxicity of pesticides to the citrus leafminer and its parasitoid Ageniaspis citricola evaluated to assess their suitability for an IPM program in citrus nurseries A A Seraj and L Akbari |
| Bioefficacy and toxicity of some new and novel insecticides against some lepidopteran insect pest of vegetables M L Chatterjee and S Mondal |
| Population fluctuation of <i>Aphis craccivora</i> and <i>Liriomyza trifolii</i> and their endoparasitoids on certain faba bean varieties S M Abdel-Samad and M A Ahmed |
| Laboratory investigation of the biology of <i>Bactericera tremblayi</i> Wag. (Homoptera: Triozidae) a new pest in onion fields of Iran M H Kazemi and M Mashhadi Jafarloo |
| Session 10B Natural Resistance of Plants Arms Race or Balancing Selection? |
| Adaptive evolution of fungal avirulence genes imposed by resistance genes P J G M de Wit |

| Can information on the mode of pathogen attack be used to formulate novel crop protection stategies? J J Rudd, Hai-Chun Jing and K Hammond-Kosack |
|--|
| New strategies for deployment of plant resistance in cereals J D Burd, G J Puterka and D R Porter |
| The association of differentially expressed proteins with maize resistance to <i>Curvularia lunata</i> (Wakker) Boed in China J Chen, X Huang, L Liu, Y S Xu and Y Zhai |
| Virulence genes and population studies of <i>Magnaporthe grisea</i> in Fujian Province, China F R Chen, X J Yang, H C Ruan and Y X Du |
| Response of bird pepper (Capsicum frutescens L) genotypes to leaf curl virus K M A Khader, K Anandhi, K Umamaheshwaran and V Kumar |
| Screening of tea varieties for susceptibility to Lasiodiplodia theobromae by serological techniques and induction of resistance by botanicals A Saha, P Mandal, S Dasgupta and D Saha |
| Resistance to silverleaf whitefly, <i>Bemisia argentifolii</i> (Hemiptera: Aleyrodidae) in <i>Gossypium thurberi</i> , a wild cotton species E T Natwick and G P Walker |
| Searching for resistance sources against the Mexican bean weevil (<i>Zabrotes subfasciatus</i>) in common bean (<i>Phaseolus vulgaris</i>) genotypes E C Guzzo, O M B Corrêa, J D Vendramim, A F Chiorato et al |
| Development of defense gene expression monitoring systems by the bioluminescence reporter genes in higher plants K Hiratsuka, T Tanaka and S Ono |
| Bacterial acyl-homoserine lactones - signal molecules in quorum sensing and plant defense P Schröder, C Götz, A Hartmann, A Fekete et al |
| The variation and distribution of rice blast physiological race of in Jilin province X Guo, J Ren, X Liu, L Li and H Sun |
| Correlation between cyanogenic acid (HCN) content in cassava leaves and tolerance to anthracnosis caused by <i>Colletotrichum gloeosporioides</i> Z Ambang, N Bekol, J E Maho Yalen, J P Ngoh Dooh and M Bakak P10B-13 728 |
| Transgenic resistance to Heliothis/Helicoverpa: implications for sustainable crop production H C Sharma, G Pampapathy and M K Dhillon |

Session 10C

Tropical and Subtropical Crop Protection 1

| Integrated management practices for the control of important crop diseases in developing countries N A Phiri, D Karanja, M Kimani and N J Spence |
|--|
| Farmers' perception on plant health: The case of cassava in northern Malawi M Yajima, A Huis, J Jiggins, C Masangano and G Nyirenda |
| Eco-friendly management of nematodes in banana M S Sheela |
| Efficacy of bio-rational fungicides against sheathblight of rice under sub-tropical conditions S Saha, M Sarkar, D Konar and A Chowdhury |
| A physiological based model for processing cotton crop and pest management in middle Egypt A A Amin, M EI-Heley and K EI-Bahnasawe |
| Effect of pesticides on maize seed germination, emergence and control <i>Fusarium graminearum</i> V Govender, T Aveling and Q Kritzinger |
| Demographic parameters of silverleaf whitefly Bemisia argentifolii Bellows and Perring on cotton in Iran M A Samih |
| Evaluation of diversity of citrus bacterial canker by host range, rep-PCR and metabolic profiles Y H Lee, S Lee, D H Lee, H Y Chang et al |
| An organophosphate and a synthetic pyrethroid based product in management of coffee thrips (<i>Diarthrothrips coffeae</i>) in Kenya H M Mugo |
| Alternative control methods of the cochineal Dactylopius opuntiae in Northeastern Brazil R Carvalho and E Lopes |
| Root knot nematodes, <i>Meloidogyne</i> spp. A new threat to potatoes in Portugal I da Conceição, M Vieira dos Santos, A Gabriel, M da Cunha <i>et al.</i> P10C-11 754 |
| Session 10D Functional Diodiversity in Cropping Systems 1 |
| The conservation and utilisation of biodiversity in agro-ecosystems J Memmott |

