

# **THE 1998 BRIGHTON CONFERENCE**

**Pests & Diseases**

**Volume I**

# CONTENTS

Page

<b>The British Crop Protection Council Members</b> .....	XIX
<b>The British Crop Protection Council Objectives</b> .....	XX
<b>Programme Committee and Conference &amp; Symposia Co-ordinating Group</b> .....	XXI
<b>Abbreviations</b> .....	XXII

## VOLUME I

### SESSION I

Session Page

#### THE TWENTY-FIFTH BAWDEN LECTURE

The impact of climatic change on European agriculture M L Parry .....	I-1 .....	3
--	-----------	---

### SESSION 2A

#### NEW COMPOUNDS, FORMULATIONS AND USES FOR PEST CONTROL

MTI-446: a novel systemic insect control compound K Kodaka, K Kinoshita, T Wakita <i>et al.</i> .....	2A-1 .....	21
CGA 293'343: a novel broad-spectrum insecticide supporting sustainable agriculture worldwide R Senn, D Hofer, T Hoppe <i>et al.</i> .....	2A-2 .....	27
<i>Metarhizium anisopliae</i> , isolate IMI 330189: a mycoinsecticide for locust and grasshopper control D C Neethling and D R Dent .....	2A-3 .....	37
Fast release capsules: a new formulation of lambda-cyhalothrin R M Perrin, P J Wege, D G Foster <i>et al.</i> .....	2A-4 .....	43
Novaluron, optimisation and use for the control of the beet armyworm and the greenhouse whitefly I Ishaaya, N Damme and L Tirry .....	2A-5 .....	49
Preliminary investigations on effectiveness of two modern insecticides in controlling codling moth, plum moth and leaf rollers R W Olszak and Z Puciennik .....	2A-6 .....	57

### SESSION 2B

#### NEW DEVELOPMENTS IN THE MANAGEMENT AND CONTROL OF CEREAL TAKE-ALL

Take-all – the past and the future D J Yarham .....	2B-1 .....	65
Interactions between cereal husbandry and take-all: background for newer methods of controlling the disease D Hornby .....	2B-2 .....	67

Take-all ( <i>Gaeumannomyces graminis</i> var. <i>tritici</i> ) infestation survey for Germany, France and the UK, 1996-1997 J Becker, B Lavier and D J Leaper .....	2B-3 .....	77
Influence of the incidence and severity of take-all of winter wheat on yield losses and responses to different nitrogen fertilisations A Schoeny, P Lucas and M-H Jeuffroy .....	2B-4 .....	83
Root protection using fluquinconazole: a new approach to controlling cereal take-all A M Löchel, M Wenz, P E Russell <i>et al.</i> .....	2B-5 .....	89

### **SESSION 3A**

#### **PESTICIDE EFFICACY AS INFLUENCED BY FORMULATION AND ADJUVANTS**

Maintaining uptake efficiency in product formulations of contact insecticides W T Lankford.....	3A-1 .....	99
New formulation approaches to fluquinconazole for enhanced curativity and increased disease spectrum D Stock, G G Briggs, R A Bardsley and A Daniels .....	3A-2 .....	107
The toxicity response for insecticides with an ethyl fatty ester-based adjuvant R W Killick and D T Schulteis .....	3A-3 .....	115
Controls on the authorisation and use of adjuvants in the UK P J Chapman, S Mattock and R Savege.....	3A-4 .....	121

### **SESSION 3B**

#### **FOOD SAFETY: IMPLICATIONS FOR MODERN AGRICULTURE**

The role of the Food Standards Agency G J F Podger .....	3B-1 .....	129
The consumer's perspective: farm policies and our food – the need for change R Evans .....	3B-2 .....	131
The retailer's response S Ridge.....	3B-3 .....	135

### **SESSION 3C**

#### **INTEGRATED CROP MANAGEMENT – EXPERIMENTAL STUDIES**

Field experimentation for integrated cropping: the experience of the LINK IFS project N M Fisher .....	3C-1 .....	139
Experimental design and methodologies in the LIFE project: past, present and future V W L Jordan, P Brain, M A Semenov and D M Glen.....	3C-2 .....	147

