

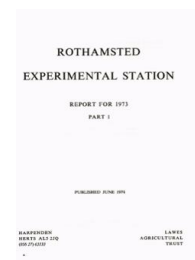
Thank you for using eradoc, a platform to publish electronic copies of the Rothamsted Documents. Your requested document has been scanned from original documents. If you find this document is not readable, or you suspect there are some problems, please let us know and we will correct that.



ROTHAMSTED
RESEARCH

Report for 1973 - Part1

[Full Table of Content](#)



Index

Rothamsted Research

Rothamsted Research (1974) *Index* ; Report For 1973 - Part1, pp 389 - 404 - DOI:
<https://doi.org/10.23637/ERADOC-1-130>

SUBJECT INDEX

Numbers in italics refer to the Abstracts of Papers on pp. 318–375. The General Report by the Director (pp. 29–36) has not been indexed.

- Abacarus hystrix*, as virus vector, 136, 138
Abies grandis, 2·15
 Abscisic acid, effect on sugar-beet growth, 100
 'AC 92100', for pests in sugar beet, 259, 263, 265, 16·23
 Acid sulphate soils, 3·2
 Actinomycetes
 in human and animal diseases, 121
 in stored products, 121
 Aerial pollution
 cereal growth and, 96
 sulphur and fluoride from brickworks, 96
Aethusa cynapium on Broadbalk, 106
 Affinity chromatography
 of diamine oxidase, 112
 of ribonucleases, 6·13
 Agricultural Development and Advisory Service (ADAS)
 blackleg on potato, 142
 crop responses to fertilisers, 219
 Drainage Arm of, 306, 309
 effect of sodium on soil physical properties, 269
 livestock experiments, 221
 milk, keeping quality of, 222
 soil mapping, 313, 314
 soil type and crop yield, 305
 survey of fertiliser practice, 222
 timing of fungicide sprays for barley, 127
 toxins in animal feeding stuffs, 121
 wheat bulb fly populations, 200, 220, 12·16
 Agricultural meteorology, 38
 Agricultural Research Council
 Advisory Committee on Computing, 230
 Sub-Committee on Library Services, 235
Agrobacterium spp., reduction of dye Nile Blue by, 82
Agropyron repens (Couchgrass)
 aminotriazole for controlling, 249, 253
 cultivation and germination, 102
 effect of N fertiliser on, 104
 fallows for controlling, 249
 germination and persistence, 102
 growth in wheat, 103, 5·15
 variation in growth of, 5·13
 wheat bulb fly on, 200
Agrostis gigantea (common bent grass)
 cultivation and germination, 102
 effect of N fertiliser on, 104
 germination and persistence, 102
 growth in wheat, 103, 5·15
 host of take-all fungus, 132
 on Broadbalk, 106, 249
 on West Barnfield, 132
 seed germination of, 102, 5·14
 Air photographs for soil survey, 310, 17·24
 Alanine, 91, 100
 Aldicarb
 absorption of, by soil, 62
 as aphicide for sugar beet, 263, 264
 as fungicide, 138
 as pesticide in beans, 141, 159, 207, 246
 effect on cereals, 158
 effect on nematodes, 150, 158, 159, 160, 162, 163, 164, 165, 265, 266, 275, 16·4, 16·16
 effect on potato yield, 244
 effect on virus diseases, 138, 140, 141
 effect on weevils in beans, 140
 for pests in sugar beet, 259, 275, 16·4, 16·16, 16·23, 16·24
 Aldicarb (*contd.*):
 uptake by earthworms, 180
 Aldrin
 as pesticide on grass, 201
 effect on cockroach, 171
 effect on myriapods, 10·35
 in bait for leaf-cutting ants, 10·41
 Algal growth
 blue-green crusts and nitrogenase activity, 84
 Chlamydomonas growth in shallow pools, 62
 composition of water and growth, 62
 Euglena in silage effluent, 62
 in lakes, 45, 61
 in land drainage water, 62
 phosphorus and, 62
 Alkali metals
 anionic complexes of, 11·5
 classical coordination chemistry of, 212
 complexes with cyclic polyethers, 214, 11·10
 complexes with macrocyclic 'crown' ethers, 214, 11·13
 complexes with phenacyl kojate, 213, 11·4
 'crown' compounds, 214
 crystal structure, 11·3, 11·5, 11·6, 11·10
 macrocyclic ring, 214
 membrane studies, 215
 Allergy produced by fungi, 119
Alopecurus myosuroides (Blackgrass)
 herbicides for control of, 106, 249
 on Broadbalk, 249
 periodicity of germination, 106
 Aluminium, reaction with montmorillonite, 3·5
 Amino acids
 assessing resemblance between, 221
 biosynthesis in crops, 108, 6·2, 6·5
 effect of K and Na on, in grass, 2·25
 in different parts of pea plants, 111
 non-protein, 6·2
 oxidation of complexes of, 111
 purification for analysis, 2·23
 Aminoacyl-tRNA synthetases, 6·4, 6·17
 2-Aminobutane, as fungicide for potato, 145
 Aminotriazole, as herbicide, 104, 249, 253
 Ammonia, anhydrous
 absorption of, by soil, 53
 autumn versus spring application, 2·27
 compared with 'Nitro-Chalk', 2·27
 injection of, into soil, 44
 Ammonia, aqueous
 autumn versus spring applications, 2·27
 compared with ammonium nitrate, 271
 compared with ammonium sulphate, 53
 compared with 'Nitro-Chalk', 2·27
 compared with sulphur-coated urea, 44, 53
 for grass, 44, 45, 53
 for sugar beet, 271
 injection into soil, 44
 nitrification of, 52, 2·14
 Ammonium nitrate
 compared with aqueous ammonia, 271
 for grass, 64
 for potatoes, 48
 sulphur-coated for sugar beet, 271
 Ammonium sulphate
 compared with aqueous ammonia, 53
 for grass, 53, 64
 nitrification of, 41, 52
 with 'N-serve' for grass, 64
 Animal Virus Research Institute, Pirbright, 210

INDEX

Numbers in italics refer to the Abstracts of Papers on pp. 318–375.

- Anticholinesterases, poisoning of honeybees by, 175
 Ants. *See* Leaf-cutting ants
Aphanocladium album, in dust during harvesting, 121
Aphanomyces cochlioides, in sugar beet, 261
 Aphicides
 demeton-S-methyl, 196, 262
 dimethoate, 174, 176
 effect on beneficial insects, 176
 for beans, 196, 251
 for grass, 138
 for sugar beet, 263
 menazon, 125, 176
 'Metasystox' (demeton-methyl), 251, 255
 phorate granules, 125, 141, 196, 251, 254, 7·8
 See also: Insecticides, Pesticides
 Aphids
 artificial diets for, 111, 175, 186
 bionomics of, 10·30
 caught in glandular hairs of *Solanum* spp., 147, 7·7
 cornicle secretions in, 184, 9·16
 damage to predators by insecticides, 175
 direct feeding damage on cereals, 125
 Entomophthora infection, 197, 198, 10·33, 10·54
 Euonymus europaeus as host of, 185, 196, 197, 263, 8·22
 fungal diseases of, 197
 host selection, 186
 lipids in, 184
 on beans, 139, 177, 196, 197, 251, 254
 on cereals, 196, 10·30, 10·31, 10·32
 on grass, 10·30
 on potato, 147, 10·38
 on sugar beet, 256, 262, 263, 264
 overwintering on beet-seed crops, 263
 overwintering on spindle trees, 185, 196, 197, 263, 8·22
 parasitised, 197
 predators of, 197, 264
 prediction of infestations, 177, 185
 resistance to insecticides, 174
 spray warnings to sugar-beet growers, 256
 traps for, 124, 193, 263
 triglycerides in, 185, 9·16
 virus transmission by, 117, 124, 137, 139, 141, 7·8, 7·9, 7·10, 7·19, 7·22, 10·3
 weekly bulletin on, 193
 Aphids, specific names of
 Acyrtosiphon pisum, 111, 141, 198, 10·54
 Aphis evonymi, 185
 Aphis fabae, 111, 141, 176, 185, 194, 196, 197, 198, 251, 263, 264
 Aphis gossypii, 118
 Macrosiphum euphorbiae, 147, 193, 7·8, 10·38
 Metopolophium dirhodum, 124, 137, 196, 7·19, 10·30, 10·31, 10·32, 10·33
 Metopolophium festucae, 137, 10·33
 Myzus persicae, 111, 137, 147, 173, 185, 186, 193, 263, 264, 7·19, 9·10, 9·16
 Rhopalosiphum padi, 124, 137, 193, 196, 7·19, 10·30, 10·31
 Sitobion avenae, 124, 137, 194, 196, 7·19, 10·30, 10·31, 10·32, 10·33
 Sitobion fragariae, 196
 Apple trees, self-fertile, 209
 Arable Reference Plots, 128
 Aromatic amines, microbial metabolism of, 2·20, 4·4
 Aspartic acid, 91
Aspergillus fumigatus, in dust during harvesting, 121
 Asulam, to control docks in grass, 251, 255
 Aswan Dam, effect on silt accumulation in Nile Delta, 71
 Atmospheric humidity, effect on plant growth, 5·7
Aureobasidium bolleyi, on cereals, 131, 134
 Auxins, 102, 5·12
Avena fatua. *See* Wild Oats
 Avon, soil survey in, 299
 Azinphos
 as insecticide, 9·8, 9·18
 Azinphos (*contd.*):
 as nematicide, 161
 toxicity to honey bees, 9·25
Azotobacter paspali, 80
Bacillus polymyxa, on potato, 142
 Barley
 combine drilling of fertilisers for, 52
 effect of air pollution on, 88, 96
 effect of nutrition on mildew, 128
 effect of soil moisture on, 95
 effect of soil salinity on, 59
 fertiliser experiments, design of, 221
 fungus diseases, 120, 125–134, 189, 190, 220, 250, 254, 280
 irrigation for, 49, 95
 K fertiliser for, 131
 liquid fertilisers for, 44, 51
 lodging, 120, 249, 280
 moulds and toxins in, 120
 N fertiliser for, 95
 P fertilisers for, 56, 131
 paraquat spray for stubble, 249
 Permanent Barley experiment on Hoosfield, 131
 risk to germination from urea, 51
 root growth related to soil moisture, 16·25
 root rots of, 131–134
 rotations, 241
 seed treatment with fungicides, 178
 silicate of soda for, 241
 sulphur uptake by, 97
 sulphur-coated urea for, 52
 virus diseases, 124, 135, 7·19
 yields, 50, 51, 56, 58, 127, 132, 241–243, 250, 254, 278, 279
 See also: Cereals; *Erysiphe graminis*; Take-all
 Barnfield, 132, 141, 243, 249
 'BAS 3170 F' (benodanil)
 as fungicide for cereals, 120, 280, 7·13
 as fungicide on grass, 138
 Beans (*Vicia faba*)
 aphids on, 139, 177, 196, 197, 251, 254
 effect of salinity on, 59
 Endogone spp. on, 141
 Equisetum in, 104, 106
 fertilisers and farmyard manure for, 243, 246
 fungus diseases, 141
 irrigation for, 246
 nematodes on, 141, 159, 246
 on Broadbalk, 243, 249
 pesticides for, 141
 roguing to decrease seed virus infection, 140
 Rothamsted-grown seed, 251
 simazine for, 250, 251, 254
 sucrose for, 92
 sucrose synthesis in, 92
 virus diseases of, 139–141, 246, 251, 7·23
 weevils in, 139–141, 207, 246
 wilt on, 141
 yields, 246, 251, 254
 Beetles
 as predators of aphids, 264
 as predators of wheat bulb fly, 200
 in sugar beet, 256, 258, 261, 16·23
 pygmy beetles, 256, 258, 261, 16·23
 Bendiocarb. *See* 'NC 6897'
 Benodanil. *See*: 'BAS 3170F'
 Benomyl
 as fungicide, 119, 120, 138, 145, 147, 178, 7·13
 breakdown product 'MBC', 147, 160, 186
 effect on earthworms, 204, 205
 effect on mycorrhiza, 81
 effect on nematodes, 150, 160, 161
 effect on potato yield, 145
 effect on *Sclerotinia* rot of clover, 138
 movement in soil, 147
 used in ant baits, 184
 Benzimidazoles
 as fungicide on potato, 145, 146
 effect on mycorrhiza, 81

Numbers in italics refer to the Abstracts of Papers on pp. 318–375.