| Drivers of biodiversity in the cropping systems of the Rolling Pampas C M Ghersa | 760 |
|--|-------------------|
| Functional impacts of biodiversity: indigenous mice and insects reduce weed population growth rates in low-external-input cropping systems M Liebman, A H Heggenstaller, B J Danielson and P R Westerman | 762 |
| Occurrence of mite species in tea plantations in Turkey S K Ozman-Sullivan, H Ocal and M Micik | <mark>76</mark> 4 |
| Analysis of biodiversity of soil micro-organisms associated with Sclerotium rolfsii sclerotium debilitation under flooded field conditions, using PCR-DGGE and sequence data A Adandonon, N Momma, Y T Hoshino, T Makino et al | 766 |
| The benefits of medicinal and aromatic plants rotations before tomato crops on biodiversity of soil fauna M A Rizk, M M Ghallab and W Z Mikhail | 768 |
| Session 11A Developments in Crop Protection, Including IPM Strategies, in Modern Horticultural Crop Production Systems 2 | |
| Assurance schemes: a route for research into practice? G M Tatchell | 772 |
| Status of IPM, pesticide use and misuse, and information transfer in horticultural crops in Albania, Ukraine and Moldova; participatory appraisal and baseline survey for tomato, cucumber, grape and apple D G Pfeiffer, J Tedeschini, S Shahini, B Stamo et al | 774 |
| Progress towards industry-wide sustainable IPM in Florida's strawberries J F Price | 776 |
| The overwintering chasmothecia of <i>Podosphaera aphanis</i> and the initiation of the subsequent epidemic A M Hall, J Dodgson and M Farooq | 778 |
| Differential effects of gibberellic acid on the growth of <i>Botrytis cinerea</i> isolated from various ornamental plants J A Martínez and S Bañón | 780 |
| Effect of <i>Phytophthora</i> spp. on the growth of tomato plants treated with <i>Pseudomonas oryzihabitans</i> A K Arseni, A V Kapsalis, F T Gravanis and S R Gowen | 782 |
| Apple: integrating pest and disease forecasting and management in India V S Thakur | 784 |

| Occurrence and management of root rot disease of <i>Panax notoginseng</i> in China S D Li; C Z Ma and Y J Chen |
|---|
| Session 11B Chemical Residues in Food |
| Review of the EU and NAFTA procedures for MRLs calculation J D Salazar |
| EFSA model for pesticide exposure assessment of temporary MRLs H K Reich |
| Acute dietary intake assessment of pesticide residues in fruit and vegetables B C Ossendorp |
| Cumulative exposure assessment – input data J Ruhl and A S Klemens |
| False positives in dithiocarbamate analysis: a review of the literature K L Hooke and C A Harris |
| Session 11C Tropical and Subtropical Crop Protection 2 |
| Applications of information technology in IPM in the developing world X Yulu, R Stinner and J Vankirk |
| Evaluation of different chemicals for weed control in wheat at different densities Z Hussain and K B Marwat |
| Possible effects of global warming on coffee disease in Kenya G M Kairu |
| Yield losses due to brown rust (<i>Puccinia melanocephala</i>) in sugarcane C A Hollier and J W Hoy |
| Session 11D Functional Biodiversity in Cropping Systems 2 |
| Wheat stripe rust and its prospects for ecological control in China W Chen, S C Xu, T G Liu, R M Lin et al |
| Targeted herbicide use in winter wheat for biodiversity benefits: is it a practical option? P J W Lutman, R I Hull, L Tatnell and J H Clarke |

