Thank you for using eradoc, a platform to publish electronic copies of the Rothamsted Documents. Your requested document has been scanned from original documents. If you find this document is not readible, or you suspect there are some problems, please let us know and we will correct that.



Rothamsted Experimental Station Report for 1987



Full Table of Content

Subject Index

Rothamsted Research

Rothamsted Research (1988) *Subject Index*; Rothamsted Experimental Station Report For 1987, pp 235 - 244 - **DOI:** https://doi.org/10.23637/ERADOC-1-28

SUBJECT INDEX

The papers in Part 2 have not been indexed

```
Acetohydroxyacid synthase, 84-85
                                                                Aphids,
                                                                  alarm pheromone of, 15,65
Acetohydroxybutyrate, 85
                                                                  biological control of, 55
Acid soils.
  biomass C in, 101
                                                                  cereal, 51
                                                                  infectivity with BYDV, 20,51 insecticide resistance in, 61-63
  nutrient reserves in, 108
Acridine orange, 125
                                                                  monitoring of, 51
Actinomycetes, soil, 96
Acute paralysis virus, of honeybees, 49-50
                                                                  on barley, 20
                                                                  on sugar beet, 170-171
Acyrthosiphon pisum, 45,55,64
ADAS, 34-36,163
                                                                  parasitoids of, 45-46
Adenylate energy charge measurements, in soil, 101
Advisory Committee for Genetic Manipulation, 14
                                                                  population genetics, 33, 82
                                                                  predators of, 55
Aegilops umbellulata, 88
                                                                  sex pheromone of, 64
Aerobiology, 77-79
AFRC, 16,31,36,45,88
                                                                Apical development, in winter wheat, 34
                                                                  model for, 118
                                                                Apis mellifera, See: Honeybees
  Genetic Manipulation Programme, 86
                                                                Apthona euphorbiae, 46
  Winter Wheat Model, 118
                                                                Arabidopsis thaliana, 83
Aggregation, 38-39
                                                                Arable land, leaching of nitrate from, 102-103
AGRENET, 30-31
Agricultural Development and Advisory Service,
                                                                Arion fasciatus, 46
                                                                Arion silvaticus, 46
    See: ADAS
Agricultural Genetics Company, the, 15,68,95
                                                                Aristotle University, 49
                                                                Arthur Rickwood Experimental Husbandry Farm, 166
Agrobacterium spp., 85
                                                                Aspergillus spp. 77
Agrobacterium rhizogenes, 85
                                                                Aspergillus fumigatus, 78
Agroforestry project, 33-34
                                                                ATP content, of soils, 83,100
Agviser, 11,105
                                                                Automatic data recording, of soil samples, 113
Airborne allergens, 78-79
                                                                Automatic selection, of houseflies, for
Airborne microorganisms, 78
Alarm pheromones, 15,65
                                                                       insecticide resistance, 62
Aldicarb,
                                                                Barley,
  as a nematicide, 47-49
  on sugar beet, 164
                                                                   after oats, 17
                                                                   aphids on, 20
N-alkylamides, 60
Allergens, airborne, 78-79
                                                                   development and tillering in, 17-18
                                                                   factors limiting yield, 17-25,120,129
 Alternaria spp., 23-24,71
                                                                   fungal diseases of, 19-20
 Alternaria alternata, 24,70
                                                                   genome map, 86
 Alternaria brassicae, 24,69
                                                                   hordeins of, 87-88
 Alternaria brassicicola, 24
                                                                   leaf blotch on, 19,73,77-78
 Aluminium goethites, 109-110
 Amides, insecticidal, 60
                                                                   Magie, 17,120,129
 α-Amino N, 101
                                                                   mildew on, 19
                                                                   mutants of, 84-85
 Amino acids,
                                                                   nitrogen in soil, 18
   biosynthesis of, 84-85
  N-terminal, 89
                                                                   nitrogen uptake by, 105
                                                                   Panda, 129
   replacement of, 82-83
                                                                   resistant cultivars of, 74-75
     See also: Lysine
\alpha-amylase, 88,90
                                                                   viruses of, 13,20,73-75
                                                                     See also: Barley yellow dwarf virus; Barley yellow
 β-amylase, 88
                                                                       mosaic virus; cereals; Erysiphe graminis; Take-all
 Antibiotic resistance, 87,98
                                                                 Barley yellow dwarf virus, 13,20,74-75
 Antibodies, monoclonal, 13,72,74,89
                                                                   aphid vectors of, 20,51
 Antifeedants, 15,57-58,63-64,81-82
                                                                 Barley yellow mosaic virus, 73
     See also: Polygodial
                                                                 Barnfield, light trap at, 52
 Aphicides,
                                                                 Basidiomycetes, 96
   on cereals, 51
                                                                 Battery cage system, alternatives to, 36
   on sugar beet, 164
                                                                 'Baytan', See: Triadimenol
     See also: Insecticides
                                                                 Beans (Vicia faba)
 Aphid bulletin, 51
                                                                   aphids on, 55
 Aphid commentary, 51
 Aphid honeydew, as a stimulant for parasitoids, 45
                                                                   seed rate and yields, 130
                                                                     See also: Phaseolus vulgaris
 Aphidius ervi, 45
```