INDEX

- Benzoylprop-ethyl, effect on soil fauna, 204, 205
 Benzyladenine
 effect on *Equisetum* germination, 105
 effect on sugar-beet growth, 100
 Berkshire, soil survey in, 297
 BHC
 as liquid fungicide, 179
 effect on bean yield, 141
 effect on weevils in beans, 141, 207
 for pests in sugar beet, 258, 259
 microencapsulation of, 179
 phytotoxicity of, 179
 poisoning of honey bees by, 175
 pre-treatment of cereal seeds with, 9·20
 retention of, by seed, 177
 volatilisation of, in tropics, 9·21
 Biodeterioration, 119
 Bioresmethrin, 168, 169, 170, 174, 9·11, 9·14
 Blackgrass. *See Alopecurus myosuroides*
 'Bladex' (cyanasine), effect on soil fauna, 204, 205
 Boron
 deficiency in sugar beet, 45, 61, 270
 effect of organic matter on, 61
 in crops and soils at Woburn, 45, 61
 in light soils, 45, 61
 in organic manures, 61
Botrytis cinerea, 165
 Breckland forest soils, 17·2
 British Sugar Corporation, 100, 268
 Broadbalk
 beans on, 243, 249
 biomass measurement on, 76
 cereals on, 43, 50, 134, 240, 249
 fungi on cereal roots on, 134
 nitrogen fixation in soils, 84
 potatoes on, 244, 249
 radiocarbon dating of soil organic matter on, 75
 Rhizobium spp. on, 82
 root zone of wheat, K and NO₃ concentrations in, 2·24
 sulphur, zinc and copper in wheat on, 51
 weeds on, 106, 249
 Broadbalk Wilderness
 biomass in, 77
 N fixation in soils, 84
 Bromophos, as insecticide, 9·18
 'Bronopol', for bacterial rot in potato, 143
 Broom's Barn farm
 cereal growth and yield compared with Rothamsted, 43, 49, 88, 94, 278
 changes in soil analyses (1960–73), 280
 cropping, 281
 livestock, 282
 soil survey of, 280
 weather, 380
 Brussels sprouts
 foraging of honey bees on, 10·36
 pollination of, 209
 Bulk density of soils, Gamma Transmission sets for measuring, 308

 Cabbage, iron deficiency and *Oplidium* infection in, 124
 Calcareous soils
 carbonates in, 60
 phosphate adsorption surfaces in, 58
 phosphate distribution in, 60
 weathering of, in a catenary sequence, 60
 Calcium, in British and Malayan soils, 2·16
 'Calixin'. *See*: Tridemorph
 Cambridgeshire
 soil survey in, 291
 soil temperature measurements in, 311
 Captafol
 as fungicide, 120, 127, 138, 7·13
 uptake by earthworms, 180
 Captan
 absorption of, by soil, 62
 uptake by worms, 180

 Carbaryl
 poisoning of honey bees by, 175
 uptake by earthworms, 180
 Carbofuran
 effect on earthworms, 204
 for pests in sugar beet, 259, 263
 Carbon dioxide
 output from soil, 41
 response curves of leaves, 40
 uptake by plants, 1·4
 Carbophenothion
 dimethyl and diethyl forms of, 9·18
 for control of saddle gall midge, 180
 for control of wheat bulb fly, 180
 Catechol
 as soil conditioner, 188
 for control of potato scab, 188, 189
 Cation-exchange parameters, Genstat program for calculating, 65
 CCC. *See*: Chlormequat chloride
Cercospora herpotrichoides. *See* Eyespot
 Cereals
 aphids on, 196, 10·30, 10·31, 10·32
 at Broom's Barn, 43, 276–280, 281
 at Broom's Barn and Rothamsted compared, 43, 49, 88, 94, 278
 at Saxmundham, 43, 44, 48
 at Woburn, 44, 241, 242, 245, 253, 254
 Aureobasidium bolleyi on, 131, 134
 'break' crops for, 253
 chytrids on, 134
 copper deficiency and 'scorch', 44, 158
 Cultivations for Cereals experiment, 135
 effect of aerial pollution on, 96
 effect of cultivation on diseases, 135
 effect of growth regulating compounds on grain metabolism, 88, 94
 effect of rainfall on yield, 44
 effect of soil nitrogen on, 44
 effect of temperature on growth, 88, 93
 Equisetum in, 104, 106
 Erysiphe graminis on, 125–128, 190, 250, 254, 7·12
 eyespot on, 135, 250, 7·12
 foliar diseases, statistical analysis of, 223
 fungicides for, 54, 120, 127, 178, 189, 7·12, 7·13
 fungus diseases on, 54, 79, 118, 120, 123, 125–135, 190, 220, 250, 254, 7·12, 7·13
 grain yield, physiology of, 5·3
 irrigation for, 43, 49, 94, 95, 96, 278
 K fertilisers for, 279
 leaf and ear water potentials, 96
 leaf area index, 89, 94, 95
 liquid fertilisers for, 44
 lodging, 51, 239, 241, 248, 250, 252, 253, 254
 N fertilisers for, 44, 48, 49–51, 89, 94, 158, 240, 246, 277, 278, 2·27
 nematodes in, 134, 149, 158, 163, 8·2
 nitrate concentrations in stems, 49–51
 on Broadbalk, 43, 50, 134, 239, 249
 P fertilisers for, 45, 279
 Rhizoctonia solani on, 136
 root growth, 5·1, 5·2, 5·4, 5·9
 root rots, 128
 rotations with sugar beet, 276, 279
 'scorch', 44, 54, 55, 158
 seed-borne pathogens, 189
 seed dressings of pesticides, 9·4
 shoot and root growth, 5·9
 soil nitrate and growth, 50
 straw disposal and disease control, 135
 take-all on, 79, 118, 123, 128–132, 134, 135, 250, 4·7, 7·12, 7·18, 7·22
 trash-borne pathogens, 135
 virus diseases, 118, 124, 135, 137, 138, 7·19, 7·22
 wheat bulb fly on, 181, 198, 220, 9·32
 yellow rust on, 135, 254, 7·12
 See also Barley, Eyespot, Maize, Oats, Take-all, Wheat
 Cereals Disease Reference Plots, 164

NSS

INDEX

Numbers in italics refer to the Abstracts of Papers on pp. 318–375.

- 'CGA 12223'
 as nematocide, 161, 265
 for pests in sugar beet, 259, 263, 265
- Chalk, shallow soils over, 308
- Cheshire
 mineralogy of soils, 307
 soil survey in, 283
 soils in, 17·4
- Chloraniformethan, as fungicide for sugar beet, 264
- Chlorfenvinphos
 effect on myriapods, 10·35
 for control of wheat bulb fly, 180
- Chloromequat chloride (CCC)
 effect on gibberellic acid in wheat grain, 94
 effect on potato scab, 188
 effect on wheat yield, 254
- 4-Chloroaniline, microbial metabolism of, 2·20, 4·4
- Chlorophenols, metabolism of, 4·9, 4·10
- Chlorophyll in plants
 breakdown products in leaf protein, 108, 6·10
 chlorophyllase and, 6·10
 increased by magnesium, 46, 64
- Chloropicrin, effect on potato yield, 244
- Chloroplasts
 enzymes in, 92
 nitrite reduction by, 6·16
 pigments in plants, 6·10, 6·12
 pseudocrystalline bodies in, 7·17
- Chlorpyrifos. *See* 'Dursban'
- Chlorthiamid, as herbicide on *Equisetum*, 104
- Chlortoluron, for control of blackgrass, 106
- Chromatography
 ion-exchange, of free amino acids, 2·23
 liquid, for assay of pesticide residues, 186
 of cytokinin, 101
 of diamine oxidase, 112
 of ribonucleases, 6·13
- Chytrids, on wheat roots, 134
- Cicer arietinum*, nitrogenase activity in, 85
- Cladosporium* spp. on wheat, fungicides for, 7·13
- Clay minerals
 in Nile-Delta sediments, 71
 interstratified expanding, 68
See also Soil Mineralogy
- Clay soil
 accumulation of P in coarse clay, 74
 distribution of major elements between size fractions, 74
 preparation of, for determining soil structure, 3·8
- Clover
 effect of benomyl sprays on, 138
Erysiphe polygoni on, 138
 infection by nodule bacteria, 79, 8·3
Sclerotinia rot of, 138
 yield, 139
- Clwyd, soil survey in, 301
- Cockroach (*Periplaneta americana*), nervous system of, 171, 172, 185, 9·17
- Codling moth, synthetic attractants for, 181
- Collembola, in sugar beet, 258
- Colocasia esculenta*, virus disease of, 118, 7·11
- Computer programming
 ARC Advisory Committee on Computing, 230
 communication processor, 236
 Fast Fourier Transform, 217
 for agricultural meteorology, 38
 for calculating accumulated temperature in soil, 305
 for calculating cation-exchange parameters, 65
 for land-capability classification, 304
 General Survey Program, 234
 information retrieval, 235
 languages, 235
 M800, 231, 232, 233, 234
 MACRO Language Processor, 235
 MLP for ICL 4-70 computer, 308
 multi-solution program, MULSA, 217
 Multijob, 231, 232, 233, 234, 236
 Numerical Algorithms Group, 234
 of movement of salts and pesticides in soils, 40
- Computer programming (*contd.*):
 SYMAP, 309
 tele-communication, 236
See also Statistical programming
- Computers
 4-70, 226, 227, 231, 308, 309
 advisory service, 233
 ARC 'Advisory Committee on Computing', 230
 ARC centralised computing service, 230
 ARC Sub-Committee on Library Services, 235
 Bristol University Computer Centre, 226
 CDC 6000 range, 227
 communications processor, 236
 Edinburgh Regional Computing Centre, 226, 230, 233, 235
 equipment, 230
 IBM 360/50, 66
 IBM 360/370, 226
 IBM 1130, 217
 ICL 1900, 227
 image analysing ('Quantimet'), 307
 Manchester University Regional Computing Centre, 227
 operations, 231, 233
 Oxford University Computing Laboratory, 227
See also Computer Programming, Statistical analyses, Statistical Programming
- Conifers
 compared with agricultural crops, 2·10
 nutrient concentrations in healthy seedlings and transplants, 2·15
 Reference experiment at Woburn, 2·10
Convolvulus arvensis, on Broadbalk, 106
- Copper
 for sugar beet, 270
 in diamine oxidase, 112, 6·11
 in plant materials, 6·11
 in wheat on Broadbalk, 51
 reactions with pyrazine, 11·3
 'scorch' in cereals and, 44, 158
- Cork
 air spores in factory, 7·15
 suberosis caused by dust from, 122
- Cornwall
 Late Pliocene marine formation in, 3·6
 soil survey in, 299
- Cotton, cross experiments in Uganda, 228
- Couchgrass. *See* *Agropyron repens*
- Coumaphos, as nematocide, 161
- Creeping thistle (*Cirsium arvense*)
 2,4-D for control of, 251
 effect of farmyard manure on, 250
- Crop physiology, 88
- Crystal structures, 217, 11·3, 11·5, 11·6, 11·7, 11·8, 11·9, 11·10, 11·11, 11·12
- Cultivation
 at Rothamsted, 42
 at Woburn, 41
 comparison with uncultivated soil, 41
 effect on cereal diseases, 135
 effect on tropical soils, 76
 mobile glasshouses for experiments on, 42
 Cultivation Weedkiller experiment, 250
 Cultivations for Cereals experiment, 135
- Cumbria
 mineralogy of soils, 307
 soil survey in, 286
- Cutworms. *See* Moths
- Cyanasine. *See* 'Bladex'
- Cyanthoate, as nematocide, 161
- Cytokinin
 assays for, 102
 column chromatography of, 101
 in sugar-beet sap, 101
 in wheat ears and leaves, 94, 5·12
 produced by rhizosphere microorganisms, 80
- 2,4-D, for controlling weeds in grass, 251
- Dalapon, as herbicide on wild oats, 249

Numbers in italics refer to the Abstracts of Papers on pp. 318–375.