Methods for evaluating farm practice and attitudes to Integrated Crop Management systems N McRoberts, G Edwards-Jones, A Sutherland and L Chadwick.....	3C-3 .....	155
Global Integrated Crop Management success stories R T Hewson, A Sagenmüller, E M Scholz-Tonga <i>et al.</i> .....	3C-4 .....	161

### **POSTER SESSION 3D**

#### **THE BIOLOGY AND CONTROL OF THRIPS**

Mass rearing of thrips and assay method for screening of insecticides T Murai .....	3D-1 .....	171
Mycoinsecticides in thrips management C A Bradley, J C Lord, S T Jaronski <i>et al.</i> .....	3D-2 .....	177
Density dependent regulation of western flower thrips <i>Frankliniella occidentalis</i> , in field peppers by the insidious flower bug, <i>Orius insidiosus</i> J E Funderburk, J Stavisky and S M Olson.....	3D-3 .....	183
Biology and prospects for enhancing biocontrol of the western flower thrips <i>Frankliniella occidentalis</i> in cut roses M Linnamäki, J Hulshof and I Vänninen .....	3D-4 .....	187
Novel strategies for improving biological control of western flower thrips on protected ornamentals – potential new biological control agents J A Bennison, K A Maulden, L R Wardlow <i>et al.</i> .....	3D-5 .....	193
Pest risk analysis to support and strengthen legislative control of a quarantine thrips: the case of <i>Thrips palmi</i> A MacLeod and R H A Baker .....	3D-6 .....	199

### **SESSION 4A**

#### **ENDOCRINE DISRUPTERS – A CAUSE FOR CONCERN?**

Background evidence for environmental effects of endocrine disrupters P Matthiessen .....	4A-1 .....	207
Endocrine disruption: the evidence for mammalian effects B M Elliott .....	4A-2 .....	217
Endocrine disrupting chemicals in the aquatic environment J P Sumpter and P Sohoni.....	4A-3 .....	225
The scientific programme of the Endocrine Modulator Steering Group (EMSG) R Taalman.....	4A-4 .....	233

### **SESSION 4B**

#### **DECISION SUPPORT SYSTEMS**

Decision Support System for Arable Crops (DESSAC): an integrated approach to decision support D H Brooks .....	4B-1 .....	239
--	------------	-----

Appropriate fungicide dose selection in a spring barley decision support module S J Wale .....	4B-2 .....	247
MORPH: expediting the production and distribution of decision support systems to the horticultural industry S B Walton .....	4B-3 .....	253
An Internet-based decision support system for the rational management of oilseed rape invertebrate pests D Morgan, K F A Walters, J N Oakley and A Lane.....	4B-4 .....	259

#### **POSTER SESSION 4C**

##### **FATE AND EFFECTS OF PESTICIDES IN THE ENVIRONMENT**

The prediction of the fate and effects of pesticides in the environment using tiered laboratory soil microcosms C A Edwards, T Knacker and A Pokarzhevskii.....	4C-1 .....	267
Implications of a first-step environmental exposure assessment for the atmospheric deposition of pesticides in the UK I G Dubus, J M Hollis, C D Brown et al. ....	4C-2 .....	273
The poisoning of animals from the negligent use of pesticides E A Barnett and M R Fletcher .....	4C-3 .....	279
Spray drift into field margins: the effect of width of buffer strip and plant species on the interception of spray drift A J Haughton, A Wilcox, K Chaney et al. ....	4C-4 .....	285
Considerations with the use of multiple dose bioassays for assessing pesticide effects on non-target arthropods L Birnie, K Shaw, B Pye and I Denholm.....	4C-5 .....	291