| Impact of agricultural land management systems on soil microbial diversity and plant disease D O Chellemi and T Wu |
|---|
| Non-inversion tillage to conserve functional biodiversity for biocontrol of oilseed rape pests A W Ferguson, R Holdgate, N S Mason, S J Clark and I H Williams |
| Session 12B Post-harvest Biology and Storage Technology |
| Recent practical advances in post-harvest storage L A Terry |
| Chlorophyll fluorescence imaging as a tool to detect abiotic and biotic stresses in plants and to evaluate the physiological state of agricultural and horticultural products R L M Valcke |
| Sensor system for the detection of post-harvest spoilage of stored potato tubers P T N Spencer-Phillips, B P J de Lacy Costello, R J Ewen and N M Ratcliffe |
| Effect of nitrogen on bulb rot incidence in onion during storage R T Alberto, D T Eligio, S E Santiago and S A Miller |
| Control of post-harvest fruit rot in strawberry and apricot by <i>Metschnikowia pulcherrima</i> I Grebenisan, R Alexe, P C Cornea, C M Voaides <i>et al.</i> |
| Post-harvest tuber treatment with fenugreek seed and lufenuron as protectants against the potato tuber moth (Lepidoptera: Gelechiidae) G Saour |
| Protection of apple fruits from post-harvest spoilage by fungi A Sidawi, S Alchaabi and J Faddoul |
| Insecticidal properties of <i>Eugenia aromatica</i> against the pulse beetle <i>Callosobruchus maculatus</i> on cowpea seed O F Olotuah |
| Fungicide efficacy and residues in control of post-harvest spoilage of garlic O J You, Y H Lee, J B Kim, Y D Jin et al |
| Plant secondary metabolites for protection of stored pulse grain from the pest <i>Callosobruchus chinensis (L)</i> B K Salunkhe, K Prakash, K S Vishwakarma and V L Maheshwari P12B-10 840 |

Session 12C

Phytophthora ramorum and Related Pathogens

| The growing threat from invasive <i>Phytophthora</i> species: flaws in international biosecurity C M Brasier |
|--|
| Phytophthora ramorum – development of field and laboratory diagnostic strategies for effective disease management C R Lane, K J D Hughes, P A Beales, R J Weekes and N Boonham |
| Spatio-temporal analysis of <i>Phytophthora ramorum</i> cases in the UK X-M Xu, T Harwood, M Shaw, M Pautasso and M Jeger |
| Phytophthora kernoviae – a new emerging problem with special reference to ornamentals P M Giltrap and P A Beales |
| Evaluation of a rapid diagnostic field test kit for identification of <i>Phytophthora ramorum</i> , <i>P. kernoviae</i> and other <i>Phytophthora</i> species at the point of inspection C R Lane, E Hobden, L Laurenson, V C Barton <i>et al.</i> |
| Mating type of Belgian <i>Phytophthora ramorum</i> isolates A Vercauteren, I De Dobbelaere, K Heungens and M Maes |
| Session 12D |
| The Use of Beneficial Organisms in Plant Protection Population Level M anagement |
| The Use of Beneficial Organisms in Plant Protection |
| The Use of Beneficial Organisms in Plant Protection Population Level M anagement Pesticides and beneficial insects: rediscovering the origins and purpose of IPM |
| The Use of Beneficial Organisms in Plant Protection Population Level M anagement Pesticides and beneficial insects: rediscovering the origins and purpose of IPM P C Jepson |
| The Use of Beneficial Organisms in Plant Protection Population Level M anagement Pesticides and beneficial insects: rediscovering the origins and purpose of IPM P C Jepson |
| The Use of Beneficial Organisms in Plant Protection Population Level M anagement Pesticides and beneficial insects: rediscovering the origins and purpose of IPM P C Jepson |

| Purification and comparison of anti-feeding proteins | | |
|---|------------|----|
| between extracellular and intracellular protein of | | |
| Xenorhabdus nematophila var. Pekingensis | | |
| X F Yang, B J Yang, H W Yang, Z Liu et al | . P12D-7 8 | 70 |
| An In vitro study on biological potantion of some Iranian Trichoderma | | |
| isolates in control of soil borne plant pathogenic fungi | | |
| B Hajieghrari, M Torabi-Giglou and M Davari | . P12D-8 8 | 72 |