INDEX

- Daminozide (aminozide), as haulm spray for potatoes, 188
- Dazomet
as fungicide, 138
as nematicide, 157, 158, 160, 161, 8·26
effect on maize yield, 246
- 'D-D'
as nematicide on potatoes, 157
as nematicide on sugar beet, 278, 16·16, 16·26
- DDT
effect on myriapods, 10·35
loss from plant surfaces, 9·9
microencapsulation of, 179
rate of uptake by earthworms, 10·34
resistance of housefly to, 173
- Decomposition of plant material in soil, 76
- Demeton-methyl. *See* 'Metasystox'
- Demeton-S-methyl
as aphicide, 196, 262, 263
microencapsulation of, 179
- Denchworth soil series
interstratified expanding clay mineral from, 68
major and minor elements in, 73
- Derbyshire, soil survey in, 293
- Devon
mineralogy of soils, 307
soil survey in, 300
soil water/air regimes in, 305
- 'Dexon'
as fungicide on sugar beet, 261
as pesticide on beans, 141, 207
- Diamine oxidase
affinity chromatography of, 112
copper-containing, 112, 6·11
- Diazinon
effect on myriapods, 10·35
for pests in sugar beet, 259
metabolites in sheep, 9·19, 9·22
resistance of housefly to, 173
uptake by earthworms, 180
- Dichlorprop, applied with liquid fertiliser to grass, 54
- Dicrotophos, aphid resistance to, 174
- Dieldrin (HEOD)
analysis of, in leaves, 9·29
aphid resistance to, 174
as fungicide on barley seed, 178
effect on cockroach, 171
effect on weevils in beans, 207
for pests in sugar beet, 257, 258
for wheat bulb fly, 180
insecticides related to, 171
mercury/dieldrin for wheat, 254
methiocarb as replacement for, 256
microencapsulation of, 179
movement in cotton plants, 9·28
withdrawal of, from use, 180
- Diethyl phosphates, as nematicides, 161
- Diethyl phosphorothioates, as nematicides, 161
- Dimethoate
aphid resistance to, 174, 175, 176, 9·10
as pesticide on grass, 201
housefly resistance to, 173, 174, 9·30
- Dimethoxon, aphid resistance to, 174
- Dimethyl phosphates, as nematicides, 161
- Dimethyl phosphorothioates, as nematicides, 161
- Dimetilan, aphid resistance to, 174
- Diptera, caught in traps, 201
- Disulfoton
aphid resistance to, 174
effect on myriapods, 10·35
microencapsulation of, 179
- 'Di-Trapex CP', as nematicide, 160
- 'Dowco 275'
as nematicide, 160, 162, 163, 164, 165
uptake by earthworms, 180
- Drainage water, algal growth in, 62
- 'Du Pont 1410'
as nematicide, 160, 161, 162, 163, 164, 165, 259, 265, 266
for pests in sugar beet, 259, 265, 266, 16·23
- 'Du Pont 1642', as nematicide, 161
- 'Dursban' (chlorpyrifos), as nematicide, 161
- Dust hazards during harvesting, 121
- Dyfed
minor elements in soils, 312
soil survey in, 303
- Earthworms
effect of cultivation on, 205
effect of fertilisers on, 205
effect of pesticides on, 180, 204, 10·34
effect of stubble burning on, 205
in Park Grass, 204
palatability of leaves to, 205
rate of uptake of DDT by, 10·34
stimulation of, electrically, 205
- East African Agricultural and Forestry Research Organisation, 118
- Electronmicroscopy
of nematodes, 149, 150
of viruses, 118, 137
See also Scanning electron microscopy
- Electrophoresis, for separating nematode species, 149
- Endogone* spp.
factors affecting occurrence in soil, 81
in beans, 141
inoculation of roots with spores, 81
on wheat roots, 134
vesicular-arbuscular mycorrhiza and, 80
- Endosulfan
as fungicide, 138
as insecticide, 9·8
effect on earthworms, 204
effect on mites causing virus disease, 138
toxicity to honey bees, 9·25
- Endrin, effect on earthworms, 204
- Entomophthora* spp.
infecting aphids, 197, 198, 10·33, 10·54
on wheat bulb fly, 199, 10·55, 12·27
resting spore formation by, 198
survival in mummified aphids, 10·54
- Enzymes
affinity chromatography and, 112
photosynthesis and, 88, 91
sucrose synthesis by, 93
- Equisetum arvense* (Field horsetail)
biological characteristics of, 89
effect of benzyladenine on germination, 105
effect of gibberellic acid on germination, 105
effect of herbicides on, 104
effect of N fertiliser on, 106
effect of rotary cultivation on, 105
effect of soil acidity on, 106
on Broadbalk, 106, 249
on Woburn farm, 253
- Erwinia carotovora* (blackleg), on potatoes, 142, 143
- Erysiphe graminis* (powdery mildew)
effect of host nutrition on, 128
ethirimol-tolerant strains of, 126
on cereals, 125–128, 190, 250, 254, 7·12
on grass, 138
- Erysiphe polygoni*, on clover, 138
- Essex
crop yield and soil type in, 305
soil survey in, 297
water-table levels in, 306
- Ethirimol, as fungicide on cereals, 126, 128, 250, 251, 254, 280, 7·13
- Ethyl mercuric chloride, as fungicide for seeds, 189
- Euonymus europaeus* (spindle tree)
as host for aphids, 185, 196, 197, 263, 8·22
nematodes on, 8·22
- Eutrophication, 45, 61
- Evaporation, 38, 39, 40
- Exhaustion land, 249
- Experimental design, early history of, 13·1
- Eyespot (*Cercospora herpotrichoides*)
effect of cultivation on, 135
fungicides for, 7·12

INDEX

Numbers in italics refer to the Abstracts of Papers on pp. 318–375.

- Farmers' lung, caused by mouldy hay, 121
 Farmyard manure
 boron in, 61
 for beans, 243
 for cereals, 50, 239, 241
 for potatoes, 46, 47, 244, 2·28
 Feeding stuffs, toxins in, 121
 Fenamiphos. *See* 'Nemacur'
 Fentirothion, 141
 Fenthion, resistance of housefly to, 173
 Fentin hydroxide, as fungicide for sugar beet, 265, 266
 Fertiliser Manufacturers' Association, 222
 Fertilisers
 computer program for movement of, in soil, 40
 deep incorporation of, for potatoes, 2·28
 field experimentation, development of, 12·11
 liquid, 44, 51, 54, 62
 movement in soil by diffusion, 40
 planning and design of experiments, 221
 slow-acting, 43, 44, 48, 52, 53
 sulphur-coated urea, 43, 44, 48, 52, 53
 Survey of Fertiliser Practice, 222
 See also Liquid fertilisers and names of individual fertilisers
 Field beans (*Vicia faba*). *See* Beans
 Flood water, soil pollution by, 72
 Fluoride
 concentration in barley, 97
 gladiolus damaged by, 97
 pollution from brickfields, 96
 Fonophos, as nematicide, 161
 Formaldehyde, effect on bean yield, 141
 Formalin
 effect on earthworms, 205
 effect on nematodes (nematicide), 158
 Fossil energy, economics of using, 79
 Fungi
 allergy produced by, 119
 virus-like particles in, 118
 zoosporic, 124
 Fungicides
 amounts on commercially treated seeds, 178
 applied with liquid fertiliser, 55
 Chemical Liaison Unit, 168
 design of experiments on time of application, 127
 effect of crop nutrition on, 128
 effect on barley yield, 126
 effect on mycorrhiza, 168
 effect on weevils in beans, 207
 effectiveness of, 190
 for cereal foliage and root diseases, 120, 7·12, 7·13
 for grass diseases, 138
 for seed-borne diseases, 189
 for sugar beet, 264
 fungi tolerant to, 167
 gum arabic solution as adhesive, 178
 liquid seed treatments, 179
 mercury on cereal seed, 178, 189
 mode of action of, 167
 movement in soil, 146
 organomercury, 189
 scorching of wheat by, 55
 seed treatment with, 178, 189
 systemic, 168, 178, 189, 190, 7·12
 time of application to barley, 126
 Fungus diseases
 allergy caused by, 119
 dust hazards during harvesting, 121
 effect of host nutrition on, 128
 effect of N fertilisers on, 128, 138
 effect on lodging in barley, 120
 farmers' lung, 121
 from mouldy cork, 122, 7·15
 in feeding stuffs, 120
 in stored products, 121
 mouldy hay and, 121, 122, 190
 of sheep, 121
 spore catches in cereal crops, 126
 suberosis, 122
 See also *Erysiphe*, Eyespot, Take-all
Fusarium spp.
 in feeding stuffs, 120
 on barley, 120, 189
 on potato, 148
 on ryegrass, 138
Gaeumannomyces graminis. *See* Take-all
 Garden Clover, 245
 Ghana, radiocarbon dating of soil organic matter in, 76
 Gibberellic acid
 effect of chlormequat chloride on, 94
 effect on *Equisetum* germination, 105
 effect on sugar-beet growth, 100
 in wheat grain, 93
 Gibberellins
 in wheat leaves, 5·12
 produced by rhizosphere microorganisms, 80
 Glauconite, weathering of, 3·11
 Gleyed clayey soils, water regimes in, 17·31
 Gloucestershire, soils in, 17·1
 Glycerate
 in sugar beet, 100
 metabolism of, in leaves, 92
 Glycine
 enzymic synthesis, of, 91
 in sugar beet, 100
 metabolism in leaves, 92
 Glycine betaine, 102
 Glycollate, 91, 92
 Glycollate pathway, 92
 Goethite, 70
 Grass
 ammonium sulphate for, 53, 64
 aphids on, 10·30
 aqueous ammonia for, 44, 45, 53, 2·14
 carbohydrates in, effect of K and Na on, 2·25, 2·26
 dipterous stem borers in, 203
 effect of fertilisers on fungus diseases of, 138
 effect of magnesium fertilisers on, 46, 60, 64
 Erysiphe graminis on, 138
 for silage, 2·27
 fungicides for, 138
 fungus diseases of, 136, 138
 Helminthosporium spp. on, 138
 herbicides applied with liquid fertiliser on, 54
 in rotation with potatoes, 245
 insecticides for old and new, 201
 invertebrates in, 201
 irrigation for, 251
 Ley-Arable experiment at Woburn, 239, 244
 liquid fertilisers for, 44, 54–56
 N fertilisers for, 44, 45, 52, 53, 64, 251, 255, 2·27
 nitrification of aqueous ammonia under, 2·14
 Puccinia coronata on, 136, 138
 soil compaction in, 312
 sulphur-coated urea for, 44, 52
 vesicular-arbuscular mycorrhiza of, 80
 viruses on, 136, 138, 7·20
 weeds in, 251, 255
 Grassland Research Institute, 130, 192, 201
 Great Hoos Field, 249
 Ground cover, photographic technique to estimate, 39
 Groundnuts (*Arachis hypogaea*), uptake of sulphur by, 2·21
 Growth substances and growth regulators
 'AC 99524', 276
 as haulm-spray for potatoes, 188
 chlorfluorecol-methyl, 267
 chlormequat chloride, 94, 188, 254
 control of potato common scab by, 188
 effect on starch accumulation in wheat, 94
 effect on sugar-beet growth, 100, 101, 267, 276
 endogenous in sugar beet, 101
 'Ethrel', 267
 gibberellic acid, 93, 94, 100, 105
 gibberellin-like substances, 101
 in wheat leaves and grain, 93, 5·12
 indolacetic acid, 80, 100

Numbers in italics refer to the Abstracts of Papers on pp. 318–375.