#### **POSTER SESSION 4D**

##### **POST-GRADUATE STUDENT POSTERS**

Development of a PCR based diagnostic technique for light leaf spot ( <i>Pyrenopeziza brassicae</i> ) on winter oilseed rape S J Foster, A M Ashby and B D L Fitt .....	4D-1 .....	299
Effects of fluquinconazole seed treatment on the cereal take-all fungus and antagonistic rhizosphere and stem-base fungi W A J M Dawson and G L Bateman.....	4D-2 .....	301
Studies investigating the effects of propamocarb hydrochloride on the production of oospores of <i>Phytophthora infestans</i> in planta L C Baines and R A Bardsley .....	4D-3 .....	303
Improving quality and quantity of the biopesticide <i>Ulocladium atrum</i> to enhance biological control of <i>Botrytis cinerea</i> S Frey and N Magan .....	4D-4 .....	305

A biorational approach to selecting mycoinsecticides for aphid management H Yeo, J K Pell, B J Pye and P G Alderson .....	4D-5 .....	307
A study of olfactory and visual cues attracting the sweet potato butterfly, <i>Acraea acerata</i> , to its host plant N Hitimana, R G McKinlay and E A Hunter .....	4D-6 .....	309
Tebufenozide and methoxyfenozide against the beet armyworm, <i>Spodoptera exigua</i> G Smagghe, W Wesemael, B Carton and L Tirry .....	4D-7 .....	311
Biodegradation of the nematicide ethoprophos in soils from the UK and Greece D G Karpouzias and A Walker .....	4D-8 .....	313
Ground spray coverage study under a field sprayer boom Y Lardoux, C Sinfort, B Bonicelli and P Enfält .....	4D-9 .....	315

## VOLUME 2

### SESSION 5A

#### NEW COMPOUNDS, FORMULATIONS AND USES FOR DISEASE CONTROL

RPA 407213: a novel fungicide for the control of downy mildews, late blight and other diseases on a range of crops R T Mercer, G Lacroix, J M Gouot and M P Latorse .....	5A-1 .....	319
Fenhexamid (KBR 2738) – a novel fungicide for control of <i>Botrytis cinerea</i> and related pathogens H-J Rosslenbroich, W Brandes, B-W Krueger <i>et al.</i> .....	5A-2 .....	327
RH-7281: a novel fungicide for control of downy mildew and late blight A R Egan, E L Michelotti, D H Young <i>et al.</i> .....	5A-3 .....	335
MON65500: a unique fungicide for the control of take-all in wheat R E Beale, D P Phillion, J M Headrick <i>et al.</i> .....	5A-4 .....	343
IKF-916 – a novel systemic fungicide for the control of oomycete plant diseases S Mitani, S Araki, N Matsuo and P Camblin .....	5A-5 .....	351
AC 382042 – a new rice blast fungicide E Sieverding, T Hirooka, T Nishiguchi <i>et al.</i> .....	5A-6 .....	359
SZX 722: a novel systemic oomycete fungicide K Stenzel, R Pontzen, T Seitz <i>et al.</i> .....	5A-7 .....	367
CGA 279202: a new broad-spectrum strobilurin fungicide P Margot, F Huggenberger, J Amrein and B Weiss .....	5A-8 .....	375

**SESSION 5B**  
**UNDERSTANDING THIRPS AS PESTS AND**  
**APPROACHES TO THEIR CONTROL**

Pest thrips in perspective T Lewis.....	5B-1 .....	385
Thrips and tospoviruses: present and future strategies for management D E Ullman, C A Casey, A E Whitfield et al. ....	5B-2 .....	391
Is there a natural enemy good enough for biological control of thrips? J C van Lenteren and A J M Loomans et al. ....	5B-3 .....	401
The commercial development of an <i>Amblyseius cucumeris</i> controlled release method for the control of <i>Frankliniella occidentalis</i> in protected crops C Sampson .....	5B-4 .....	409
Novel strategies for improving biological control of western flower thrips on protected ornamentals – attraction of western flower thrips to verbena plants E M Pow, A M Hooper, M C Luszniak et al. ....	5B-5 .....	417

