

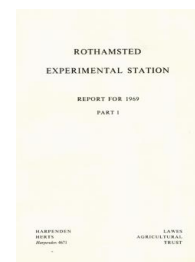
Thank you for using eradoc, a platform to publish electronic copies of the Rothamsted Documents. Your requested document has been scanned from original documents. If you find this document is not readable, or you suspect there are some problems, please let us know and we will correct that.



ROTHAMSTED
RESEARCH

Report for 1969 - Part 1

[Full Table of Content](#)



Index

Rothamsted Research

Rothamsted Research (1970) *Index ; Report For 1969 - Part 1*, pp 447 - 462 - **DOI:**
<https://doi.org/10.23637/ERADOC-1-124>

SUBJECT INDEX

Numbers in *italics* refer to the Abstracts of Papers on pp. 362–428. The General Report by the Director (pp. 23–30) has not been indexed.

- Aedes aegypti*
toxicity of synthetic pyrethroids to, 214
- Agmatine
accumulation in K-deficient crops, 41
- Agricultural meteorology, 36
- Agriotes* spp. *See* Wireworms
- Agropyron repens*. *See* Couch grass
- Agrostis gigantea*, 122–124
- Air conductivity in soils, 355
- Air pollutants at Woburn, 174
- Aldicarb ('Temik')
as aphicide on sugar beet, 309
as nematocide, 171, 190, 191, 198–203, 317, 322
- Aldrin
as liquid seed dressing, 225
determination of on seeds, 225
effect on soil microarthropods, 10·19
persistence in soil, 231
- Alizarin Red S for determining aluminium, 92
- Alopecurus myosuroides*. *See* Blackgrass
- Aluminium in clay minerals
determination of, 92
- Aluminium in soil, 65
- Aluminium phosphide
as fumigant for nematodes, 203
- Aluminosilicates, surface area of, 2·26
- Amino acids in grass, effect of potassium and sodium on, 55
- Ammonia, anhydrous
compared with ammonium nitrate and aqueous ammonia, 42–45
compared with liquid and solid fertiliser for sugar beet, 16·18
reactions with soil, 44
spacings between injections, 44
- Ammonia, aqueous
compared with anhydrous ammonia and ammonium nitrate, 42–45
for barley, 45
for grass, 42–44
- Ammonium nitrate
compared with anhydrous ammonia and urea, 41, 2·28
- Anopheles stephensi*
toxicity of synthetic pyrethroids to, 214
- Anthocyanins in conifer seedlings, 88
- Anti-locust Research Centre, 241
- Aphicides
aldicarb on sugar beet, 309
demeton-S-methyl, 231, 309, 312
menazon, 147, 149, 309, 310
'Metasystox', 150, 233, 301
methomyl ('Lannate'), 310
phorate granules on beans, 231
See also Insecticides
- Aphidius matricariae*
parasite on aphids, 237
- Aphids
black bean, 236
bulletin on catches in traps, 237
cannibalism, 10·1
cereal aphids, 236–240
counts transformation of, 10·37
dates of first appearance, 238
ecology of, 236
effect of light and temperature on take-off, 10·18
Entomophthora on, 11·16, 16·14
feeding, 9·7
infestation warning, 240
leaf-curling plum aphid, 235
migration, 237
multiplication, 150, 223, 9·7, 10·13
on carrots, 147
on field beans, 231, 236, 243, 301
on lucerne, 233, 235
on peas, 233
on potatoes, 235
on red clover, 235
on sugar beet, 235, 308
on weeds in sugar beet, 310
parasites and predators, 149, 237, 311, 10·1, 16·7, 16·21
phenology, 148
predicting outbreaks of, 236
resistant to insecticides, 9·11, 9·29
sampling methods, 236, 243, 10·11
surveys, 236
susceptibility to rogor, 223
technology of, 10·8
tree aphids, 238
virus diseases and, 147, 233, 235
- Aphids, specific names of
Acyrtosiphon pisum, 233, 234, 235, 236, 262
Aphis craccivora, 143, 235
Aphis fabae, 143, 231, 235, 236, 238, 243, 262, 301, 308, 309, 310, 311, 9·7, 10·13, 10·37
Aphis franguli, 238
Aphis nasturtii, 238
Brachycaudus heliochrysi, 235
Cavariella aegopodii, 147, 235, 238, 311
Drepanosiphum platanoidis, 238
Elatobium abietinum, 238
Euceraphis punctipennis, 238
Macrosiphum euphorbiae, 235, 302
Metopolophium dirhodum, 148, 236
Metopolophium festucae, 150
Myzocallis spp., 238
Myzus ascalonicus, 235
Myzus circumflexus, 150
Myzus persicae, 143, 144, 223, 224, 234, 235, 310, 311, 9·11
Rhopalosiphum padi, 148, 149, 150, 236
Sitobion avenae, 148, 149, 150, 236
Sitobion fragariae, 148, 236
Apis mellifera. *See* Honeybees
- Arable Reference plots at Rothamsted and Woburn, 250
- Army worm (*Spodoptera exempta*), 241
- Aromatic compounds
microbial degradation of, 99
- Arthur Rickwood Experimental Husbandry Farm, Mepal, nematocide trials at, 202
- Arvicola*, taxonomy of 12·6
- Atrazine
residual effect on crops, 293