INDEX

- Growth substances and growth regulators (*contd.*):
 production by *Azotobacter paspali*, 80
 Guinea grass, virus disease of, 118
- Harvesting, dust hazards during, 121
 Hay, mouldy, 122, 190
Helminthosporium spp.
 on barley, 131
 on potato, 144, 145, 146, 147
 on ryegrass, 138
 Hematite, 70
 HEOD. *See* Dieldrin
 Heptachlor epoxide, effect on cockroach, 171
 Herbicides
 aminotriazole, 103, 249, 253
 asulam, 251, 255
 chlorthiamid, 104
 2,4-D, 251
 dichlorprop, 54
 effect on earthworms, 204
 effect on soil arthropods, 205
 for control of blackgrass, 106
 for weeds in grass, 251
 fungicide applied with, 55
 linuron/paraquat, 254
 liquid fertiliser applied with, 45, 54
 MCPA, 54
 microbial degradation of, 87, 4·3
 N-phosphonomethylglycerine, 104
 paraquat, 249, 253
 poisoning of honeybees by, 176
 pre-emergence, 251, 276
 pyrazone, 261, 276
 scorching of cereals and grass by, 54
 simazine, 250, 251, 254
 stunting of pea plants by, 163
 terbutryne, 106, 249
- Herefordshire, soil survey in, 295
 Honeybees (*Apis mellifera*)
 brood rearing, effect of restricted space on, 207
 'court' of workers around queen, 10·29
 dancing, 208
 diseases, 209, 10·23, 10·24
 food storage, 208
 footprint substances, 208
 foraging, 208, 9·25, 10·36
Nosema apis in, 10·22
 picornaviruses in, 10·24
 poisoning of, by pesticides, 175, 9·7, 9·25
 pollination by, 209, 10·13, 10·36, 10·37
 queen rearing, effect of hive space on, 10·50
 robber bees, 10·36
 swarming, effect of queen 'piping' on, 207
 virus diseases of, 209, 10·23, 10·24
- Hoos Barley experiment, 131, 241, 243, 244
 Hoosfield, 128, 131
 Housefly (*Musca domestica*)
 insecticides for, 169, 173, 9·6, 9·15, 9·30, 9·31
 resistance to insecticides, 173, 9·6, 9·15, 9·30, 9·31
 Hydraulic conductivity, method of determining, 307
 Hydrodynamic dispersion of salts through soil, 40, 1·6
 Hydromorphic soils, 3·1
 8-Hydroxyquinoline derivative of silica gel, 112
- Indolacetic acid
 effect on sugar-beet growth, 100
 produced by rhizosphere microorganisms, 80
- Insect traps
 aphids in, 124, 193, 263
 attractant, 181
 beetles caught in, 201, 264
 codling moths caught in, 181
 cutworms caught in, 204
 Diptera caught in, 201
 emergence traps, 201
 light, 194, 202, 220, 10·27, 10·28, 10·40, 10·52
 moths in, 181, 194, 202, 10·40, 10·52
 pitfall, 200, 257, 264
 'Sectar' and 'Wing' sticky traps, 181
- Insect traps (*contd.*):
 sticky, 181, 256, 263
 suction, 124, 140, 193, 256, 10·28
 weevils caught in, 141
- Insecticides
 acetylcholinesterases, 174, 175, 176
 adhesives for powder seed treatment, 177, 9·20
 aphid resistance to, 174
 assays by probit analysis, 220
 bioresmethrin, 168, 169, 170, 174, 9·11, 9·14
 carbamate, 261
 cyclic polyethers, 171
 cyclodienes, 171
 damage to predators of aphids by, 175
 decomposition of, 167
 delayed toxic action of, 183
 dichlorvos resin strip, 176
 effect on beneficial insects, 176
 effect on earthworms, 180, 204, 10·34
 effect on housefly, 169
 effect on mustard beetle, 169
 effect on myriapods, 10·35
 effect on pollinating insects, 177
 effect on soil arthropods, 205
 effect on virus diseases, 140
 effect on weevils in beans, 207
 ethanochrysanthemate, 168
 evaporation from insect cuticle, 175
 for aphids, 125, 138, 141, 174, 196, 251, 262, 263, 7·8, 10·38
 for pests in sugar beet, 258
 in soil, 9·18
 method of estimating in insects, 176
 molecular structure and insecticidal activity, 167, 168
 'NRDC 104', 169
 'NRDC 143', 167, 169, 9·12, 9·13
 neurotoxicity, 171, 172
 organophosphorus, 173, 174, 261, 9·10, 9·30, 9·31
 photostable, 167, 168, 169, 9·12, 9·13
 poisoning of honeybees by, 175, 9·7, 9·25
 polyethers, 171
 pre-blossom treatment with, 196
 pyrethrins, 172, 9·3, 9·14, 9·15
 pyrethroids, 167, 168, 169, 170, 174, 9·11, 9·12, 9·13
 radiolabelling of, 9·5, 9·14
 resistance of insects to, 172, 173, 9·30, 9·31
 resmethrin, 169, 174, 9·15
 retention of powders of, 177
 seed treatment with, 177–179, 258, 9·20
 systemic, 173, 175, 186
 times of application, 125, 196
 toxicity to mammals, 169
 volatilisation of organochlorine, 9·27
See also Aphicides; Pyrethrins; Pyrethroids; and names of individual insecticides
- Insects
 aggregation of species, 219
 distribution and abundance of, 10·20
 flight periodicity, 10·51, 10·53
 in wheat and fallow, 200
 migration of, 10·5, 10·51, 10·53
 monitor surveying for, 10·18, 10·20
 moonlight, effect on catches, 10·26, 10·27
 nervous system, neuroanatomy of, 171, 172
 pollination by, 209, 10·13, 10·36, 10·37
 rearing of, 186
 Rothamsted Insect Survey, 193, 220, 222, 10·21
 suction sampler, 9·8
 transport of, 10·14
See also names of individual insects
- Iran, carbonates in catenary sequence of soils, 60
- Irrigation
 at Rothamsted, 39
 at Woburn, 39
 crop growth and, 39
 effect on potato yield, 39, 146, 156
 effect on sugar beet, 266, 267, 271, 272, 16·18, 16·19, 16·27

INDEX

Numbers in italics refer to the Abstracts of Papers on pp. 318–375.

- Irrigation (contd.):**
 evaporation rate and, 39
 for beans, 246
 for grass, 251
 leaf water potential and, 39
 on cereals, 43, 49, 94–96, 278
 stomatal resistance and, 39
See also under crops
 Isobutylidene diurea for sugar beet, 274
 'Isolan', aphid resistance to, 174
 Isothiocyanates, as nematicides, 161
- Javesella pellucida*, as virus carrier, 137
- Kale**
 effect of atmospheric humidity on, 5·7
Equisetum in, 104
 pollination of, 209, 10·37
 virus disease of, 7·14
- Kent**
 soil survey in, 298
 soils in, 17·3, 17·5
- Kenya, bacterial wilt of potatoes in, 228
- Land capability classification, 304
 Land classification, value of soil map for, 17·33
 Langmuir equation, as model for P adsorption by soils, 58
- Lead**
 contamination by soil dust, 75
 in motorway runoff, 72, 74, 75
 in soils and herbage at Rothamsted, 75
- Leaf pigments, leaf protein and, 109**
- Leaf protein**
 carbohydrate content of, 109
 carotene in, 109
 chlorophyll breakdown products in, 108, 6·10
 chloroplast pigments in, 6·10, 6·12
 crop drying for, 6·9
 effect of N fertiliser on, 109
 extraction plant transferred to Reading, 108
 leaf pigments and, 109
 nutritional quality of, 110
 preservation and storage, 6·8
 skin lesions in rats fed on, 108
 xanthophyll in, 109
- Leaf water potential, 39**
- Leaf-cutting ants**
 control of, 10·7
 foraging, 10·44, 10·45
 insecticides for, 183
 pharyngeal glands of, 9·26
 phytochemical arrestants for, 183
 poison baits for, 182–184, 10·17, 10·41, 10·42, 10·43
 trail pheromones as attractants for, 183
- Leghaemoglobin, method of purifying, 86
- Legumes**
 inoculation with *Endogone* spp., 80
 symbiosis in, 84
 tropical, effect of illumination on, 85
 vesicular arbuscular mycorrhiza of, 80
- Letcombe Laboratory, Wantage, 123, 124
- Ley-Arable experiment on Highfield, 130
- Leys. See Grass**
- Light response curves of leaves, 40
- Lime**
 effect on yield and composition of Park Grass, 5·5
 Long-term Liming experiment, 132
 status of soils in England and Wales, 12·12
- Limestone**
 as fertiliser for sugar beet, 270
 composition of agricultural, 2·22
 loess-containing soils on, 72
 phosphate absorption by, 58
- Lincolnshire**
 loess in soils of, 71
 soil survey in, 293
- Linuron paraquat, 251, 254
- Liquid chromatography, for assaying pesticide residues, 186
- Liquid fertilisers**
 applied with herbicide, 45, 54
 compared with 'Nitro-Chalk', 54
 damage to barley germination, 44
 eutrophication caused by, 62
 placement for barley, 51
 scorching of grass by, 54
- Livestock**
 metabolites of diazinon in sheep, 9·19, 9·22
 on Broom's Barn farm, 282
 on Rothamsted farm, 252
 on Woburn farm, 255
 planning of experiments on, 221
 sheep disease caused by mouldy hay, 121
 statistical experiments on, 222
 streptothricosis in W. African cattle, 229
 tuberculin reactions in Uganda cattle, 229
- Loess, 71, 3·10, 3·11
- Lucerne, leaf protein from, 108
- 'M & B 20266', toxicity to ants, 184
- Magnesium**
 chlorophyll in plants increased by, 46, 64
 deficiency in soils and grass, 46, 60, 64
 effect on Garden Clover, 245
 effect on N composition of ryegrass, 46
 effect on soluble carbohydrates in grass, 64
 effect on sugar beet, 45, 262, 270, 271, 2·17
 for potatoes, 2·17
 for wheat, 2·17
 forms of fertilisers, 270, 271, 2·17
 in British and Malayan soils, 2·16
 non-exchangeable release of, 60
- Maize**
 effect of dazomet on yield, 246
 fertiliser experiments in Zambia, 228
 virus diseases of, 118
 yields, 246, 281
- Malaixon, resistance of housefly to, 173, 174
- Malathion**
 aphid resistance to, 174
 effect on weevils in beans, 141
 housefly resistance to, 173
 toxicity to honeybees, 9·25
- Malayan soils, composition of, 2·16
- Malic acid, 91
- Maneb, for control of *Phoma betae* in sugar beet, 261, 262, 269, 16·20
- Manganese, for sugar beet, 262, 269, 16·20
- Market Garden experiment at Woburn, 253
- MCPA, applied with liquid fertiliser to grass, 54
- Meat Research Institute, 220
- Mecarphon, for pests in sugar beet, 257, 258, 259, 265
- Mecoprop, for controlling weeds in grass, 251
- Menazon**
 as aphicide, 125, 176
 as fungicide, 138
- Mercury/dieldrin, for wheat, 250, 254
- 'Metasystox' (demeton-methyl), as aphicide, 251, 255
- Meteorology, 38**
- Methiocarb**
 absorption of, by soil, 62
 as replacement for dieldrin for sugar beet, 256
 for pests in sugar beet, 257, 258, 259, 261, 16·23
 for slugs in potatoes, 206
- Methomyl**
 as nematicide, 161, 16·26
 effect on weevils in beans, 141
 used in ant baits, 184
- Methyl bromide, as nematicide, 160
- Methylene dioxyphenyl, resistance of housefly to, 173
- Microbial cycling of N- & P-containing compounds in soil, 79
- Microbial degradation of pesticides, 87, 4·3, 10·9
- Micrometeorology, infra-red gas analysers for, 39
- Micropolyspora faeni*, in mouldy hay, 121
- Milk, keeping quality of, 222
- Millepedes**
 aggregation of, 257

Numbers in italics refer to the Abstracts of Papers on pp. 318–375.