Deer Con Heavy	
Bees, See: Honeybees	Cereal nematodes, 55
Beet cryptic virus, 76	Cereal seed proteins, See: Proteins
Beet cyst nematode, 54	Cereals,
Beet mild yellowing virus, 164,170-171	aphids on, 20
Beet necrotic yellow vein virus, 169	at Broom's Barn, 172-173
Beet yellows, 170-171	at Rothamsted, 128-129
See also: Virus yellows	at Woburn, 128-129
Beetles, as aphid predators, 46	biodeterioration of grains, 77
Behaviour-controlling chemicals, 63-64	diseases of, 71-75
Bemisia tabaci, insecticide resistance in, 62	fungicides on, 129
Biochemistry, of insecticide resistance, 61	protease inhibitors in, 88-89
Biodeterioration, 77	tissue culture with, 87
Biological agents, to control nematodes, 54-55	yields, 116
Biomass, See: Soil biomass	See also: Barley; Erysiphe graminis; Maize; Oats;
Biomass carbon, in acid soils, 101	Take-all; Wheat
Biomathematics, 29	Ceutorhynchus assimilis, 23
Biosynthesis, of amino acids, 84-85	China, links with, 11
Biotechnology, 13-14	Chlamydomonas reinhardii, 84
Biplots, non-linear, 38	Chloramphenicol acetyl transferase, 86-87
Birds, damage caused by, 47	Chloridazon, 174
Black dot, 75	Chlorophyll, in wheat leaves, 118
Black queen-cell virus, 50	Chloroplasts, barley, 84-85
Bolting, control of, 163	Chlorsulfuron, on sugar beet, 66,174
Boron uptake, by white clover, 107	Chlortoluron, 173
Botrytis spp., 24,71	
Botrytis cinerea, 23,70	Chromosome numbers, in potatoes, 33
Brachycaus helichrysi, 46	Chromosome stability, of regenerated potato plants, 86
	Chronic paralysis virus, of honeybees, 50
Brassica cyst nematodes, 47	Chymotrypsin inhibitors, 87-88
Brassica pod midge, 46	Cladosporium spp., 24
Breadmaking, 88,89	CLASP, 41
Bremsstrahlung sources, 111	Classical Experiments, 13
Brewing Research Foundation, 17	Classification, geostatistically constrained, 112
Brimstone Experiment, the, 33,103,109	Clay minerals, randomly interstratified, 109-110
British Council, 107	Clay soils, structure of, 108
British Sugar, 162-163,165,167	Cloud cover records, monitoring of, 168
British Technology Group, 96	Cloudy wing virus, of honeybees, 50
Broadbalk, wheat on, 102,112-113	Clover, nitrogen fixation by, 107
Broom's Barn, 9,95	Cloves, Sumatra disease of, 13,76-77
cereals at, 173	Cnephasia interjectana, 46
database package for, 31	Coefficient of variation of root dry weight, 166
farm, 172-174	Cold-induced sweetening, in potato, 82-84
sugar beet at, 161-175	Collagen, 90
weather at, 163-164	Colletotrichum coccodes, 75
wheat at, 112	Commonwealth Universities, 68
Brown foot rot, See: Fusarium spp.	Computer modelling, 89
Brown rust, on barley, See: Puccinia hordei	See also: Models
,	Computer programs, to calculate leaching losses, 102
Cadmium, concentrations of in soil, 13	Computers, 29-32
Cambridge Crystallography Subroutine Library, 110	
Cambridge University, 68	for Insect Survey, 53-54
Canker, See: Leptosphaeria maculans	See also: Statistical computing
# 프라마스 10 10 10 10 10 10 10 10 10 10 10 10 10	Conference Hall, the, 10
Canopy measurement, with a laser scanner, 124	Copper, in soils, 22
Capping,in sugar beet, 162	Coulter counter, the, 124
Carbamate, 166	Countryside Commission, 52
Carbendazim,	Coversands, in Lincolnshire, 111
on cereals, 127	Cracking, in clay soils, 108
Carbendazim + prochloraz, 18,73	Cranfield Institute of Technology, 9
Carbendazim + vinclozolin, 70	Crop experiments, statistical programs for, 35
Carbofuran, 170	Crop monitoring, with satellite systems, 168-169
Carbon, organic, in soil, 100-101	Crop plants, improvement of, 14
Carboxylation, rate of, 82	photosynthesis in, 83
Carboxylation efficiency, in sunflowers, 123	Crop rotations, 54
CAT reporter gene, 86-87	Crop Survey, 163
Catalase mutant, of barley, 84	Cultivation treatments, 103,109,126-127
Cattle, at Rothamsted, 131	Cyanobacterium, manipulation of genes from a, 82-83
See also: Livestock	Cylindrocarpon destructans, 55
Cellulose-decomposing fungi, 96	Cypermethrin, on barley, 20,173
Cereal Aphid Monitoring scheme, 51	Cyst nematodes, See: Nematodes
Cereal aphids, 45,51-52	Cytokinin gene, the, 86
corour upindo, 45,51 52	Cytokiniii gene, die, 60