INDEX

Numbers in italics refer to the Abstracts of Papers on pp. 362–428.

- Aureofungin**
effect on take-all in wheat, 161
Auxin in wheat, 98
Avena fatua. See Wild oats
Azinphos-methyl, poisoning of honeybees by, 218
Azotobacter spp., 98, 99, 4·2, 4·19
- B9**
effect on beans, 293, 14·2, 14·3
effect on potato, 117
BABT (2-n-butylamido-5-bromothiazole), effect on plant growth, 120
Bacteriophage of *Rhizobium*, temperate and virulent phages, 103
Bagassosis, 172
Barley
competition with wild oats, 120
effect of beet residues on, 335
effect of 'D-D' on yield, 317
effect of ethirimol on yield, 46, 152
effect of IBDU on, 46
effect of trace elements on, 56
fertilisers for, 45, 46, 47, 51
irrigation for, 36, 1·11
leaf analysis for, 51
Mexican dwarf varieties, 150
nematodes on, 190, 194
on Cultivation-Weedkiller Rotation Experiment, 287, 299
residual and cumulative effect of superphosphate on, 53
root growth of, 109
Survey of Foliar Diseases, 269
variety resistant to *Heterodera*, 194
viruses and aphids on, 149
yields, 286–289, 301
See also Cereals; Take-all
- Barnfield**
age of soil carbon in drain gauges, 85
beans on, 67, 162, 234, 283, 289
organic P in soils, 61
revised cropping on, 298
yields on, 283, 284, 289
- Bean weevil (*Sitona lineatus*)**
effect of dieldrin on, 232
virus transmission by, 234
- Beans**. See Field beans
Bees. See Honeybees, Bumblebees
Beetles, effect of insecticides on, 246
Benomyl
as fungicide on potatoes, 167, 168, 198, 229
as fungicide on sugar-beet seedlings, 314
compared with organo-mercurial fungicide, 166
for take-all on wheat, 159, 230
Berkshire, soil survey in, 347
- BHC**
as seed dressing, 225, 227
as soil insecticide, 314
determination of on seeds, 225
poisoning of honeybees by, 218
- 'Bidrin'**
nematicidal activity of, 203
- Blackgrass (*Alopecurus myosuroides*)**
ergot (*Claviceps purpurea*) on, 125
germination and viability of seeds, 121
plants from seed of different origins, 122
'Prebane' to control, 298
pre-emergence spraying with terbutryne, 125
twist (*Dilophospora alopecuri*) on, 125
- Bombus** spp. See Bumblebees
'Boots RD8502' as nematicide, 318
Botrytis, nematodes feeding on, 176
British Sugar Corporation, 313, 326
Broad bean, virus disease of, 234
- Broadbalk**
bromine residues after fumigation, 83
effect of fumigation on organic-matter mineralisation, 82
field experiments on, 282, 298
rotations, 282
trends in yields, 14·1
weeds on, 125
Wheat Bulb fly on, 252
yields on, 282, 284, 289, 298
Broadbalk Wilderness, organic P in soils, 61
Bumblebees (*Bombus* spp.)
egg eating by, 255
foraging behaviour of, 258
pollination of beans by, 11·13
sex- and species-specific compounds in, 207, 9·9
Buried soils, 76
Butt Close, 82
- C14421, nematicidal activity of, 203
Cabbage root fly, effect of insecticides on, 246
Calcium
colorimetric determination of in silicate minerals, 3·12
effect on crops in Reference Experiments, 56
Cambridgeshire, soil survey in, 341
Capsids, control of in Ghana, 10·24, 10·25
Captafol
as fungicide on sugar beet, 314
effect on potato scab, 229
Carbaryl for control of wireworms, 10·20
Carbon-dioxide measurement, 1·5, 1·6
Carbon disulphide as fumigant for nematodes, 203
Carbon in soil
effect of organic manures on, 60
Caribbean volcanic ash soils, 78
Carmarthenshire, soil survey in, 349
Carrot, nematodes feeding on, 176
Cation-exchange capacity of clays
determination of by X-ray fluorescence spectrometry, 90
CCC (chlormequat)
as seed dressing on wheat, 118
effect on beans, 14·2, 14·3
effect on cereals, 118, 5·6, 5·11, 7·20
effect on eyespot, 5·11, 7·20
effect on potato, 117
effect on sugar beet, 5·5
Cephalosporium sp. on potato, 171
Cercospora herpotrichoides. See Cereals, eyespot
Cereals
aphids on, 147, 236
break crops, 154, 300, 7·6
competition with weeds, 120, 124, 5·12
crop rotations and take-all, 154, 158
diseases in glasshouses, 153
diseases and pests at Rothamsted, 300
effect of CCC on, 118, 5·6, 5·11, 7·20
effects of frequent cropping on yields, 154
ergot (*Claviceps purpurea*) on, 300
eyespot (*Cercospora herpotrichoides*) on, 159, 161, 300, 5·11, 7·19, 7·20
fungicides on, 152, 153, 228, 335
fungus diseases, 108, 151–162, 300, 305, 7·19, 7·20
Fusarium spp. on, 7·19
irrigation for, 35, 36, 1·10
Erysiphe graminis on, 151, 153, 300, 305
nematodes in, 190, 194–198, 300, 8·7, 8·9, 8·14
on Broom's Barn farm, 334–336
physiology of yield, 5·3
powdery mildew on, 152, 153, 300, 305
Pythium spp. on, 7·19
Rhizoctonia solani on, 159