INDEX

- Millipedes (*contd.*):
 control of, 257, 258, 16·23
- Mineralogy. *See* Soil mineralogy
- Mites
 as virus vectors, 136, 7·20
 effect of temperature on, 206
- Molecular structure and biological activity, 212
- Molybdenum
 estimation of plant-available, 3·13
 mobilisation and fixation of, by plant matter, 3·13
- Monocrotophos, effect on soil fauna, 204, 205
- Montmorillonite, reactions with aluminium, 3·5
- Montmorillonite-chlorite, 69
- Moonlight, effect on insect catches, 10·26, 10·27
- Mosquitoes, Nodamura virus infecting, 192, 210
- Moths
 annual distribution maps, 194
 caught in light traps, 181, 194, 220, 10·40, 10·52
 codling moths, 181
 cutworms, 194, 203
 effect of illumination on, 10·52
 infection by *Microsporidan*, 204
 log-series and log-normal parameters for, 10·40
 migration of, 196
 virus disease of, 210
- Motorway contamination of reservoirs, 72
- Musca domestica*. *See* Housefly
- Mustard beetle (*Phaedon cochleariae*), insecticides for, 169
- Mycoplasma, 137
- Mycorrhiza. *See* Vesicular-arbuscular mycorrhiza
- Myriapods, 10·35
- N-acylamino acid acylase, from leaves, 6·18
- 'N-serve', 64
- National Institute of Agricultural Botany, 125, 139, 276
- National Institute for Agricultural Engineering, 122, 135
- 'NC 6897' (bendiocarb), for pests in sugar beet, 258
- 'Nemacur' (fenamiphos)
 as nematicide, 164
 uptake by earthworms, 180
- Nematicides
 breakdown in soil and crops, 8·5
 effect of distribution on nematode control, 164
 effect on weevils in beans, 207
 for cereals, 158
 for potatoes, 150, 159, 160
 for sugar beet, 265, 278
 for tomato, 160
 granules, 149, 164
 methods of application, 164, 8·26
 organophosphates, 8·16
 oxime carbamates, 8·16
 'scorch' of wheat and, 158
See also Soil sterilisation; and names of chemicals used as nematicides
- Nematodes
 beet-cyst, 162
 cereal-cyst, 149, 158, 159, 163, 8·2
 cinéphotography of, 151
 competition between pathotypes, 153
 Dutch pathotypes, 154
 effect of crop rotations on, 266
 effect of N fertilisers on, 278
 effect of phorate on, 8·25
 effect of soil compaction on, 275
 effect of soil fumigation on, 150, 157, 278, 8·16
 effect of soil moisture on, 266
 egg laying, 8·20
 electron microscopy of, 149, 151
 electrophoresis, for separating species, 149
 feeding, 8·21
 fungus attacking females, 159
 genes for resistance, 149, 152, 154
 'giant-race' of *Ditylenchus dipsaci*, 159
 hatching factors, 157, 165, 8·19
 host plants, effect on protein patterns, 151
 in beans, 141, 159, 246
- Nematodes (*contd.*):
 in onions, 164
 in potato, 149, 150, 154, 155, 156, 159, 160, 164, 254, 7·2, 8·8, 8·19, 8·26
 in resistant and susceptible oats, 158
 in sugar beet, 162, 265, 16·16, 16·17, 16·24, 16·26
 in tomato, 160
 intestinal valves of, 151
 multiplication of *Heterodera solonacearum* on potato, 155
 multiplication on resistant cultivars, 149
 'oat race' of *Ditylenchus dipsaci*, 159, 164
 on spindle trees, 8·22
 pathotypes of *Heterodera* spp., 149, 151, 152, 153, 156, 8·24
 pea-cyst, 162
 pests, biological control of, 8·13
 population studies of, 149, 8·2
 protein electrophoresis, 149, 151, 8·24
 protein patterns, 151, 158
 reproduction on *Botrytis cinerea*, 165
 root-lesion, 150
 round cyst, 149, 155
 scanning electronmicroscopy of, 149, 150, 151
 'scorch' in wheat and, 158
 spermatogenesis, 8·23
 spicule structure, 8·18
 stem nematodes, 141, 159, 164
 stylet action, mechanics of, 152
 surface morphology of, 150
 trap cropping, 157
 virus transmission by, 16·26
- Nematodes, specific names of
Aphelenchoides spp., 151
Aphelenchoides avenae, 119
Aphelenchoides blastophthorus, 119, 151, 8·20
Ditylenchus destructor, 119, 165, 8·10
Ditylenchus dipsaci, 141, 159, 164, 246
Heterodera spp., 151, 278, 8·16, 8·18, 8·23
Heterodera avenae, 158, 159, 163, 8·2, 8·24
Heterodera cruciferae, 152
Heterodera (Globodera), 8·18
Heterodera goettingiana, 162
Heterodera pallida, 149, 153, 154, 155, 156, 157, 160, 8·14
Heterodera rostochiensis, 150, 153, 154, 155, 156, 159, 160, 161, 254, 7·2, 8·8, 8·15, 8·19, 8·26
Heterodera schactii, 159, 162, 16·24
Heterodera solonacearum, 155
Hexatylus viviparus, 165
Longidorus spp., 8·11, 8·12, 8·22, 16·16, 16·17
Longidorus elongatus, 266, 8·9
Longidorus euonymus, 8·22
Longidorus leptoccephalus, 266
Longidorus macrosoma, 137
Paralongidorus spp., 8·11
Paratylenchus spp., 278, 8·25
Pratylenchus spp., 134, 150, 151, 278, 8·25
Pratylenchus penetrans, 8·6
Pratylenchus pinguaudatus, 166
Thornenema wickeni, 151
Trichodorus spp., 265, 266, 275, 278, 16·16, 16·17
Trichodorus anemones, 265, 266
Trichodorus cylindricus, 265
Trichodorus primitivus, 266
Tylenchorhynchus spp., 278, 8·25
Tylenchus spp., 278, 8·21
Xiphenema vuittenezi, 8·22
- Net assimilation rate in plants, 40, 89, 102
- Nettles (*Urtica dioica*), 'Spontox' to control, 255
- Neutron moisture meter, 38, 41, 96, 123
- N-phosphonomethylglycerine, effect on *Equisetum*, 104
- 'NF 48', as fungicide on cereals, 7·13
- Nigeria
 effect of cultivation on soils of, 76
 soil mineralogy of Western State, 69
 uptake of sulphur by groundnuts in, 2·21
- Nile-Delta sediments, clay mineralogy of, 71
- Nitrification inhibitor ('N-serve'), 64

INDEX

Numbers in italics refer to the Abstracts of Papers on pp. 318–375.

- Nitrifying bacteria in soils, 4·8
 'Nitro-Chalk'
 compared with anhydrous and aqueous ammonia, 2·27
 compared with liquid fertiliser, 54–56
 compared with urea, 54, 55
 for beans, 246
 for grass, 251
 for maize, 246
 Nitrogen fertiliser
 effect on Garden Clover, 245
 effect on nitrogen fixation, 84, 86
 effect on photosynthesis, 90, 91
 effect on potato-tuber formation, 43, 48
 for cereals, 44, 45, 48, 49, 89, 94, 158, 240, 246, 251, 252, 278
 for grass, 44, 45, 52, 53, 64, 251, 255, 2·27
 for sugar beet, 267, 268, 270, 271, 277, 278, 16·21, 16·27, 16·28
 leaching of, 45
 nitrification of, 41
 'Nitro-Chalk', 54–56, 246, 251, 2·27
 slow-release, 52
 soil moisture and crop response to, 90
 See also Ammonia anhydrous; Ammonia aqueous; Ammonium nitrate; Ammonium sulphate; 'Nitro-Chalk'; Urea
 Nitrogen fixation
 ARC Unit of, 217
 by *Azotobacter paspali*, 80
 effect of N fertiliser on, 86
 in Rothamsted soils, 84
 stimulation by vesicular-arbuscular mycorrhiza, 81
 Nitrogenase activity
 assay of, 84
 blue-green algae in soil and, 84
 effect of N fertiliser on, 84
 in tropical legumes, 85
 o-Nitrophenolate, 214, 11·6
 Nodulation
 effect of composition of root medium on, 85
 in legumes, 82
 stimulation by vesicular-arbuscular mycorrhiza, 81
 Nodules, fine structure of, 83
 Norfolk
 crop yield and soil type in, 305
 silt content of soils, 309
 soil survey in, 291
 Northumberland, soil survey in, 290
 Nottinghamshire, soil survey in, 294
 'NRDC 104', 169
 'NRDC 143', 167, 169, 9·12, 9·13
 Oats
 lodging of, 251
 nematode populations in, 158
 resistant and susceptible to nematodes, 163
 virus disease in, 125, 137
 yields, 125, 158, 163
 Ochre in field drains, 3·12
Odontites verna, 106
Oligochaetes, 10·16
Olpidium spp.
 iron deficiency in cabbage and, 124
 on wheat roots, 134
 virus transmission by, 8·22
 Omethoate, resistance of housefly to, 173, 174
 Onion
 mycorrhiza in, 81
 nematodes in, 164
Oospora spp., on potato, 145, 146, 147, 148, 7·10
 Organic carbon in soil, determination of, 3·9
 Organic chemicals, absorption of, by soil, 62
 Overseas Development Administration, 182, 228
 Oxfordshire, soil survey in, 299
 Oximecarbarnates, 8·5, 8·16
Paecilomyces farinosus, in dust during harvesting, 121
 Paleosols, 309, 17·23
 Papua New Guinea, virus diseases in, 118
 Paraoxon
 aphid resistance to, 174
 resistance of housefly to, 174
 Paraquat
 for barley stubble, 249
 on weeds and volunteer corn, 249, 253
 with linuron for weeds in potatoes, 251, 254
 Parathion
 aphid resistance to, 174, 9·10
 dimethyl and diethyl forms of, 9·18
 effect on myriapods, 10·35
 for beetles in sugar cane, 264
 for control of saddle gall midge, 180
 uptake by earthworms, 180
 Park Grass
 changes in yield and botanical composition, 5·5
 earthworms in, 204
 lead content of herbage on, 75
 radiocarbon dating of soil organic matter on, 75
 Rhizobium spp. on, 82
 soil biomass on, 77
 Pasture. *See* Grass
 Pea
 nematodes on, 162
 rate of sucrose synthesis in, 92
 Peat, 61
 Pembrokeshire
 land capability classification in, 304
 soil survey in, 303
 sulphur in soils and herbage in, 74
 trace elements in soils of, 74, 312
Penicillium frequentans, in dust from cork factory, 122
 Pennels Piece, fungi on cereal roots on, 134
Periplaneta americana. *See* Cockroach
 Permanent Barley experiment on Hoosfield, 131
 Peroxidase-catalysed reactions, 111
 Pesticide Analytical Advisory Committee, 177
 Pesticides
 adhesives for powder on seeds, 177
 adsorption by soil, 62, 2·19
 behaviour in the environment, 167, 181
 Chemical Liaison Unit at Rothamsted, 168
 degradation in soil, 87, 4·3, 10·9
 effect on soil animals, 180, 201, 203–207, 10·8, 10·12, 10·34, 10·35
 effect on virus diseases and vectors, 140
 granules and solutions, 164, 258, 263
 liquid chromatography for assaying, 186
 microencapsulation of, 179
 persistence in soil, 189, 10·10
 seed dressings, 177, 9·4
 statistical analysis for surveys, 223
 uptake by earthworms, 180, 204, 10·34
 See also Aphicides; Fungicides; Insecticides; Nematicides
Phaedon cochleariae. *See* Mustard beetle
Phaseolus vulgaris, nitrogenase activity in, 84
 Phenacyl kojate, alkali-metal complexes of, 213, 11·4
 Phenylmercuric acetate, as fungicide for seeds, 189
Phialophora radicola, on wheat, 131, 134
Phoma betae, on sugar beet, 261
Phoma exigua (gangrene), on potato, 143, 144, 146, 148
 Phorate
 as aphicide, 125, 141, 196, 251, 254; 10·38
 as pesticide on grass, 201
 effect on earthworms, 180, 204
 effect on myriapods, 10·35
 effect on nematodes, 8·25
 for weevils in beans, 141
 Phosphate fertilisers
 adsorption in soils, 58, 219
 annual dressings compared with large single ones on grass, 45, 56, 58
 residual and cumulative effect of, 45, 56, 58
 Phosphoglyceric acid, 91
 Phosphorus in soil
 adsorption by soils, 58, 219

Numbers in italics refer to the Abstracts of Papers on pp. 318–375.