236

Dark pod spot, of oilseed rape, 69 in mould fungi, 77 in potato tubers, 83-84 Dasineura brassicae (pod midges), 23,46-47 of amino acid biosynthesis, 84-85 Databases, 11,31 De Dankse Sukkerfabrikker, 82 Epson systems, 34 Ergosterol biosynthesis-inhibiting fungicides, 66 Decomposition, of wheat residues, 104 Delia coarctata, 20 Erucic acid, in oilseed rape cultivars,47 Erynia neoaphidis, 55 Deltamethrin, Erysiphe graminis (barley mildew), 19 aphid resistance to, 62,171-172 Escherichia coli, 82 on cereals, 46 Esters, pyrethroid, 59 Dennettia extracts, insecticidal activity of, 60 Demeton-S-methyl, as an aphicide on sugar beet, 170 Ethernet, 30-32 Denitrification, nitrogen losses caused by, 103 Eyespot, See: Pseudocercosporella herpotrichoides Diagnostic methods, for plant pathogens and pests, 13 Dicyandiamide, 118 Factors Limiting Yield experiments, 17-25, 120,129 Diffraction, X-ray, of soils, 109-110 Diffractometer alignment, instabilities in, 110 Famine, 12 Farm Management System, at Long Ashton, 30 Direct drilling, Farm Research Ltd., 36 into stubble, 126 Farmlink, See: Prestel Farmlink Dispersal, (E)-β-Farnesene, 65 of pathogens, 124 Fastidious prokaryotes, 76-77 of sprays, 124 Fertiliser Manufacturers' Association, 36 Disposal, of straw, 125 Fertility, soil, 12-13 Dithiothreitol, 97 Fertilizer Building, crop samples handled by, 113 DNA. extraction, from VAM fungi, 98 Fertilizers, borate, 107 15N-labelled, 102 hybridization, 85 sequences of genes, 85-86 sequencing, 56 transfer of, 87 Survey of Fertilizer Practice, 36 See also: Nitrogen fertilizers; Potassium Field beans, See: Beans DNA probes, FIELD data entry program, 35,41 for nematodes, 14 Field Drainage Experimental Unit, 103 for Sym plasmids, 98 Field Experiments, 30,35,86,95 DNA restriction length polymorphisms, 86 Field mice, in sugar beet fields, 162 Docking disorder, 163 Filter samples from working environments, 78 Domestic waste disposal, airborne microorganisms Financing, of research, 10 associated with, 78 Downy mildew, 23 Flag leaves, urea uptake by, 116 Flax tortrix moth, the, 46 Drain gauges, 103 Fluorescence characteristics, of barley mutants, 84 Drainage, in clay soils, 109 Fodder beet, 164,171 in the Brimstone Experiment, 102-103 Foliar nutrients, 22 Drainage waters, nutrients and pollutants in, 104-105 Foliar sprays, for slug control, 57 Forecasting, Drought, response of winter wheat to, 106-107 of BYDV, 51 Dry matter partitioning, in sugar beet, 122-123 of cereal aphid populations, 51 Dual inoculation, 100 of virus yellows in sugar beet, 52 Forestry, 108 Forestry Commission, the, 95,108 E4 immunoassay, the, 62-63 Earthworms, as indicators of heavy metal bioavailability, 50 'Friends of Rothamsted', 11 East of Scotland College of Agriculture, 35 Fuberidazole, 18 Fumigation-extraction and incubation techniques Eclosion, in nematodes, 56 for measuring soil biomass, 100-101 Ecology, mathematical, 38-39 Fungal diseases, Egypt bee virus, 50 of cereals, 71-73 of lupins, 71 Eisenia foetida, 50 Electromagnetic scattering properties, 53 of oilseed rape, 69-70 Electrophysiological bioassays, 53 of sunflower, 70 Electroporation techniques, 87 See also: Erysiphe graminis; Eyespot; Fusarium; ELISA technique, the, 13,70-71,170-171 BYV identification by, 74 Take-all study of take-all with, 73 Fungal spores, dispersal of, 69-70 Elson system, the, 36 for aphid control, 55 Entomogenous fungi, for aphid control, 55 for nematode control, 54-55 Entomophthora, 55 Entomophthora neoaphidis, 55 mycorrhizal, 98-100 Enzyme-linked immunosorbent assay nematophagous, 54-55 Fungicides, 66 See: ELISA technique effect on aphid populations, 51 Enzymes, effects on take-all, 66 activity of in photorespiration, 84 for sunflowers, 70 in barley mutants, 84-85