Numbers in italics refer to the Abstracts of Papers on pp. 362-428.

INDEX

- Cereals (*contd.*):
 root growth, 109
 soil fumigation, effects of, 162, 2-15, 7-19
 soil-borne diseases, 7-6
 take-all, 98, 154, 300, 7-19
 virus diseases on, 142, 144, 147-150
See also Barley; Maize; Oats; Wheat;
 Take-all
- Ceylon soils
 effect of Al on tea growth in, 65
 K : Al exchange in, 66
 organic P in, 62
- Cheshire, soil survey in, 341
- Chlordane
 effect on soil fauna, 160, 247
- Chlorfenvinphos
 against Wheat Bulb fly, 227
 as liquid seed dressing, 225
 as nematicide, 203
 effect on soil fauna, 256
 for control of wireworms, 10-20
 movement of in soil, 10-23
 persistence in natural waters, 10-17
- Chloride
 in sugar-beet tops and roots, 70
 methods of analysis in plants, 70
 residual effects in soil, 55
- (2-Chloroethyl) trimethyl ammonium chloride,
 effect on sugar beet, 5-5
- Chloroform vapour
 effect on mineralisation of soil organic matter,
 82
 effect on soil metabolism, 83
- Chlorophyll
 bleaching of, 128, 135
 breakdown of in leaves, 135
 in *Epipactis sessilifolia*, 136
- 6-Chloropicolinic acid, sorption of by soils, 69
- Chloropicrin, 162, 171, 190, 191
- Chloroxon, resistance of housefly to, 207
- Chlothion, resistance of housefly to, 207
- Chrysanthemum carinatum*, virus disease of, 235
- 'Ciba C10015', as seed and soil dressing, 313
- 'Ciba C14421' as nematicide, 318
- Classical Barley Experiment, barley yields on, 286
- Claviceps purpurea* (ergot) on cereals, 300
- Clay minerals
 K content of clay fractions, 80
 micromorphology, 77
 of N.A.A.S. Experimental Husbandry Farms,
 79
 of volcanic ash soils, 78
 semi-micro analysis of major elements, 92, 3-18
See also Mineralogy
- Clay soils, 80, 3-9
- Claycroft, 162
- Clostridium* spp., nitrogen fixation by, 100
- Clover
 copper in, 137
 effect of cold pretreatment on infection by
Rhizobium, 105
 irrigation for, 35, 1-10
 phyllody or witch's broom on, 147
 roots inoculated with *Rhizobium*, 104, 105
See also Trifolium
- Cockroach (*Periplaneta americana*)
 effect of pyrethrin on, 209
 haemolymph, pyrethrin content of, 210
 nervous systems of, 209, 210, 220
 staining of nervous system, 220
 tracheal system and insecticides, 210
- Cocoa (*Theobroma cacao*)
 analysis of experiments on, 270
 capsid control, 10-24, 10-25
 fungi found on beans, 173
 swollen shoot virus of, 146
- Coffee, fungi found on beans, 173
- Collembola
 caught in traps, 312
 effect on soil temperature on, 248
 molluscicides to control, 247
- Colombia, mineralogy of soils of Rio Cauca
 Valley, 3-2
- Computer performance
 experiments analysed, 273
 jobs run, 275, 276
 line transmission, 275
 measurements of, 273-277
 value of work, 273
See also Computers
- Computer programming
 Extended Mercury Autocode (E.M.A.), 277
 data logging, 278
 Fortran, 264, 278
 General Survey Program (G.S.P.), 268, 269,
 277
 graph plotting, 279
 simulation, 279
 translation E.M.A.-Fortran, 277
See also Computers
- Computers
 Edinburgh Regional Computing Centre
 (E.R.C.C.), 274-277
 equipment, 279
 Harwell (H.U.W.), 274
 multiaccess service, other institutes, 274, 278
 new computer, 272
 Newsletter, 280
 Orion, 264, 272, 281
 transmission data, 274
 University College London (U.C.L.), 274
See also Statistical analysis; Statistical
 programming
- Conifers
 anthocyanins in seedlings, 88
 copper deficiency in seedlings, 65
 forest growth, effect of N in nursery crops on,
 49
 K content and 'purpling', 88
 N fertilisers, effect on bud development, 50
 sulphur for, 2-3
See also Sitka spruce
- Controlled environments, 97, 125, 221
 liquid metering device, 220
 'Saxcil' cabinets, 143, 150, 156
- Copper
 deficiency in conifer seedlings, 65
 diamine oxidase for measuring, 128, 132, 138
 in clover seedlings, 137
 residues in soil from foliar sprays, 65
 mobilisation of by decomposing plant matter
 85, 3-3
- Copra, fungi found on, 173
- Coprosma robusta*
 culture of *Endogone* on, 97
 effect of mycorrhiza on, 95
- Cotton
 analysis of experiments on, 270
 effect of P fertiliser on yield, 2-17
 effects of defoliation on carbon dioxide trans-
 port in, 39
 mesophyll resistance in, 39
 respiration rates in, 38, 39
- Cotton bollworm (*Earias biplaga*), 241
- Cotton stainer. *See* *Dysdercus*
- Couch grass (*Agropyron repens*)
 competition with cereals, 124, 5-12
 dormancy of seeds, 122
 effect of N fertiliser on, 124
 effect of shading on, 124
 growth in Rothamsted and Woburn soils, 124
 paraquat on, 298

INDEX

Numbers in italics refer to the Abstracts of Papers on pp. 362–428.