**SESSION 6A**  
**INNOVATIVE METHODS OF PEST AND DISEASE MANAGEMENT**

Virus-mediated biological control of fungal plant pathogens C M Brasier.....	6A-1 .....	425
Target technology – bring the insect to the insecticide and not the insecticide to the insect O Jones and P Langley.....	6A-2 .....	433
$\beta$ 1-3 glucan, specific to a marine alga, stimulates plant defence reactions and induces broad range resistance against pathogens J M Joubert, J C Yvin, T Barchietto et al. ....	6A-3 .....	441
Potential of fuzzy logic in crop protection decision making R P Blackshaw, L Winder and M Lefley .....	6A-4 .....	449

**SESSION 6B**  
**FOOD SAFETY AND PESTICIDE RESIDUES – IS THERE A PROBLEM?**

Food safety and pesticide residues – a response by industry to customer needs M C Neale, M Gut-Rella, X Ledru and P Newton.....	6B-1 .....	457
Food safety and pesticide residues: is there a problem? A regulator's perspective C A Harris.....	6B-2 .....	465
Food safety and pesticides – a retailer's view R G Hilborn .....	6B-3 .....	471

The importance of food safety issues from the public perspective. Public perception and the consumers' interest in pesticide residues R Luijk, L Y Lefferts and E Groth III .....	6B-4 .....	475
---	------------	-----

## POSTER SESSION 6C

### FUNGICIDE AND INSECTICIDE RESISTANCE – CURRENT STATUS AND FUTUREMANAGEMENT

Confirmation of insecticide resistance in UK populations of the currant-lettuce aphid, <i>Nasonovia ribisnigri</i> M D Barber, G D Moores, I Denholm <i>et al.</i> .....	6C-1 .....	485
Response of European populations of the glasshouse whitefly, <i>Trialeurodes vaporariorum</i> , to conventional and novel insecticides K Gorman, M Cahill and I Denholm .....	6C-2 .....	491
Resistance in <i>Myzus persicae</i> : current status in Europe and future prospects P J Wege, W Parker, I Denholm <i>et al.</i> .....	6C-3 .....	497
The contribution of resistance in UK stored product pests to control failures and subsequent food contamination K B Wildey, A J Prickett, A D MacNicoll <i>et al.</i> .....	6C-4 .....	503
Intracellular proteases: their role in insecticide toxicity and resistance mechanisms R M Wilkins, S Ahmed and D Mantle .....	6C-5 .....	511
Sensitivity of <i>Phytophthora infestans</i> to fluazinam and its use in potato blight control in Northern Ireland L R Cooke, G Little and D G Wilson .....	6C-6 .....	517
Studies comparing the sensitivity of European and USA isolates of <i>Phytophthora infestans</i> to propamocarb hydrochloride R A Bardsley, R C Shattock and J Day .....	6C-7 .....	523
Comparative studies on fungicide sensitivity and other characteristics in <i>Colletotrichum</i> isolated from various plant species H Ishii, S Iwamoto, K Nishimura and M Fukaya .....	6C-8 .....	529
Factors affecting strength of selection for resistance to DMI fungicides in <i>Septoria tritici</i> R J Metcalfe, M W Shaw and P E Russell .....	6C-9 .....	555

## POSTER SESSION 6D

### MANAGEMENT OF PESTS AND DISEASES IN TROPICAL CROPS

<i>Gardenia</i> spp. as a source of botanical pesticide against the rice weevil, <i>Sitophilus oryzae</i> L. (Coleoptera, Curculionidae) in Sri Lanka C Kestenholtz and P C Stevenson .....	6D-1 .....	543
Development of biological control methods for post-harvest rots of banana L East and L Kenyon .....	6D-2 .....	549