Fungicides (contd)	Herbicides,
on cereals, 129	effect on sugar beet, 66
on oilseed rape, 69	for sugar beet, 17-18
on sugar beet, 162,172	Heterodera avenae, 20
resistance to, 72	Heterodera cruciferae, 47
synthesis of, 66 See also: Names of individual chemicals used	Hindola fulva, 76
as fungicides	Hindola striata, 76
Furathiocarb, 166	Home Grown Cereals Authority, 95
Fusarium spp., 20,55,71	Home Office, 50 Honeybees (Apis mellifera),
	pollination by, 45,47
Gaeumannomyces graminis var. tritici	Varroa jacobsoni on, 49-50
effects of various fungicides on, 66	viruses of, 49-50
on barley, 19,73	Honeywell, 39
on wheat, 27	Hordeins, of barley, 87-88
See also: Take-all	Housefly (Musca domestica),
Gamma HCH, 166	knock-down resistance in, 61-62
Gas chromatography-electrophysiology, 53	sex determination in, 62 Hybrids:
Gel electrophoresis, 97	cereal, 87
Geminivirus, 76	potato, 86
Genes, amplification of, 63	sugar beet, 86-87
CAT reporter genes, 87	Hydraulic conductivity, 125-126
glutamine synthetase, 85	Hymexazol, on sugar beet, 161
manipulation of, 82-83,86-87,97-98	Hyperparasitoids, of cereal aphids, 45
regulation of expression of, 84,87-88	
symbiotic, in Rhizobium, 97	
transfer of, 86-87, 98	Image analysis sytem, 31
See also: Mutants	Immunoassay,
Genetic Manipulation, Advisory Committee on, 98	for virus detection in potatoes, 76 monitoring of insecticide resistance by, 63
'Genetically engineered' organisms, 33	Imperial College, Geology Department at, 110
Genkey, 41 Genstat, 32-33,39-40	'Infectivity Index', for barley yellow dwarf virus, 75
Genstat 5, 15-16,30,32,39-40	Infrared reflectance, 112
GHOST computer program, 32	Inoculants, granular, 15,99
Glacial sequences, in North Humberside, 110	Inoculation, crop, 15,98-99
Glasshouses, 90	Insect traps, 51-52
Gleadthorpe Experimental Husbandry Farm, 36	Insecticidal amides, 60
Gliadins, of wheat, 88	Insecticides,
Globodera pallida, 13-14,28,48-49,56	aphid resistance to, 33,52,59,61-62,171-172 combination with pheromones, 65
Globodera rostochiensis, 13-14,28,47-49,55-56	housefly resistance to, 61-62
Globulins, 88 Glomus caledonium, 97	molecular structure of, 59
Glomus mossae, 96	on cereals, 51
Glucosinolates, oilseed rape plants low in, 47	on sugar beet, 166
Glutamine synthetase, 85	whitefly resistance to, 62
Gluten, structure of, 88-89	Insects,
Glutenins, 88	fire alarms caused by, 50
Glycollate oxidase, 84	in light traps, 52
Glycolysis, 82-84	Institut für Kleintierzucht, 36 Institut National de la Recherche Agronomique, 35
Glyphosate, 164	Institute of Arable Crops Research (IACR), 9,44
Goethite See: Aluminium goethites	Institute of Food Research, 88
See: Aluminium goethites Grain legumes,	Institute of Plant Science Research, 88
See: Proteins	Institute of Terrestrial Ecology, 52,95,108
Granular inoculants, 15,99	Intensive Cereals experiment, 101
Grey mould,	Invertebrates, soil, uptake of heavy metals by, 50
See: Botrytis cinerea	IPSS, 31
Growth regulator, on oilseed rape, 21	Iron, 22
	Iron oxide mineralogy, 108-109 Irrigation,
Hamamelose bisphosphate, 20-21	of sugar beet, 163
Hatch stimulation, 55	variations caused by, 112
Health and Safety Executive, 14	ISEM, 71, 74
Health problems, due to airborne microorganisms, 78-79	Iso-electric focusing, 55,97
Heavy metals,	Isoleucine, 128
Rhizobium in presence of, 95,107 uptake of by invertebrates, 50	
Heptenophos, 172	JANET, 31
238	

Kanamycin resistance, 87 Mineralogy, of soil clays, 109-110 Kdr, See: Knock down resistance Mitotic indices, 122 Knock down resistance, in houseflies, 61-62 MLP, 40 MMG Agriseed, 82 Landsat Multispectral Scanner, 168 Mobile crop shelters, 166-167 Models, mathematical, Laser Scanner, 124 Lawes Agricultural Trust Committee, 9-10 for agroforestry project, 33-34 for conversion of energy to sugar, 165 Leaching, neighbour,37 model of, 105 non-linear, 37 nitrogen losses from, 13,103 of dry matter partitioning in sugar beet, 122 Leaf blotch (Rhynchosporium secalis), on barley, 73 of nutrient supply, 105 Leaves, spatial and temporal patterns of growth in, 124 of resistance development in houseflies, 61 Legumes, parallel, 37-38 diseases of, 70-71 splash droplet dispersal modelling, 77-78 to predict fertilizer requirements for sugar beet, 122 inoculation of, 15 Leptosphaeria maculans, 23 to predict sugar beet yields, 168 Light intensity, effect on Rubisco activity, 83 winter wheat model, 95,112-113,116 Molecular and biochemical methods, of nematode Light leafspot, See: Pyrenopeziza brassicae Light traps, 51-52 identification, 56 Molecular biology techniques, for identifying pests, 13 Limothrips cerealium, 50 Molecular structure, of insecticides, 59 Lincolnshire, coversands in, 111 Molybdenum, 22 Linseed, insects on, 46 Monoclonal antibodies, 13,72,74,89 Morphometric techniques, for identifying nematodes, 56 pollination on, 47 Mosquito, pheromones of, 64-65 Linuron, 129 Moths, monitoring of, 51 Livestock. Multivariate analysis, 38 at Broom's Barn, 174 Mung bean, manganese toxicity in, 97 feed for, 87 Musca domestica, See: Housefly statistical analysis for, 35-36 Long Ashton Research Station, 9,11,30,44,95,161 Mutants, in barley, 84-85 Mycorrhiza, vesicular arbuscular, Long-term cropping history, effects of, 102 biochemical characterization of, 97 Longidorus spp., 163 Lotus corniculatus, 85 effect on manganese toxicity, 97 for tropical legumes, 99-100 Lucerne, nematodes on, 49 Lupin aphid, the, 46 inoculants, 98 quantification of, 97 Lupins, 46 stimulation of growth of, 97 fungal invasion of, 71 susceptibility of roots to infection, 96 Lysine, 87-88 Myzus persicae, 53,52,61,171 and risk of potato virus Y, 51 Macrosiphum euphorbiae, 52 insecticide resistance in, 59,62 MAFF, 52 on sugar beet, 164,170-172 Harpenden Laboratory, 164-165 Magiscan, the, 34 Magnesium, 22 Maize, prolamins in, 89,90 15N2 labelled fertilizer, 102 National Farmers' Union, 36,163 Man-made urban soils, 111 Manganese, on sugar beet, 161 National Soils Inventory, 95 Manganese toxicity, effect of mycorrhiza on, 97 Manuring, organic, 102 Nature Conservancy Council, 52 Neighbour effects, 33-34,37 Neighbour models, 37 Market Garden Experiment, at Woburn, 33 Nematicides, Mathematical ecology, 38-39 for potatoes, 28,47-49,54 Mathematical models, See: Models for use on oilseed rape, 47 Medicago, nematode resistance in, 49 See also: Aldicarb; Oxamyl Megoura viciae, sex pheronome of, 64 Meligethes aeneus (pollen beetle), 23 Nematodes. biological agents for control of, 54-55 Meloidogyne spp., 54,56 Meloidogyne incognita, 56 brassica cyst, 47 control of, 54-55 Membrane breakdown, in sugar beet, 87 cyst, 47,54-55 Metals, heavy, 95,107 egg parasitic fungus of, 54 Methiocarb, 161,166 Metopolophium dirhodum, 51 hatching of, 56 identification of, 56 Mice, in sugar beet, 162 on lucerne, 49 Microflora of oilseed rape leaves and pods, 23-24 on oilseed rape, 23 Microlophium carnosum, 45 Micronutrients, in soils, 107-108 oxamyl on, 23 potato cyst, 47-49 Microorganisms, airborne, 78 root knot, 56-57 Mildew, See Erysiphe graminis stem, 49 Mineralization, of soil organic matter, 102