- Couch grass (*Agropyron repens*) (*contd.*):
seed-production survey, 123
- Cropping
on Rothamsted farm, 300
on Woburn farm, 306
- Crops
composition of, 49
physiology of growth, 108
- Cultivation, effect on soil-invertebrate populations, 247
- Cultivation—Weedkiller Rotation Experiment, 286, 287, 289, 291, 299
- Cyclopropane carboxylic acids
preparation and resolution of, 213
- Cylindrocarpus* sp. on potato, 171
- Cytochrome C, catalytic activity of, 132
- Cytokinins, 116
- Dasyneura* spp.
gall formation, promoted by larvae of, 208
- Dazomet
as nematicide, 199–202, 294
residual effect on cereals, 162
- 'D-D'
as nematicide, 190, 194, 198, 199–203, 317–319
effect on soil microarthropods, 10·19
residual effect on cereals, 162
- DDT
effect on soil insects, 247, 314
resistance of housefly to, 208
- Demeton-S-methyl
as aphicide on sugar beet, 309, 312
as nematicide, 203
polarographic response of demeton, 222
- Derbyshire, soil survey in, 342
- Devonshire, soil survey in, 349
- 'Dexon', as fungicide for sugar beet seedlings, 314, 318
- Diazinon
as nematicide, 203, 318
effect on soil fauna, 160, 246, 314
for wireworm control, 10·20
metabolism of by housefly, 206
- Diazoxon
effect on cockroach, 210
metabolism of by housefly, 205
- Dibromochloropropane ('Nemagon'), as fumigant for nematodes, 203
- Dichlone as fungicide for sugar beet seedlings, 314
- Dichloropropene, effect on soil microarthropods, 10·19
- Dieldrin
effect on bean weevil, 232
factory trials with, 312
movement in soil, 10·21
poisoning of honeybees by, 218
seed applications, 313
volatilisation, 215
- Dimefox as nematicide, 203
- Dimethoate, uptake from solution by wheat, 221
- Dimlington silts, East Yorkshire, age of, 3·16
- Disulfoton
effect of environment on effectiveness, 221
for control of wireworms, 10·20
polarographic response of, 222
uptake from solution by wheat, 221
- Dithizone for determining zinc and lead, 93
- Docking disorder of sugar beet
acreage affected, 316
control with 'D-D', 198
effect of herbicide on, 198
effect of N fertiliser on, 16·6
effect of soil fumigation on, 319, 16·6
effect on sugar yield, 199
Herringswell Rotation Experiment, 316
- Docking disorder of sugar beet (*contd.*):
nematode survey of, 316
seed and row treatment with nematicides, 16·20
- Drainage water, nitrate lost in, 51, 52, 2·29
- 'Dursban'
insecticidal seed dressing, 313
insecticidal soil dressing, 314
nematicidal activity of, 203
- 'Dyfonate', effect on soil fauna, 246
- Dysdercus* spp., 207, 241, 9·10
- Earias biplaga* (cotton bollworm), 241
- Electron microscopy
of nematodes, 178
of *Rhizobium* cultures, 104, 4·4
of virus-infected tissues, 145–147, 259, 7·17
thin sections and negative staining, 7·17
- Ely, Isle of, soil survey in, 341
- EMP steep, as fungicide for sugar-beet seedlings, 313, 314
- Endogone*
culture of, 97
effect on plant growth, 95
fine structure, 97, 4·9
honey-coloured sessile spores, 97, 4·8, 4·9, 4·10
life history, 4·8
numbers in soil, 4·6
mycorrhiza, effect of temperature and light on, 97
vesicular-arbuscular mycorrhiza and, 4·6
wall structure, 4·10
- Endosulfan, poisoning of honey bees by, 219
- Endothion, nematicidal activity of, 203
- Endrin, 246
- Entomophthora* spp.
adaption to specific hosts, 262
effect of light and humidity on, 262
on aphids, 262, 11·16, 16·14
on scatophagid flies, 261, 262
on syrphid flies, 261
on Wheat Bulb fly, 261
sporulation on pea aphids, 11·16
- Enzymes
in leaves, 131
in rhizosphere of clover, 104
- Epipactis sessilifolia* (violet helleborine), chlorophyll in, 136
- Essex, soil survey in, 346
- Ethion, for control of Wheat Bulb fly, 227
- Ethirimol (PP 149), effect on barley yields, 46, 152, 335
- 'Ethrel'
effect on beans, 293
effect on oats, 119
effect on potato, 117
effect on sugar beet, 119
- Ethyl bromide, as fumigant for nematodes, 203
- Ethyl chlorthion, resistance of housefly to, 206, 207
- Ethyl malathion, resistance of housefly to, 207
- European Weed Research Council, 121
- Exhaustion Land, paraquat for couch grass on, 298
- Eyespot (*Cercospora herpotrichoides*). See Cereals, eyespot
- Farmyard manure
applied with NPK on Reference Experiments, 57
residues from, value of, 2·9, 2·10, 2·11, 2·14
- Fenitrothion for wireworm control, 10·20
- Fenthion as soil insecticide, 314
- Fertilisers
history of sites for long-period use of, 2·11
leaching of in lysimeters, 2·22