Advancement of ideas for the use of <i>Pasteuria penetrans</i> for the biological control of root-knot nematodes ( <i>Meloidogyne</i> spp.) B Pembroke, S R Gowen and I Giannakou.....	6D-3	555
The effects of an organosilicone/latex-based adjuvant and the fungus <i>Trichoderma</i> on the efficacy of copper sprays used for the control of witches' broom disease in cocoa J R M Thacker, L V Lainé, S D Cave <i>et al.</i> ....	6D-4	561
Farmer participatory research in spraying machinery development in Colombian coffee R Aston, D A Villalba and J Arrias.....	6D-5	567

## **SESSION 7A**

### **EFFECTS OF PESTICIDES ON NON-TARGET ARTHROPODS**

The value of field studies with pesticides and non-target arthropods K C Brown.....	7A-1	575
The complimentary roles of laboratory and field testing in ecotoxicological risk assessment I Denholm, L C Birnie, P J Kennedy <i>et al.</i> ....	7A-2	583
Risk assessment and risk management of pesticide effects on non-target arthropods in Europe P A Oomen .....	7A-3	591
Predicting susceptibility of non-target insect species to different insecticide applications in winter wheat J Alford, P C H Miller, D Goulson and J M Holland.....	7A-4	599

## **POSTER SESSION 7B**

### **INTEGRATED CROP MANAGEMENT – EXPERIMENTAL RESULTS**

Intercropping for pest control: the role of predators G Armstrong, O B J Mfugale and P A Chapman.....	7B-1	607
Spatial recovery of two species of Carabidae following cumulative pesticide applications in winter wheat P E Z Berraondo, D Morgan, K F A Walters <i>et al.</i> ....	7B-2	613
A feasibility study of the use of Integrated Crop Management for outdoor ornamentals A M Hall, L Slaney and R Stevenson.....	7B-3	619
The impact of non-target arthropods of integrated compared to conventional farming: results from the LINK Integrated Farming Systems project J M Holland, S K Cook, A D Drysdale <i>et al.</i> ....	7B-4	625
The control of diseases of winter wheat using integrated farming techniques A R Leake .....	7B-5	631

Measures of sustainability in New Zealand apple orchards: investigating biodiversity in managed ecosystems D M Suckling, G M Burnip, A R Gibb and C H Wearing .....	7B-6 .....	637
Efficacy of biofertilization management of rice and soybean in the Nile delta with application of pesticides Y G Yanni.....	7B-7 .....	643

## POSTER SESSION 7C

### INNOVATIVE METHODS OF PEST AND DISEASE MANAGEMENT

Effects of a <i>Beauveria bassiana</i> -based mycoinsecticide on beneficial insects under field conditions S T Jaronski, J Lord, J Rosinska <i>et al.</i> .....	7C-1 .....	651
Forecasting and monitoring of the carrot fly ( <i>Psila rosae</i> ) in Finland I Markkula, H Ojanen and K Tiilikkala.....	7C-2 .....	657
Manipulating the behaviour of beneficial insects in cereal crops to enhance control of aphids D L Kirkland, K A Evans and T Lola-Luz.....	7C-3 .....	663
Pheromone dispersion in the canopy trunk space H W Thistle, P Shea, E Holsten and D Quilici.....	7C-4 .....	669
Entomopathogenic nematodes and fluorescent <i>Pseudomonas</i> rhizosphere bacteria inhibiting <i>Radopholus similis</i> invasion in banana roots P M Aalten and S R Gowan.....	7C-5 .....	675
Biological control of <i>Botrytis cinerea</i> by suppression of sporulation J Köhl and N J Fokkema .....	7C-6 .....	681
PCR-based detection of <i>Phytophthora fragariae</i> in raspberry and strawberry roots K J D Hughes, A J Inman, P A Beales <i>et al.</i> .....	7C-7 .....	687
Chemical and physical alternatives to methyl bromide and their combination on the control of <i>Rhizoctonia solani</i> and <i>Sclerotinia sclerotiorum</i> in the open field M L Gullino, A Minuto, G Minuto and A Garibaldi.....	7C-8 .....	693
Immunodiagnosis as an aid to the timing of fungicide sprays for the control of <i>Mycosphaerella graminicola</i> on winter wheat in the UK S J Kendall, D W Hollomon and A Selley .....	7C-9 .....	701