Nematophagous fungi 54.55	The state of the s
Nematophagous fungi, 54-55 Nettle aphids, 45	foliar nutrients for, 22
Nicotiana tabacum, See: Tobacco	forms and timing of nitrogen on, 120 fungicides on, 21,69
Ninhydrin-reactive N, 100	growth and development, 21
Nitrate,	insect pests on, 23
in oilseed rape residues, 103	microflora of leaves and pods, 23-24
leaching of, 13, 103	Mikado, 121
uptake of, 85	nematicide trials with, 47
Nitrate/proton symport at the tonoplast, 125	nematodes on, 23
Nitrate reductase, 117	nitrogen in plant sap, 22
Nitrification inhibitor, 119 Nitro-Chalk, 119	nitrogen in plants, 22
Nitrogen,	nitrogen in residues from, 103-104
biomass, 100-101	nitrogen in soil, 22
effect on aphid populations, 51	nutrients in roots of, 106 oil content of seed and oil yield, 120-121, 127
immobilization of, 104	photosynthetic efficiencies in, 121-122
in plant sap, 22	pod midge on, 46-47
inorganic, 104	root growth, 22
metabolism of, 84	seed and oil yield, 21-22
mineral, in soil, 17,22	spore dispersal in, 69-70
on sugar beet, 167	spray timing, 69
on winter wheat, 107	straw disposal before drilling of, 127
soil, 101,105	sulphur on, 22
supply of, 117	On-farm methods, of inoculation with Rhizobium, 99
uptake of, 35,116-117 See also: Nitrate	Opomyza florum, 26
Nitrogen fertilizers,	Organic manuring, 102
effect on reserves of organic N in soil, 101	Organic matter, turnover of in soil, 100,102,105 Orthophosphate, effects of, 83
immobilization of, 104	Overseas Development Administration, 30-31,41
losses of, 103	Oviposition pheromone, 64-65
on sugar beet, 122	Oxamyl,
on wheat, 118	on potatoes, 47-48
prediction of requirements, 122	Oxygen demand, for straw, 127
See also: Fertilizers	
Nitrogen fixation, 84,97	
Nitrogen uptake,	PAH's See: Polyaromatic hydrocarbons
by wheat, 116-117	Parallel model analysis, 37-38
by winter barley, 105 NMR spectroscopy, 84,89	Parasites, fungal, of the potato cyst nematode, 54
Nodules, root, 85	Parasitoids, of aphids, 45-56
Non-linear models, 37,40	Paratrichodorus spp., 163 Pasteuria penetrans, 54
North Humberside, glacial sequences in, 111	Patatin, 14
Novel Crop Protection Agents Group, 63	Patent application, for Rhizobium inoculum, 99
Nuclear Magnetic Resonance, See: NMR	Pathogenesis related proteins, See: PR proteins
Numerical Algorithms Group, 15,32,39	Pea aphids, 45
Nutrient fluxes,	Pea midge, pheromone studies on, 53
into roots, 106	Pea seed-borne mosaic virus, 13,70-71
Nutrient reserves, in acid upland soils, 108	Peas
Nutrient uptake, in relation to take-all rating, 128	aphids on, 70-71
Nutrients, in rain, drainage and borehole waters, 104-105 Nutritional chemistry, 35	viruses of, 70-71
Nutritional Chemistry, 33	Penconazole, 66 Penicillium spp., 77
	Peptides, synthetic, structural studies of, 89
Oat golden stripe virus, 73-74	Permethrin, 61
Oats, 130	Peronospora parasitica (downy mildew), on oilseed rape, 23
tonoplast from, 125	Peroxidase, 84
See also: Cereals	Pesticides,
ODA, See: Overseas Development Administration	aphid resistance to, 61-63
Oedothorax, 46	distribution of, in plants and soil, 65-67
Oesophageal glands, of nematodes, 55-56	on sugar beet, 162-163, 167, 172
Oilseed rape,	physico-chemical properties of, 66
Ariana, 21,69,121,128	to control Docking disorder, 163
at Rothamsted, 128-129 Rienvenu, 21-22, 69 121 128	See also: Aphicides; Fungicides; Herbicides; Insecticides
Bienvenu, 21-22, 69,121,128 biomass production, 123	and Nematicides Pests, of sugar beet, 162
bird damage to, 47	pH gradient formation, in oat tonoplasts, 125
diseases of, 23,69-70,95	pH, soil,
effect of insect pollination on, 47	changes in, 107
factors limiting yield, 20-25,120-122	See also: Soil acidity
240	
240	