Numbers in italics refer to the Abstracts of Papers on pp. 362-428.

INDEX

- Fertilisers (*contd.*):
 NPK on barley and kale, 2-28
 on rotation crops, 334
 residues from beet, effect on barley, 335
 residues from long-period use of, 2-9, 2-10, 2-11, 2-12, 2-13
 Survey of Fertiliser Practice, 268
See also Names of individual fertilisers
- Field Beans (*Vicia faba*)
 aphids on, 231, 236, 243, 301
 effect of simazine on, 42, 67, 162, 299
 effect of soil fumigation on, 162, 294
 growth regulators on, 293, 14-2, 14-3
 irrigation for, 35, 1-11
 losses caused by bean weevil, 232
 'Metasystox' sprays for, 301
 nematodes on, 294, 299
 N fertilisers for, 14-2, 14-3
 nitrogen fixation in, 104, 105
 on Broom's Barn farm, 337
 on Cultivation-Weedkiller Rotation Experiment, 289, 299
 pollination by bees, 11-13
Pythium root rot on, 162
 systemic insecticides on, 221
 varieties, virus diseases on, 235
 virus diseases of, 234, 235
 wilting on, 162
 yields, 283, 284, 289, 301
- Fison's East of England Arable Units, soil map of, 359
- Flooded soils. *See* Waterlogged soils
- Fluorine as air pollutant, 174
- Fodder crops, on Broom's Barn farm, 337
- 'Folimat', nematocidal activity of, 203
- Forestry, nematode numbers in reference plots, 191-194
- Formaldehyde, 82, 83
- Formalin
 effect on cereals, 162, 2-15, 7-19
 effect on grass, 2-15
 effect on N content of soil, 2-15
 effect on nematode numbers in soil, 197, 8-21
 effect on soil microarthropods, 10-19
- Fosters Field
 barley on, 286
 potatoes on, 289
 wheat on, 285
- 'Frescon', to control liver fluke, 247
- Frit fly (*Oscinella frit*)
 effect of phorate on, 292, 10-28
 effect on weather on, 10-26
 on maize, 292, 10-28
 on oats, 10-27 10-29
 parathion for control of, 10-26
- Fumagillin, tested for control of chronic bee-paralysis virus, 259
- Fumigation. *See* Soil sterilisation
- Fungicides
 benzimidazoles, 166, 7-10
 benomyl, 159, 166, 168, 198, 230, 314
 for potatoes, 166, 229, 7-10, 9-26
 'Dexon' for sugar-beet seedlings, 314, 318
 dichlone for sugar beet, 314
 EMP steep, 313, 314
 ethirimol for barley, 46, 152, 153
 factory trials with, 313
 for sugar-beet seedlings, 314, 318
 mercury, assay of on wheat seeds, 226, 227
 organo-mercurial, 166
 organo-tin compounds, 228
 systemic, 46, 152
 'Vitavax'/organomercury compound, 300