INDEX

- Phosphorus in soil (*contd.*):
 Langmuir equation as model for P adsorption, 58
 uptake by mycorrhizal plants, 4·6
 Photometer, atomic adsorption flame, 65
 Photorespiration, 91, 92
 Photosynthesis
 analysis of covariance of, 90
 C₄-dicarboxylic acid pathway of, 6·12
 effect of fumigation with sulphur dioxide on, 98
 effect of N fertiliser on, 90, 91
 efficiency of, in temperate and tropical grasses, 88
 enzymes associated with, 88, 91
 estimates of, 40
 light intensity and, 89
 mathematical models for, 219
 measurement of, 89
 metabolism of products of, 92
 of cereals, 89, 91
 of sugar beet, 100
 solar radiation and, 40
 Phoxim, as nematicide, 161
Phytophthora erythroseptica (pink rot), on potatoes, 142, 250, 251
Phytophthora infestans (blight), on potato, 142, 148, 251
Phytophthora megasperma, in beans, 141
Picea abies, 2·15
Picea sitchensis, 2·15
 Picrolonic acid, as hatching agent for nematodes, 157
Pinus nigra var. *maritima*, 2·15
 Pirimicarb, as aphicide in sugar beet, 263
 Pirimiphos-methyl, as nematicide, 161
Planococcus citri, as virus vector, 118
 Plant-litter decomposition, 10·11
 Plant moisture stress, pressure bomb for measuring, 96
 Plant Protection Limited, 177, 178
 Plantector seed-treater, 178
 Ploughing. *See* Cultivation
Plusia gamma (silver-Y moth), 194, 195, 10·46, 10·47, 10·53
 Pollution
 effect on cereal growth, 96
 from brickfields, 96
 of soil, by river flood waters, 72
 Polyacrylamide gel electrophoresis in taxonomy of nematodes, 151
 Polyacrylic acid, induced resistance of tobacco plants to virus by, 117
 Polydentate ligands, 213
Polygonum aviculare, on Broadbalk, 106
Polygonum convolvulus, on Broadbalk, 106
 Polyhydroxybenzenes, for controlling potato scab, 187
Polymyxa betae, in sugar beet, 124
Polymyxa graminis, on wheat roots, 134
 Potassium fertilisers
 effect on soil structure, 268
 effect on soluble carbohydrates in grass, 2·25, 2·26
 for sugar beet, 268, 269, 16·18, 16·19
 replacement by sodium, 268, 2·25, 2·26
 Potassium in soil
 in Agdell experiment at Rothamsted, 2·11
 in British and Malayan soils, 2·16
 in root zone of wheat on Broadbalk, 2·24
 Potassium-calcium exchange in soil, 59
 Potato Marketing Board, 144, 222, 223
 Potatoes
 aphids on, 147, 10·38
 bacterial diseases, 142, 228
 black scurf (*Rhizoctonia solani*) on, 146, 148, 7·10
 blackleg (*Erwinia carotovora*) on, 142
 blight (*Phytophthora infestans*) on, 142, 148, 251
 carbon compounds in stem, 102
 common scab (*Streptomyces scabies*) on, 143, 148, 187, 188, 254, 9·23
 dry rot (*Fusarium solani*) on, 148
 effect of aldicarb and chloropicrin on yield, 244
 effect of large fertiliser dressings on, 43, 46
 effect of leys in rotation on, 245
 Potatoes (*contd.*):
 effect of row width on, 48
 effect of season, site and irrigation on, 156
 effect of seed rate on, 48
 effect of spacing of plants on, 145
 effect of storage temperature on gangrene, 143
 effect of tuber maturity on gangrene, 144
 effect of weather on disease, 142
Equisetum in, 104, 105, 106
 farmyard manure for, 46, 47, 244, 2·28
 fertiliser experiments, planning and design of, 221
 fertilisers for, 43, 46–48, 52, 56, 145, 249, 2·17, 2·28
 fumigation and delay in senescence, 157
 fungicides for, 145, 146, 187, 9·23
 gangrene (*Phoma exigua*) on, 143, 146, 147
 growth regulators as haulm sprays, 188
 'healthier' seed, 47, 142, 144
 in Woburn Ley-Arable experiment, 244, 245
 irrigation for, 39, 146, 156
 lenticel infection, 143, 7·1
 linuron/paraquat to control weeds in, 251, 254
 magnesium fertiliser for, 2·17
 mechanical fractionation of, 63
 N fertilisers for 250
 nematodes in, 149, 150, 154, 155, 159, 160, 164, 254, 7·2, 8·8, 8·26
 on Broadbalk, 244, 249
 on Hoos Barley, 244
 P fertilisers for, 56, 244
 physiology of, in relation to yield, 102
 pink rot (*Phytophthora erythroseptica*) on, 142, 250, 251
 powdery scab (*Spongospora subterranea*) on, 148
 protein cake of, for stock feed, 45, 63
Pseudomonas spp. on, 142, 144
 root growth related to soil moisture, 16·25
 rooted stem cuttings, 142
 Rothamsted-grown seed, 251
 silver scurf (*Helminthosporium solani*) on, 144, 146, 147
 skin spot (*Oospora* spp.) on, 145, 146, 147, 148, 7·10
 slug damage, 206, 251
 soil-applied pesticides for, 189
 stem infection, 146
 sulphur-coated urea for, 43, 48, 52
 Survey of Fungal Diseases, 147
 tuber formation, delay due to nitrate, 43, 48
 tuber initiation, 102
Verticillium dahliae on, 150, 159, 7·2, 8·8
 virus diseases of, 110, 117, 147, 148, 7·8, 7·9, 7·20, 10·38
 Virus Tested Stem Cutting Grade, 142
 yields, 39, 46, 47, 57, 145, 146, 156, 160, 188, 244, 249, 251
 yields from commercial and 'healthier' seed, 145
 'Potential' growth rate of crops, 38
 'PP 505', for pests in sugar beet, 257, 258, 259
 PRB-8(α -chloro- β -(3-chloro-*o*-tolyl)propionitrile, effect on sugar-beet growth, 100
 'Prebane'. *See* Terbutryne
 Proline, in leaves of pea plants, 111
 Propionic acid, to control moulding in hay, 122, 190
 Protoplasts
 chloroplasts of, 7·17
 infection of, with viruses, 7·5, 7·6
 preparation of, 116, 119
Pseudomonas spp. on potato, 142, 144
Puccinia coronata (crown rust), on ryegrass, 136, 138
Puccinia graminis tritici, virus-like particles in, 7·21
Puccinia hordei (brown rust), on wheat, 254
Puccinia striiformis (yellow rust), on wheat, 135, 254, 7·12
 Pygmy beetle (*Atomaria linearis*). *See* Beetles
 Pyrazine, reactions of copper with, 11·3
 Pyrazone, as herbicide in sugar beet, 261, 276
 Pyrethrins, 172, 173, 9·3, 9·14, 9·15
 Pyrethroids
 acyclic, 170

INDEX

Numbers in italics refer to the Abstracts of Papers on pp. 318-375.

- Pyrethroids (*contd.*):
 photostable, 167, 168, 169, 9·12, 9·13
 resistance of housefly to, 174
 structure-toxicity relationships of, 168
 synthetic, 167, 168, 169, 9·11
 Pyritic soils, ochre formation in field drains in, 3·12
Pythium spp.
 effect of pesticides on, in beans, 141
 on barley, 131
 on wheat roots, 134
o-Quinones, modification of viruses by, 110
 Quintozene, for control of potato scab, 187, 188, 9·23
 Radiocarbon dating of soil organic matter, 75
 'Reference Plots' experiment, at Boxworth Experimental Husbandry Farm, 59
 Residual Phosphate Rotation experiments, 242, 244
 Resmethrin ('NRDC 104'), 169, 174, 9·15
Rhizobium spp.
 effect of casein hydrolysate on, 83
 effect of yeast extract on, 83
 International Biological Programme catalogue of strains, 83, 4·2
 reduction of dye, Nile Blue, by, 82
 selective medium for, 82
Rhizoctonia solani
 effect of pesticides on, in beans, 141
 in cereals, 136
 on potatoes, 146, 148, 7·10
Rhynchosporium secalis, on barley, 126
 Ribonucleases
 affinity chromatography of, 6·13
 in leaf extracts treated with phenol, 6·16
 purification of, 6·14
 Ribonucleic acid, of viruses, 117, 119
 Ribulose diphosphate carboxylase, photosynthesis of wheat and, 91, 93
 Rice, brown sheath rot of, 118
 River Trent, soil pollution by flood waters, 72
 Root-nodule bacteria, infection of clover by, 79, 8·3
 Rosemaund Experimental Husbandry Farm, 125
 Rotations
 at Rothamsted farm, 249
 at Woburn farm, 253
 Rothamsted
 cereal growth and yield compared with Broom's Barn, 43, 49, 278
 weather at, 248, 378, 1·1, 1·4
 Rothamsted Insect Survey, 193, 220, 222, 10·21
 'Rotostat' seed treater, 177, 178
Rumex spp. (Docks), in grass, 251
Saccharomyces cerevisiae, virus infection of proto-plasts of, 7·6
 Saddle gall midge (*Haplodiplosis equestris*), 180
 Salts in soil, movement of, 40
 'Sandoz 52.133', as fungicide on wheat, 7·13
 Saponite-like mineral from South Africa, 70
 Saxmundham
 cereals at, 43, 48
 weather at, 381
 Scanning electron microscopy
 of nematodes, 149, 150, 151
 of Symphyla, 10·19
 preparation of nematodes for, 151
Sclerotinia rot of clover, 138
 Seale Hayne Agricultural College, 125
 Selenium, estimation of plant-available, 3·13
Septoria nodorum (leaf spot), on wheat, 189, 250, 254
 Serine
 enzymic synthesis from glycine, 91
 in leaves of pea plants, 111
 in sugar beet, 100
 metabolism in leaves, 92
 Sewage sludge
 aerobic and anaerobic incubation of, 77
 toxic metals in, 77
 Sheep diseases caused by mouldy hay, 121
 Shropshire, soil survey in, 295
 Silage
 algal growth in effluent, 62
 formic/propionic acid additive for, 252
 Simazine, effect on beans, 250, 251, 254
 Slugs
 activity of, 16·15
 in potatoes, 206, 251
 Sodium
 effect on soil structure, 268
 effect on soluble carbohydrates in grass, 2·25, 2·26
 effect on sugar beet, 268, 269, 270, 5·8, 16·18, 16·19
 in British and Malayan soils, 2·16
 replacement of K by, 268, 2·25, 2·26
 silicate of soda, for barley, 241
 Soil bacteria, 4·9
 Soil biomass, 76
 Soil cations in size fractions of soils, 2·16
 Soil classification, 287, 304, 17·9, 17·21
 Soil clays, 67-72
See also Soil mineralogy
 Soil compaction
 effect on nematodes, 275
 effect on sugar-beet yield, 275
 in pastures, 312
 Soil fauna
 arthropods, 205
 cutworms, 194, 203
 earthworms, 180, 204, 205, 10·34
 effect of pesticides on, 180, 201, 204, 205, 10·8, 10·12, 10·35, 10·37
 effect of stubble burning on, 205
 effect of temperature and moisture on, 206
 slugs, 206, 251, 16·15
 vertical distribution of, 206
See also Earthworms
 Soil fumigation. *See* Soil sterilisation
 Soil geochemistry, 72
 Soil mapping
 air photography for, 310
 national soil map of England and Wales, 311
 Soil mineralogy
 clay mineralogy of Nile-Delta sediments, 71
 determination by X-ray diffraction, 307
 effect of heating on specific surface area, 70
 interlayering in soils and clays, 67
 interstratified expanding clay mineral, 68
 mixed-layer montmorillonite-chlorite, 69
 of Western State, Nigeria, 69
 pretreatments for dispersing clay, 68
 saponite-like mineral, 70
 Soil moisture
 cereal growth and, 90, 123, 16·25
 effect on sugar beet, 16·17, 16·18, 16·19, 16·25
 effect on take-all in wheat, 123
 plant response to N fertiliser and, 123
 root growth and, 16·25
 water/air regimes, 305
 Soil nutrient potential, 2·9
 Soil organic matter
 age of, 76
 cumulative effect on crop yields on light soils, 2·13
 effect on boron content of crops, 61
 effect on K-Ca exchange in soil, 59
 effect on P adsorption by calcareous soils, 58
 mobilisation of Mo, V and U by, 3·3
 radiocarbon dating of, 75
 Soil respiration, 41
 Soil salinity, crop growth and, 59
 Soil sterilisation
 by gamma radiation, 76
 effect of sulphur dioxide on photosynthesis, 98
 effect on decomposition of plant material, 76
 effect on nematodes, 150, 157, 278, 8·16
 effect on potato senescence, 157
 effect on sugar beet, 278, 16·4, 16·26
See also names of chemicals used as sterilants
 Soil structure
 damage to, during sugar-beet harvesting, 275
 effect of sodium and potassium fertilisers on, 268
 instruments for studying, 41