Phaseolus vulgaris (French bean), Predators, of aphids, 55 granular inoculants for, 99 Prediction, of wheat yields, 112-113,116 nitrogen fixation in, 84-85 Pre-inoculated seed, 99 Phenylacetic acid, 67 Pressure probe, to measure hydraulic conductivities, 125 Pheromones, Prestel Farmlink, 11,105 alarm, 15,65 Prochloraz. in insecticide sprays, 65 on cereals, 73,127 in monitoring system for pea-midges, 53 Programs, See: Computer programs in mosquitoes, 64,65 Prokaryotes, fastidious, 76-77 sex, in aphids, 64 Prolamin storage proteins, See: Proteins Phialophora sp., 73 Propiconazole, 71,129 Phloem, transport of pesticides in, 66-67 Protease inhibitors, 88-89 Phoma leaf spot, on oilseed rape, 23-24 Protein engineering, 82-83 Phosphofructokinase, 83 Protein stains, for nematode identification, 56 Phosphoglycollate phosphatase, 84 Proteins. Phosphorus, uptake of, 106 cereal grain, 14,87-89 Photophosphorylation, 84 from potato, 14 Photorespiration, 82,84 PR. 89-90 Photorespiratory mutants, of barley, 84-85 Proton/nitrate symports, 125 Photosynthesis, 82-84 Protoplasts, regeneration from, 86-87 efficiency of, in oilseed rape, 121-122 Prunus padus, (bird cherry), 51 in sunflowers, 123 Pseudocercosporella anguioides, 72 Pseudocercosporella herpotrichoides (eyespot), 71-72 Physiological responses, in wheat, 115 Pig houses, airborne organisms in, 78 on wheat, 19-20,27 Pigs, compound feedstuff for, 35 Pseudomonas spp., 96,99 Pirimicarb, 164,171-172 Pseudomonas solanacearum, 13,77 aphid resistance to, 62 PSS, 31 on cereals, 51-52 Psylliodes chrysocephela, on oilseed rape, 23,69 Plant clinic, for sugar beet, 165 Puccinia hordei, 19 Plasmid vectors, in cyst nematodes, 56 Pyrenopeziza brassicae, on oilseed rape, 23,69 Pleospora infectoria, 24 dispersal of spores, 69-70,95 Ploughing, compared with direct drilling, 126 Pyrethroids, synthetic, 59-60 Pod midge, See: Dasineura brassicae insect resistance, 61-62 Pollen beetle, See: Meligethes aeneus non-ester, 59 Pollination, studies of, 45,47 on sugar beet, 172 Pollution, of aquifers, 104 structure-activity relationships, 59-60 Polyaromatic hydrocarbons, 12-13 Polygodial, 63-64,81-82,89 Quasi-complete Latin squares, 34,37 Polygonum hydropiper, 58,81-82 Quinacrine, 125 Polymyxa betae, 169 Polymyxa graminis, 73 'Radar taxonomy' to detect airborne insects, 53-54 Portugal, winter wheat yields in, 106-107 Radiation. Potassium, reserves of, 108 conversion of to dry matter, 121-122 Potato cyst nematodes, 13-14,28,47-49,54-55 interception of, 163-164 Potato leafroll virus, 76,86 Rain, nutrients and pollutants in, 104-105 Potato root diffusate, hatching of nematode eggs in, 56 Rainfall, 163-165 Potato virus Y, 13,51-52,75-76,86 See also: Weather Randomly interstratified minerals, 109 aphid vectors of, 76 Potatoes, Rape, See: Oilseed rape ageing of tubers, 49 Red beet, 125 cold-induced sweetening in, 82-84 Red clover, nematodes on, 49 Remote sensing, 112,168-169 Désirée, 28 diseases of, 75-76 Rennes, eyespot research at, 72 eelworm-resistant, 47-48 Reparameterization, of mixture distributors, 38 field experiment using somatic hybrids, 84 Representative soil sampling, 36 intensive production, 28 Research Institute for Photosynthesis, 83-84 nematodes on, 28,47-48 Research support, 10 patatin genes of, 14 Residues, pyrethroid, housefly resistance to, 61-62 production of somatic hybrids, 14,86 Resistance, Record, 83-84 to fungicides, 72 regeneration from protoplasts, 86 to insecticides, 59,61-63,171-172 shoot production in, 33 Respiratory symptoms, work-related, 79 Rhizobium spp., tuber diseases of, 28 tuber size, 34 effects of metals on, 95,107 genetics of 14,85,95,97-98 virus detection in, 76 Powdery mildew, See: Erysiphe graminis inoculation methods, 15,95,99 PP 969, 66 Rhizobium leguminosarum, 97 PR (pathogenesis related)-proteins, 89-90 Rhizobium meliloti, 97 Pratylenchus spp., 23 Rhizoctonia solani, (stem canker), on potatoes, 20,28