- Fungus diseases
 bagassosis, 172
- Fungus diseases (*contd.*):
 on cereals, 98, 108, 151-162, 300, 305, 5-11, 7-19, 7-20
 on potatoes, 163-171, 198, 228-230, 7-1, 7-10, 7-11, 9-26
 on sugar beet, 314, 315, 16-1
 on weeds, 125
 on Wheat Bulb fly, 261
Fusarium caeruleum on potato, 163, 171
 Fuchsia, mycorrhiza on, 95
- Galleria mellonella*. *See* Wax moth
- Gamma-ray irradiation, effect on soil metabolism, 83
- Garden Clover, *Heterodera trifolii* on, 294
- Garden Plots
 fertilisers on, 292
 use of Orion computer for randomising experiments, 281
- 'Gardona' effect on soil fauna, 246
- Gas-liquid control valve, patent for, 220
- Gibberellin
 in wheat, 117
 production of by soil bacteria, 98
- 'Geigy GS 13006'
 as nematocide, 318
 as soil insecticide, 314
- Glasshouse experiments
 test plants for artificial lighting of, 70
 to supplement field experiments, 2-8
- Glaucanite in loess soils, 77
- Gloucestershire, soil survey, in, 348
- Glycine max.* *See* Soya bean
- Grass
 ammonia fertilisers for, 41, 42-44
 carbohydrate content of, 2-25
 effect of aldrin on, 231
 effect of nematodes on, 199
 effect of trace elements on, 56
 free amino-acid content of, 2-25
 IBP experiments with, 105
 irrigation for, 35, 1-10
 K fertilisers for, 41, 47-49, 54, 2-19, 2-25
 microplot experiments, 43
 mycorrhiza on, 95
 N fertilisers for, 47-49, 302, 2-25
 N residues in, 47
 'N-serve' on, 43
 nematode control in, 199
 non-protein nitrogen in, 49
 productivity, effect of pests on, 231
 uptake of available K by, 2-19
 yields, 59
- Grassland Research Institute, 231
- Great Field IV, residual and cumulative effect of superphosphate on, 53
- Great Harpenden Field, Wheat Bulb fly on, 252
- Great Hoos, paraquat for barley stubble on, 298
- Griseofulvin, nematocidal activity of, 203
- Growth analysis of spring wheat, 37
- Growth regulators, 98, 116-120, 293, 5-2, 5-4, 5-5, 14-2, 14-3
See also BABT; B9; CCC; 'Ethrel'; Morphactin
- Growth substances
 chlorophyll breakdown in leaves and, 135
 in wheat, 116
See also Auxin, Cytokinins, Gibberellin
- Gryllotalpa africana* (mole cricket), 241
- Harwoods Piece, take-all fluctuations on, 157
- Hawk moth (*Herse convolvuli*), 241
- Hay. *See* Mouldy hay
- Heliothis armigera*, 241
- Helminthosporium solani*, effect of fungicides on, 167