## VOLUME 3

### SESSION 8A

#### FARM PACKAGING WASTE AND DISPOSAL

The regulatory regime for managing and packaging waste in the agricultural sector

J C Cooper ..... 8A-1 ..... 709

Aspects of modern agrochemical packaging

D Döhnert ..... 8A-2 ..... 715

Off-farm disposal – contaminated packaging and materials

P T Jones ..... 8A-3 ..... 723

The safe disposal of clean agrochemical containers on farm

P L Carter ..... 8A-4 ..... 729

### SESSION 8B

#### NON-CHEMICAL APPROACHES TO THE CONTROL OF PLANT-PARASITIC NEMATODES

Progress towards biological control strategies for plant-parasitic nematodes

B R Kerry ..... 8B-1 ..... 739

Transgenic crops for protection from nematodes

H J Atkinson, C J Lilley, M J McPherson and P E Urwin ..... 8B-2 ..... 747

Field evaluation of *Pasteuria penetrans* for the management of root-knot nematodes

S R Gowen, G Bala, J Madulu et al. .... 8B-3 ..... 755

Theory and practice of non-chemical management of nematode pests in tropical farming systems

J Bridge ..... 8B-4 ..... 761

### SESSION 8C

#### APPLICATION OF DIAGNOSTICS IN CROP PROTECTION

Diagnostics in modern disease control strategies

D W Hollomon ..... 8C-1 ..... 771

Diagnosis and detection of phytoplasma diseases of tropical crops

L Kenyon, N P Henríquez and N A Harrison ..... 8C-2 ..... 779

The development of new diagnostic techniques and their role in improving treatment strategies for seed-borne diseases

J E Thomas, J C Reeves, E J A Taylor and D M Kenyon ..... 8C-3 ..... 787

Use of a PCR-based technique for the management of potato cyst nematodes in ware crops

K A Evans, R Harling and A Dubickas ..... 8C-4 ..... 793

## POSTER SESSION 8D

### MANAGEMENT OF PESTS AND DISEASES IN HORTICULTURAL CROPS

- Control of the carrot fly, *Psila rosae*, in carrots and parsnips without the use of organophosphorus insecticides  
N Andrews, J A Blood Smyth and J S Davies ..... 8D-1 ..... 801
- The effect of temperature, relative humidity and host plant on the behaviour of *Amblyseius californicus*, a predator of the two-spotted spider mite (*Tetranychus urticae*)  
A S Rott and D J Ponsonby ..... 8D-2 ..... 807
- CGA 293'343 effects on *Myzus persicae*: electrical penetration graph studies and effect on non-persistent virus transmission  
P Harrewijn, W J de Kogel and P G M Piron..... 8D-3 ..... 813
- Control of vine weevil (*Otiorynchus sulcatus*) in container grown ornamentals with fipronil  
R G Parsons, M A Pearce, P J Hingley *et al.* ..... 8D-4 ..... 819
- Utilising computer models to determine the risk of outbreaks of gypsy moth, *Lymantria dispar*, to the UK amenity tree industry  
J Head, R H A Baker and C H Jarvis *et al.* ..... 8D-5 ..... 823
- Studies of the sex pheromone of the European tarnished plant bug, *Lygus rugulipennis* (Heteroptera: Miridae)  
P J Innocenzi, D R Hall, C Sumathi *et al.* ..... 8D-6 ..... 829
- Monitoring and predicting the development of summer fruit tortrix moth, *Adoxophyes orana*, larvae in spring in the UK as an aid to the timing of fenoxycarb applications  
C N Jay and J V Cross..... 8D-7 ..... 833
- Squash, a reliable field indicator for the presence of the B biotype tobacco whitefly, *Bemisia tabaci*  
A E Secker, I D Bedford, P G Markham and  
M E de Courcy Williams ..... 8D-8 ..... 837
- Azoxystrobin: development on horticultural crops in Europe  
L Dacol, M Gibbard, M O Hodson and S Knight..... 8D-9 ..... 843
- The development of fenhexamid 50 WG for the control of *Botrytis cinerea* (grey mould) on soft, cane and bush fruit crops in Great Britain  
N M Adam and P A Birch..... 8D-10 ..... 849
- Control of powdery mildew with quinoxifen in horticultural crops  
E A Green, U Bernhard and L Bacci ..... 8D-11 ..... 857
- Curative activity of RPA407213 against downy mildew on grapevine: biological and microscopical study  
M P Latorse, J M Gouot and R Pepin..... 8D-12 ..... 863
- A methodology for evaluation of the efficacy of fungicide dosage and plant resistance in the control of fungal diseases of vegetable crops  
J P Clarkson, R Kennedy and J Bowtell ..... 8D-13 ..... 869