Soil fertility, changes in with time, 12 'Rhizomania', of sugar beet, 164-165,169 Rhopalosiphum padi, 20,51 Soil heterogeneity, implications of for leaching, 106 Rhynchosporium secalis, (leaf blotch), 19,73,77-78 Soil microorganisms, ecology of, 98 Soil mineralogy, 109-110 Ribosomal RNA genes, 98 Ribulose bisphosphate carboxylase, 82-84 Soil organic matter, 100-101 Rietfeld refinements, X-ray, 109-110 Soil sampling, 13 RISCAMS, 51 Soil solution concentrations, 106 Risk, of gene transfer in rhizobia, 98 Soil structure, 108-109 Root growth, Soil Survey and Land Resource Centre, 9 in oilseed rape, 22 Soil Survey, of England and Wales, 9 Root Knot nematodes, See: Nematodes Soils, Root nodules, 85 adenylate energy charge measurements in, 100-101 Roots. analysis of, 113 cereal, hydraulic conductivities in, 125-126 biomass carbon in, 100-101 oilseed rape, nutrients in, 106 fertility, 12-13 wheat, growth of, 125-126 fumigation of, 101 Rothamsted, heterogeneity of, 105 cereals at, 128-129 hydraulic conductivity, 125-126 cattle at, 131 micronutrients, in, 107 farm report, 96 nitrate leakage from, 103 oilseed rape at, 130 particle size distributions and bulk densities of, 122 triticale and rye at, 130 pH of, 107 weather at, 128 potassium in, 108 wheat at, 119-120 urban, man-made, 111 Rothamsted Drain Gauges, 103 waterlogging of, 100-101 Rothamsted Farming Service, 11,105 X-ray analysis of, 109-110 Rothamsted General Survey Program, 41 Solanum brevidens, 14 Rothamsted Insect Survey, 53-54 Somatic hybrids, of potato, 14 Cereal Aphid Monitoring Scheme, 51 'Southern blot' analysis, 88 Routine analysis, 34 Spatial variation, in soil properties, 111 Rubisco, 82-84,118,123 Spectroradiometer measurements, 121-122 Rye, 87-89,130 Spiders, in cereals, 46 Spinach chloroplasts, 20-21 Splash dispersal, 77-78,124 Spores, dispersal of, 69-70 Satellite remote sensing systems, 168-169 SPOT satellite system, 168-169 Saxmundham, 96 Spraying systems, 124-125 Scanning photomicrodensitometer, 31 Statistical analysis, 37-38 Sclerotinia sclerotiorum, 23,70 Statistical computing, 39-42 Scottish Crops Research Institute, 83 Statistical models, See: Models Screening methods, for selection of barley mutants, 84-85 Statistical surveys, 36 Statistical theory, 36-39 SDS-PAGE, 56 Searching stimulants, for parasitoids, 45 analysis and design, 37 Stem borer, See: Opomyza florum Seedbeds, cultivation and physical properties of, 109 Stem canker, See: Rhizoctonia solani Seed Certification Scheme, 171 Seed dressings, for slug control, 57 Stem flea beetle, See: Psylliodes chrysocephela Seed treatment, of sugar beet, 166 Stem nematodes, control of, 49 Seedling variability, in sugar beet, 166-167 Stomatal conductance, in sunflowers, 123 Semiochemicals, 15,45,63-65 Storage proteins, See: Proteins Semivariograms, 37 Straw. Septoria spp., on winter wheat, 27 biomass measurements in decomposing residues of, 100 Septoria tritici, 27 disposal of, 127 Sex attractants, See: Pheromones fungal decay of, 96 incorporation of, 26-28,126-127,167 Sex-determination, in houseflies, 62 Shell, 82,86 toxin production and oxygen demand, 127 Shelters, See: Mobile crop shelters Structure-activity relationships, in pyrethroids, 59-60 Shrinkage forces, in clay soils, 108 Suction traps, 51,52 Simulation models, See: Models Sudan, Experimental Station in, 112 Sitodiplosis mosellana, 26 Sugar beet, Sitona spp., aldicarb on, 164 aphids on, 164,170-172 on lupins, 46 Slugs, 46,57 at Broom's Barn, 161-175 'bolting' of, 163 Smoke detectors, triggering of by thrips, 50 chlorsulphuron damage to, 66 Soil acidity, 107 Crop Survey, 162-163 See also: pH Soil adenine nucleotide content, 101 diseases of, 169-170 Soil analysis, 113 Docking disorder, 163 Soil biomass, 100-101 dry matter partitioning in, 122 Soil bulk density, 165 fertilizers, 162