Numbers in italics refer to the Abstracts of Papers on pp. 318–375.

INDEX

- Soil structure (*contd.*):
 microstructure, 307
 preparation of clay soils for determining, 3·8
- Soil Survey of England and Wales
 national soil map (1 : 1,000,000), 311
 new soil classification, 283, 311
- Soil surveying
 air photography and, 310, 17·24
 indexing of data, 17·30
 terrain evaluation, 17·22
- Soil surveys
 Avon, 299
 Berkshire, 297
 Cambridgeshire, 291
 Cheshire, 283
 Clwyd, 301
 Cornwall, 299
 Cumbria, 286
 Derbyshire, 293
 Devonshire, 300
 Dyfed, 303
 Essex, 297
 Herefordshire, 295
 Kent, 298
 Lincolnshire, 293
 Norfolk, 291
 Northumberland, 290
 Nottinghamshire, 294
 Oxfordshire, 299
 Pembrokeshire, 303
 Shropshire, 295
 Staffordshire, 295, 296
 Suffolk, 292
 Wiltshire, 301
 Worcestershire, 295
 Yorkshire, 290
- Soil temperature, infrared linescan imagery for recording, 311
- Soil water potentials, 99
- Solanum multidissectum*, 153
- Solanum tuberosum* ssp. *andigena*, 149, 154
- Solar radiation, for plant growth, 40, 1·7, 1·8, 1·9
- Solomon Islands, virus diseases in, 118, 7·11
- South Africa, saponite-like mineral from, 70
- Soyabean
 effect of type of illumination on, 85
 mycorrhiza in, 82
- Specific surface area of soils, effect of heating on, 70
- Spinach, rate of sucrose synthesis in, 93
- Spindle tree (*Euonymus europaeus*)
 as host for aphids, 185, 196, 197, 263, 8·22
 nematodes on, 8·22
- Spongospora subterranea*, on potato, 148
- 'Spontox' (2,4,5-T with 2,4-D), to control nettles, 255
- Spore traps, 126
- Sporobolomyces* spp. on wheat, fungicides for, 7·13
- Staffordshire
 mineralogy of soils, 307
 soil survey in, 295, 296
- Statistical analysis
 analysis of covariance of photosynthesis, 90
 cluster analysis, 221, 228
 fertiliser practice surveys, 222
 for foliar diseases of cereals, 223
 for groups of experiments, 221
 for livestock, 221
 for milk, keeping quality of, 222
 for seed-tuber diseases of potatoes, 223
 for weeds, 223
 multidimensional scaling, 220
 multivariate, 220, 224, 226
 of epidemiological data, 12·18
 pesticide surveys, 223
 principal coordinate analysis, 73
 probit analysis, 220
 Procrustes method, 224
 Rothamsted Insect Survey, 222
 routine analyses, 223
 surveys, 222
 User's Guides, 226, 12·2, 12·3, 12·6, 12·9
- Statistical programming
 CALCULATE directive, 225
 cluster analysis, 221, 228
 diagnostic keys, 224, 228, 12·21
 'FUNCTION' directive, 227
 General Survey Program, 226
 Generalised Linear Interactive Modelling (GLIM), 227, 12·6
 Genkey, 228, 12·21
 GENSTAT, 223, 224, 225, 226, 227, 12·6, 12·20
 HIERARCHY directive, 225
 identification techniques, 12·24
 latent roots and vectors, 12·25, 12·26
 Maximum Likelihood Program, 227
 mixed-up values in experiments, 12·22
 multivariate data, 220, 224, 226
 Numerical Algorithms Group Project, 227
 structure formulae, 12·23
- Statistical theory
 analysis of variance, 225, 12·28
 classification problems, 12·13, 12·14
 diagnostic keys, 224, 228, 12·21
 documentation, 226
 fertilisers, field experiments with, 12·11
 inference, 223
 language, 226, 12·6
 multivariate analysis, 220, 224, 226
 non-linear models, 223
 Procrustes method, 224
 quasi-likelihoods, 225
 relative abundance of species, 225
 soil-nutrient sampling, 12·12, 12·19
 three-way grids, 12·15
- Stellaria media* (chickweed), in grass, 251
- Stomatal resistance in leaves, 39, 40
- Stored products
 flour moth (*Anagasta kuehniella*) in, 9·24
 fungus diseases of, 121
 pheromones of pests of, 9·24
- Storm run-off from roads, 72, 74, 75
- Streptomyces scabies*, on potato, 143, 148, 187, 188, 254, 9·23
- Stubble burning, effect on soil fauna, 205
- Suberosis caused by dust from cork factory, 122
- Sucrose synthesis, in leaves, 92, 5·6
- Suffolk
 soil survey in, 292
 soils over boulder clay in, 309
- Sugar beet
 aphid spray warnings, 256
 aphids on, 262, 263, 264
 bird repellants for, 260, 261, 16·22
 blackleg (*Aphanomyces cochlidioides*) on, 261
 bolters, 276
 boron deficiency in, 45, 60, 270
 caging against bird and mammal damage, 260
 copper for, 270
 cytokinins in sap, 101
 damage to soil during harvesting, 275
 defoliation, artificial, 260
 Docking disorder, 265, 16·4, 16·16, 16·17, 16·26
 downy mildew on, 266
 effect of atmospheric humidity on, 5·7
 effect of light and temperature on, 5·11
 effect of Na and K on seedlings, 268, 269, 270
 effect of *Polymyxa betae* on, 124
 effect of soil compaction on yield, 275
 effect of soil fumigation on, 278, 16·4, 16·26
 effect of soil moisture on, 16·17, 16·18, 16·19, 16·25
 effect of soil salinity on, 59
 effect of trace elements on, 263, 269
 EMP (ethylmercuric phosphate) steep for, 261, 262
 endogenous growth substances in, 101
 fertilisers for, 268–271, 278
 foliage-feeding pests of, 256
 footrot, 266
 frequency of beet and barley, 277
 fungus diseases, 261, 264, 265, 266

INDEX

Numbers in italics refer to the Abstracts of Papers on pp. 318–375

- Sugar beet (*contd.*):
 germination, 271
 grazing of seedlings by birds, 260, 16·22
 gibberellin-like substances in, 101
 green manuring, 274
 growth in controlled environment, 99
 growth regulators for, 100, 101, 267, 276
 heart rot, 60
 herbicides for, 261
 irrigation for, 266, 267, 271, 272, 16·18, 16·19, 16·27
 isobutylidene diurea for, 274
 magnesium deficiency and fertilisers for, 45, 262, 270, 271, 2·17
 manganese for, 262, 269, 16·20
 millepedes in, 257, 258, 16·23
 monogerm and polyploid seed, 267, 273, 276
 nematodes in, 162, 265, 16·16, 16·17, 16·24, 16·26
 nitrogen fertilisers for, 267, 268, 270, 271, 277, 278, 16·21, 16·27, 16·28
 on ridges, 273
 pest aggregation in, 257
Phoma betae on, 261
 plant density, 272, 273, 16·18, 16·19
Polymyxa betae in, 124
 potassium fertilisers for, 268, 269, 16·18, 16·19
 powdery mildew on, 262, 263, 264
 pygmy beetles in, 256, 258, 261, 16·23
 'Rhizomania' in, 124
 root growth related to soil moisture, 16·25
 root-feeding pests, 258
 rotations with cereals, 276–280
 seed production, 266, 16·29
 seed quality, 16·30
 seed storage, 267
 seedbed preparation, 273
 seedling pests and diseases, 256–262
 sodium fertilisers for, 268, 269, 270, 5·8, 16·18, 16·19
 soil pests, 257
 storage root, development of, 5·10
 symphylids in, 258
 time of sowing and harvesting, 273, 16·21
 violet root rot, 265
 virus diseases of, 118, 255, 260, 262, 266, 276, 16·26, 16·27
 water relationships, 98
 water stress in, 99, 5·8
 weeds in, 249
 wilting of, 98
 wireworms in, 258
 yields, 162, 250, 255, 258, 260, 270, 272, 273, 274, 276, 277
- Sugar cane, streak disease of, 118
- Sugar-cane bagasse
 microflora of, 121
 moulding of, 7·16
- Sulphur
 in plant material, methods of determining, 2·18, 3·4
 in soils and herbage in Pembrokeshire, 74
 in wheat on Broadbalk, 51
 pollution from brickfields, 96
 seasonal variation in uptake by plants, 75
 uptake by barley, 97
 uptake by groundnuts, 2·21
- Swedes
 effect on mycorrhiza in onion, 81
 P fertilisers for, 45, 56, 57
 yields, 56, 57
- Symbiosis in legumes
 effect of inoculation, temperature and N fertiliser on, 84
 genetics of increasing effectiveness, 79
- Symphyla, scanning electron microscopy of, 10·19
- Take-all (*Gaeumannomyces graminis*) on cereals
Agrostis gigantea, as host, 132
 bacteria, inhibitory, in soil and debris, 130
 brown sheath rot of rice and, 118
- Take-all on cereals (*contd.*):
 decline of, 79, 128
 effect of cropping on, 130
 effect of cultivation on, 135
 effect of fallow on, 123
 effect of fertilisers on, 79, 131, 132
 effect of *Phialophora radicola* on, 131
 effect on nutrient uptake of wheat, 123
 microbial populations and nitrogen in soils with, 4·7, 7·18
 straw disposal and, 135
 Take-all Experiment, 132
 transmissible inhibition of, 129
 virus-like particles in, 118, 7·22
- 'Talcord' (thiocarboxime)
 as nematocide, 161
 for slugs in potatoes, 206
- Tarophagus proserpina*, as virus vector, 118
- 'Telone', as nematocide, 161, 8·26, 16·16
- Terbutryne ('Prebane'), for control of blackgrass, 106, 249
- Tetrachlorvinphos, resistance of housefly to, 173, 174
- Tetradifon, effect on earthworms, 204
- Thallium ascorbate, 217, 11·7
- Thermoactinomyces vulgaris*, in mouldy hay, 121
- Thiabendazole
 as fungicide on potato, 145, 146, 147, 9·33
 as nematocide, 161
- Thiocarboxime. *See* 'Talcord'
- Thionazin, for control of saddle gall midge, 180
- Thiophanate methyl
 as fungicide on cereals, 178, 7·13
 effect on mycorrhiza, 81
- Thrips, 10·1
- Tillage. *See* Cultivation
- Tipula paludosa*, pathogens of, 10·2
- Tobacco, virus diseases of, 116, 117, 7·5, 7·6, 16·26
- Tomato
 blackring virus of, 16·26
 potato-cyst nematodes on, 160
- Trace elements
 drainage and soil content of, 74
 effect on sugar beet, 263, 269
 in Denchworth soil series, 73
 in Pembrokeshire soils, 74, 312
 in road run-off water, 72, 74
 in soil developed on loess, 3·10
 in wheat, 51
 mobilisation of Mo, V and U by organic matter, 3·3
 soil pollution with, by flood waters, 72
See also names of individual trace elements
- Transpiration, measurement in canopy enclosures, 40
- Trent River Authority, 72
- Trichlorophon, resistance of housefly to, 173
- Tridemorph ('Calixin')
 applied with liquid fertiliser to wheat, 55
 as fungicide on cereals, 55, 120, 126, 127, 250, 254, 280, 7·13
- Trifolium pratense*, root organ cultures of, 81
- Triforene, as fungicide on cereals, 7·13
- Triphenyltin hydroxide, for controlling *Phoma betae* in sugar beet, 261
- Tryptophan, in wheat leaves, 5·12
- Tsuga heterophylla*, 2·15
- 'U-12171', for pests in sugar beet, 261
- UDP glucose-fructosephosphate glucosyltransferase, 92
- UDP glucose pyrophosphorylase, 93
- Uganda
 cotton experiments in, 228
 soil-fertility experiments in, 229
 tuberculin reactions in cattle, 229
- Uranium, mobilisation and fixation of, by plant matter, 3·3
- Urea
 compared with aqueous ammonia, 44, 53
 compared with 'Nitro-Chalk', 54, 55
 in liquid fertilisers, 44, 51, 54
 nitrification of, 41, 52