The biology and pathology of <i>Rhizoctonia solani</i> and <i>Rhizoctonia oryzae</i> isolated from crown rot of carrots in the UK A Ali, A M Hall and P Gladders .....	8D-14 .....	875
Management of disease in cucumbers ( <i>Cucumis sativus</i> ) and peppers ( <i>Capsicum annuum</i> ) by using composts as fertility inputs M F Huelsman and C A Edwards .....	8D-15 .....	881
New methods of application of borax to tree stumps for control of <i>Heterobasidion annosum</i> R J Karsky, H Thistle and M Cram .....	8D-16 .....	887

## **SESSION 9A**

### **ADVANCES IN SEED TREATMENTS**

Strategies for controlling seed-borne diseases in cereals and possibilities for reducing fungicide seed treatments B J Nielsen, A Borgen, G C Nielsen and C Scheel .....	9A-1 .....	893
Disease control by a formulation of a living bacterium B Gerhardson, M Hökeberg and L Johnsson .....	9A-2 .....	901
Seed treatment with fluquinconazole for control of cereal take-all, foliar and seed-borne diseases M Wenz, P E Russell, A M Löchel et al. ....	9A-3 .....	907
The effects of a novel seed treatment, MON 65500, on take-all severity and crop growth in winter wheat J H Spink, A P Wade, N D Paveley et al. ....	9A-4 .....	913

## **SESSION 9B**

### **FIELD BUFFER ZONES – ECOLOGICAL HAVEN OR THREAT TO PRODUCTION?**

Buffer zones to protect the aquatic environment A C Croxford .....	9B-1 .....	923
The use of field buffer zones as a regulatory measure to reduce the risk to terrestrial non-target arthropods from pesticide use R Forster and H Rothert .....	9B-2 .....	931
The value of buffer zones for the conservation of biodiversity N D Boatman .....	9B-3 .....	939
The role and practical management of buffer strips in crop production J H Orson .....	9B-4 .....	951

## **POSTER SESSION 9C**

### **CLIMATE CHANGE: PEST ISSUES**

The impact of differing climate change downscaling methodologies on entomological risk assessments C H Jarvis and D Morgan .....	9C-1 .....	961
--	------------	-----

Aphid pest potential increases at elevated CO <sub>2</sub> C S Awmack and R Harrington.....	9C-2	967
The effect of elevated atmospheric carbon dioxide on aphids and Collembola: an ecotron experiment T H Jones, T M Bezemer, K J Knight et al. ....	9C-3	973
Predicting the impacts of a non-indigenous pest on the UK potato crop under global climate change: reviewing the evidence for the Colorado beetle, <i>Leptinotarsa decemlineata</i> R H A Baker, A MacLeod, R J C Cannon et al. ....	9C-4	979