242

https://doi.org/10.23637/ERADOC-1-28

field mice in, 162 Toxin production, by straw, 125-126 fungicides on, 162 Tractors, wheeling effects from, 165-166 growth of, 162-165 Transposons, 98 irrigation of, 163 Traps, insect, 51-52 mildew on, 164-165 Tree neighbour effects, 34 nematodes on, 163 Triadimenol, ('Baytan'), 18-19 nitrogen on, 121,167 Trifolium repens, See: Clover nitrogen uptake by, 122 Triticale, 87,130 pesticides on, 162-163,167,172 Trypsin inhibitors, 88-90 pests of, 162 plant clinic for, 165 prediction of N fertilizer requirements, 122 UK, development of sunflowers in, 123 Unit of Insect Neurophysiology and Pharmacology, 9 protoplast studies with, 86-87 University of Durham, 88 radiation in, 163 University of Lancaster, 13 remote sensing of crop, 168-169 University of Sussex, 84 root dry weight, 166-167 seed treatments, 166 University of Warwick, 84-85 Urea, 24 seedling variability in, 166-167 foliar, 116-117 soil pesticides for, 162 Urease activity, in wheat, 116 straw incorporation in, 167 surveys, 36,162-163 VA mycorrhiza, See: Mycorrhiza viruses of, 162,164,169-171 VAM inoculants, 99-100 See also: Beet cryptic virus; Beet mild yellowing virus; Varroa jacobsoni mites, infestation of honeybees with, 49-50 Beet necrotic yellow vein virus; Beet yellows; Vectors, aphid, 20,51 Virus yellows Verticillium spp., interaction with nematodes, 54-55 Sulphur, Vesicular arbuscular mycorrhiza, See: Mycorrhiza elemental, 22 Vicia faba, See: Beans in compounds to stimulate growth of mycorrhiza, 97 Video-enhanced contrast microscopy, 55 Sumatra disease, of cloves, 13,76-77 Viewdata systems, 105 Sun workstations, 30-32,39-40 Virus yellows, 52,162,164 Sunflowers, 46 Viruses, diseases of, 70 aphid transmission of, 20,51 tissue culture of, 87 cryptic, 76 Super-kdr, 62 detection of, 76 SURFACE II computer program, 36 of barley, 13,20,73-75 of grain legumes, 70-71 of honeybees, 49-50 Surveys, statistical, 36 Sweetening, cold-induced, 82-84 Sweetmelon, 76 of oats, 73-74 Sym plasmids, 97 of oilseed rape, 69-70 Synthetic pyrethroids, See: Pyrethroids of potatoes, 75-76,86 of sugar beet, 52,76,162,164,169-171 of sunflower, 70 Take-all on cereals, 66,73, of tobacco, 90 ELISA studies on, 73 of tropical crops, 76 on wheat, 127-128 Visitors, to Rothamsted, 11,130 Taxonomic key, from insect scattering studies, 53 Volatility, of fungicides, 66 Tefluthrin, 166 Volunteers, 26,126 Temperature, effect on Rubisco activity, 83 Thaumatin, 90 Thematic mapper, 168-169 Warburganal, 63 Thiofanox, 170 Waste, domestic, airborne microorganisms associated with, Thiram, for seed treatment of sugar beet, 161 Threonine, 87 Watermelon, 76 Thrips, 46,50 Water-pepper, See: Polygonum hydropiper Tillage, 108-109 Water uptake, in relation to take-all, 128 Times beach, 50 Weather, 12 Tissue cultures, 86-87 at Broom's Barn, 163-164 Tobacco, at Rothamsted, 128 gene transfer in, 87 at Woburn, 128 hordein genes from, 14 Weed control, See: Herbicides PR proteins from, 89-90 Weevils, See: Sitona spp. virus diseases of, 90 Wheat, apical development, 34,117-118 Tobacco mosaic virus, 90 at Rothamsted, 119-120 at Woburn, 119-120 Tobacco whitefly, insecticide resistance in, 62 Tolerance, of potatoes to nematode attack, 47-49 Tomatoes, nematodes on, 54 Avalon, 119 Tonoplast, transport across the, 85,125 biomass production in, 123 Torch XXX UNIX system, 31 Brimstone, 120 Toxic metals, See: Heavy metals development of winter wheat, 24-25

243

Wheat (contd) diseases of, 72-73 droughting response in, 106 effect of increasing length of ley on, 101 effect of rainfall on, 106 eyespot in, 72 foliar urea on, 116-117 for breadmaking, 88-89 fungicides on, 129 genetics of, 88 gluten from, 89 grain quality, 119-120 grain yield, 24 growth and development, 117-119 Highbury, 123 in Portugal, 106-107 light interception and growth, 117 liquid fertilizer for, 119 mathematical models for, 34,116 Mercia, 119 nitrate-N in shoots, 25 nitrification inhibitor for, 119 nitrogen content of, 25 nitrogen on, 102-103,106,117-118 nitrogen requirement of, 119 nutrient uptake by, 36 on Broadbalk, 102,112-113, 120,129 photosynthesis in, 117 physiological responses in, 116-117 prediction of yields, 112-113,116 protoplasts of, 87 response to foliar urea, 116-117 root growth of, 125-126

RuBP carboxylase in, 82-84,124 sowing date, 24 Squarehead's Master, 120 take-all on, 127-128 tissue culture with, 87 uptake of urea by, 117 winter, simulation model for, 95,116 yield predictions, 116 yield variations, 112 Wheat bulb fly, 20 Wheat variety x seed rate trial, 34 Wheeling effects, in sugar beet, 165-166 White clover, See: Clover Wind-tunnel bioassay, for pheromone studies, 53 Woburn, cereals at, 128-129 lupins at, 71 Market Garden Experiment at, 33 triticate and rye at, 130 weather at, 128 wheat at, 119-120 Worms, See: Earthworms

X-ray anomalous scattering difference methods, 109 X-ray diffraction, 110-111

Yellow mosaic disorder, 76 Yemen, 76 Yields, of cereal crops, variations in, 112

Zinc. 22