Numbers in italics refer to the Abstracts of Papers on pp. 318–375.

INDEX

- Urea (*contd.*)
 risk to germination of barley, 44, 51
 sulphur-coated, 43, 44, 48, 52, 53
Ustilago nuda, on barley, 190
- Vanadium, mobilisation and fixation of, by plant matter, 3·3
- Verticillium dahliae*, on potato, 150, 159, 7·2, 8·8
Verticillium lecanii, in dust during harvesting, 121
- Vesicular-arbuscular mycorrhiza, 79, 80, 81, 4·1, 4·5, 4·6
- Vigna* spp., 85
- Viruses
 aggregates in plants, 7·20
 Animal Virus Research Institute, Pirbright, 210
 aphid transmitted, 117, 118, 124, 137, 139, 141, 7·8, 7·9, 7·19, 10·38
 effect of date of sowing cereals on infection, 125
 effect of manganese sulphate on, 262
 effect of pesticides on, 140
 effect of spacing, N fertiliser and irrigation on, 16·27
 effect of trace elements on spread of, 262, 263
 effect of weather on, 262
 electron microscopy of, 118, 137
 genetic complementation between, 7·14
 heat therapy of infected seed, 140
 hopper transmitted, 118, 137
 Hymenoptera and, 10·3
 in beans, 139, 246
 in cereals, 118, 124, 135, 137, 138, 7·19
 in grasses, 136
 in insects, 192, 209, 10·23, 10·24
 in mosquitoes, 210
 in moths, 210
 in potatoes, 110, 117, 147, 148, 7·8, 7·9, 7·20, 10·38
 in suckling mice, 210
 in sugar beet, 255, 260, 262, 266, 276, 16·26, 16·27
 in tobacco, 116, 117, 7·5, 7·6, 16·26
 in tropical crops, 118
 infection of protoplasts with, 116, 7·5, 7·6
 isopycnic banding of, 7·24
 invertebrate control by, 10·3, 10·4
 mealy-bug transmitted, 118
 mite-transmitted, 136, 7·20
 modification by *o*-quinones, 110
 nematode-transmitted, 16·26
 picornaviruses, 10·24
 pin wheels and, 7·20
 pollen transmission and, 140
 protein of, 117, 7·14
 protoplast preparation for virus infection, 116
 protoplasts, infection with, 7·5, 7·6
 purification of, 118
 resistance mechanism in plants to, 117
 ribonucleic acid of, 117, 119
 seed-borne, 137, 140, 246
 spread by grass-cutting machinery, 136
Tarophagus proserpina, as vector, 118
 transmission, component for, 117
 transmitted by *Olpidium brassicae*, 8·22
 'viroplasm', 7·11
 virus-like particles, 118, 7·11, 7·21, 7·22
 weevil-transmitted, 139, 140, 246
- Viruses, names of
 acute bee paralysis, 210, 10·24
 alfalfa mosaic, 117
 Arkansas bee virus, 209
 barley yellow dwarf, 124, 125, 135, 138, 7·19
 bean leaf roll, 139
 bean yellow mosaic, 139
 bee virus X, 209
 beet mild yellows, 262, 276
 beet yellows, 255, 256, 262, 263, 266, 276, 16·27
 broad bean stain, 139, 140, 246, 251
 broad bean true mosaic, 139, 140, 246
 broad bean wilt, 7·23
 chronic bee paralysis, 210
- Viruses (*contd.*):
 cocksfoot mild mosaic, 137
 cowpea mosaic, 7·14
 cucumber mosaic, 117
 Echte Ackerbohnenmosaik, 139, 140, 246
 euonymus mosaic, 8·22
 festuca mottle, 137
 henbane mosaic, 117
 kale virus, 7·14
 leaf drop streak, 148
 maize streak, 118
 nasturtium mosaic, 7·23
 nasturtium ringspot, 7·23
 necrotic streak, 137
 Nodamura, 192, 210, 10·23
 oat sterile dwarf, 137
 parsley virus 3, 7·23
 pea mosaic, 139
 potato aucuba mosaic, 117, 7·9
 potato X, 110, 117
 potato Y, 111, 117, 148, 7·9, 7·20
 radish mosaic, 7·14, 7·24
 Ringmosaik der Kapuzinerkresse, 7·23
 ryegrass bacilliform, 136
 ryegrass mosaic, 116, 136, 137, 138, 7·20
 ryegrass spherical, 137
 sacbrood of bees, 10·24
 severe etch, 117
 'speckled yellows', 262
 tobacco mosaic, 116, 117, 7·5, 7·6
 tobacco necrosis, 117
 tobacco rattle, 16·26
 tomato blackring, 16·26
 toproll, 147, 7·8, 10·38
 turnip virus, 7·14
- Wantage, soils of, 17·7
- Water contamination from motorways, 72
 Water potential in leaves and roots, 41, 98, 99
 Water retention by field soils, 17·29
 Water stress, in sugar beet, 99, 5·8
 Water use, by crops, 38
 Weed Research Organisation, Oxfordshire, 159, 223
- Weeds
 biology of perennial, 102
 chickweed (*Stellaria media*), 251
 competition with wheat, 103, 106
 Cultivation-Weedkiller experiment, 250
 docks (*Rumex* spp.), 251, 255
 on Broadbalk, 106, 249
 wild oats, 106, 249, 253
See also Agropyron; Agrostis; Alopecurus; Equisetum; Wild oats
- Weevils
 caught in suction traps, 140
 effect of pesticides on, 140, 207
 in beans, 139–141, 207, 246
 virus-transmitting, 139, 140, 246
- Wheat
 aminoacyl-tRNA synthesis in, 6·17
 apical meristem development, 51
 at Saxmundham, 43, 44, 48
 brown rust (*Puccinia hordei*) on, 254
 carbohydrate metabolism in, 88
 carbon compounds in metabolism, 92
 cytokinin in grain and leaves, 94, 5·12
 effect of atmospheric humidity on, 5·7
 effect of farmyard manure on, 50, 239
 effect of herbicides on, 106
 effect of liquid fungicides on, 179
 effect of seed rate and row width on, 48
 effect of temperature on grain growth, 93
 enzyme systems in, 88, 91
 fungus diseases on, 130, 134, 135, 220, 250, 254, 7·12, 7·13
 gibberellic acid in grain, 93
 growth substance distribution in leaves, 93, 5·12
 inflorescence development, 51
 leaf spot (*Septoria nodorum*) on, 189, 250, 254
 liquid fertiliser and fungicide applied to, 54

INDEX

Numbers in italics refer to the Abstracts of Papers on pp. 318–375.

- Wheat (*contd.*):
magnesium fertiliser for, 2·17
mercury/dieldrin dressing for, 250, 254
micronutrients in, 51
N fertilisers for, 48, 89, 158, 239, 250
nitrate concentrations in leaves and stems, 49
nutrient and water uptake by, 123
on Broadbalk, 50, 51, 239
Phialophora radiculicola on, 131, 134
Polymyxa graminis on roots, 134
potassium and nitrate in root zone, 2·24
root and shoot growth of, 5·9
root systems, 94
rotations, 239, 279
senescence in, 93, 96
sowing rate and yield, 89, 90
spikelet numbers, 51
starch accumulation, effect of growth substances on, 94
sucrose synthesis in, rate of, 92
sulphur deficiency in, 51
weed competition with, 103–107
wheat bulb fly on, 181, 198, 9·32
yellow rust (*Puccinia striiformis*) on, 135, 254, 7·12
yields, 49, 50, 51, 239, 240, 241, 250, 254, 278, 279, 305
See also Cereals; Eyespot; Take-all
- Wheat bulb fly (*Leptohylemyia coarctata*)
beetles as predators, 200
chemical control of, 180
effect of cereal exudates on, 181, 9·32
effect of charcoal and composts on, 182
egg mortality, 10·48, 10·49
egg populations, fluctuations in, 200, 220, 12·16
Entomophthora spp. on, 199, 10·55, 12·27
flight activity of adults, 199
hosts of, 200
in wheat and fallow, 199, 9·32
maturation of ovaries, 199
population studies, 198, 200
- Wild oats (*Avena fatua*), 106, 249, 253
- Wiltshire
shallow soils over chalk in, 308
soil survey in, 301
- Wireworms, in sugar beet, 258
- Woburn
aerial pollution from brickfields, 96
boron deficiencies at, 45, 60
'break' crops for cereals at, 253
cereals at, 44, 239–241, 253, 254
Conifer Reference experiments at, 2·10
cultivation at, 41
effect of weather on crops at, 252
Intensive Cereals experiment at, 241, 242, 245
Ley-Arable experiment at, 239, 244
magnesium deficiency at, 45, 60
magnesium for beet, potatoes and wheat at, 2·17
Organic Manuring experiment at, 61, 2·12, 2·13
rotations at, 253
weather at, 252, 379
- Worcestershire, soil survey in, 295
- X-ray diffraction, 67, 68, 69, 70, 307
X-ray fluorescence analysis, 73, 74, 2·18, 3·4
X-ray powder diffraction, 216
- Yeast, virus infection of protoplasts of, 7·6
- Yorkshire
loess in soils of, 71
reconnaissance survey of soils in Pennines, 310
soil survey in, 290
soils of, 17·6, 17·8
- Zambia
fertiliser experiments in, 228
tree-species groupings in, 228
- Zearalenone, 116, 121
- Zeatin, 94
- Zinc, in wheat, on Broadbalk, 51