## POSTER SESSION 9D

### MANAGEMENT OF PESTS AND DISEASES IN ARABLE CROPS

Field experience with site specific application of fungicides to winter wheat K D Bjerre and B J M Secher.....	9D-1	987
Reduced dosages of strobilurins for disease management in winter wheat L N Jørgensen and G C Nielsen.....	9D-2	993
The management of <i>Stagonospora nodorum</i> on winter wheat in south west England K D Lockley, A N S Clark and I Hodgson .....	9D-3	999
Fungal diseases of white lupin ( <i>Lupinus albus</i> ) and their control J V Etheridge and G L Bateman .....	9D-4	1005
Fungicide evaluation and risk assessment of wheat stem-base diseases using PCR L W Morgan, G L Bateman, S G Edwards et al. ....	9D-5	1011
Evaluation of fungicide seed treatments against Fusarium diseases of wheat using PCR diagnostic tests S G Edwards, R Hetherington, N C Glynn et al. ....	9D-6	1017
ITITECH: a survey to improve the evaluation of relationships between cultural practices and cereal disease incidence A Cavelier, N Cavelier, A Y Colas et al. ....	9D-7	1023
A survey of <i>Tapesia yallundae</i> and <i>Tapesia acuformis</i> in UK winter wheat crops using a polymerase chain reaction diagnostic assay S J E West, G M Booth, J J Beck and L Etienne .....	9D-8	1029
A model for the prediction of yield loss in wheat due to take-all disease caused by <i>Gaeumannomyces graminis</i> var. <i>tritici</i> R E Beale, B Lavier, J Becker et al. ....	9D-9	1035
The use of a polymerase chain reaction diagnostic test to detect and estimate the severity of stem base diseases in winter wheat E S Bardsley, J Burgess, A Daniels and P Nicholson.....	9D-10	1041
The effect of site, season and cultivar on disease management strategies for winter oilseed rape grown in England and Scotland J B S Freer, P Gladders, N V Hardwick and K G Sutherland .....	9D-11	1047

Development and control of light leaf spot ( <i>Pyrenopeziza brassicae</i> ) epidemics in winter oilseed rape in the UK K G Sutherland, B D L Fitt, J M Steed <i>et al.</i> ....	9D-12	1053
Pest and disease control requirements for spring oilseed rape in northern climates C Coll, E J Booth and K G Sutherland .....	9D-13	1059
The effects of lambda-cyhalothrin on the aphid <i>Myzus persicae</i> , a vector of turnip mosaic potyvirus, and implications for its control I D Bedford, A Kelly, A Secker <i>et al.</i> .....	9D-14	1065
<i>Eurygaster integriceps</i> in Northern Iraq – strategies for optimal control R Aston, R Pascoe and M K Jordan .....	9D-15	1071
Assessing the damage caused by black bean aphid ( <i>Aphis fabae</i> ) on spring beans W E Parker and A J Biddle .....	9D-16	1077
The economic impact and evaluation of control strategies for the reduced-rate use of aphicides against winter wheat aphids in the UK J N Oakley, K F A Walters, S A Ellis and J E B Young .....	9D-17	1083
The within-field spatial and temporal distribution of the grain aphid ( <i>Sitobion avenae</i> ) in winter wheat L Winder, J M Holland and J N Perry .....	9D-18	1089
Spatial modelling of slug populations in arable crops M D F Shirley, S P Rushton, G R Port <i>et al.</i> .....	9D-19	1095

## **SESSION 10A**

### **INTEGRATED FARMING SYSTEMS: ON FARM PILOT STUDIES IN EUROPE**

Technology transfer of Integrated Farming Systems: a case study on transfer techniques, farmer responses and environmental consequences in Germany A El Titi .....	10A-1	1105
Evaluation and testing of Integrated Arable Farming Systems on innovative pilot farms in the Netherlands F G Wijnands, P van Asperen and S R M Janssens .....	10A-2	1115
A practical approach for technology transfer of Integrated Farming C J Drummond .....	10A-3	1125

## **SESSION 10B**

### **PRECISION IN CROP PRODUCTION: BENEFITS AND COSTS OF ADVANCED TECHNOLOGIES**

Precision agriculture: vive la difference P C Robert .....	10B-1	1135
Precision agriculture – new technologies B J Legg and J V Stafford .....	10B-2	1143
Precision in practice – will it be cost effective? D K Brightman .....	10B-3	1151