INDEX

Numbers in italics refer to the Abstracts of Papers on pp. 362–428.

- Heptachlor as soil insecticide, 314
- Herbicides
- 'Avadex BW' for wild oats, 300
 - 'Betanal', 299
 - chemical structure and sorption of, 68
 - diuron, inhibition of photosynthesis by, 129
 - microbial degradation of, 99
 - molecular structure of, 2·23
 - paraquat, 247, 298, 300
 - 'Prebane' to control blackgrass, 298
 - simazine, 42, 67, 162, 299
 - sorption of by soil, 68, 2·23
 - spray drift from, 333
 - terbutryne for blackgrass, 125
- Herefordshire, soil survey in, 343
- Herringswell Rotation Experiment, Broom's Barn, 47, 316, 318
- Herse convolvuli* (Hawk moth), 241
- Highfield, 285, 286, 289
- Honeybees (*Apis mellifera*)
- Acarapis woodi* on, 11·6
 - acute bee-paralysis virus, 259, 11·4
 - behaviour and physiology, 254, 11·2
 - chronic bee paralysis virus, 259, 11·6
 - contamination of wax with dichlorvos-resin strips, 218
 - denatured sucrose for feeding, 254
 - diseases and pests, 259
 - drone production, 255
 - European foulbrood, 11·7
 - field behaviour, 260
 - 'footprint' substance, 257, 11·8
 - foraging behaviour, 258, 11·11, 11·12, 12·7
 - hive space required, 11·14
 - hypopharyngeal glands, 142, 254, 260, 11·4
 - inhibitory power of queens, 256
 - invertase content of glands, 254
 - Malpighamoeba mellificae* on, 11·3, 11·6
 - mandibular-gland secretion, 256
 - Nassanoff glands, 256, 11·9
 - nest-entrance marking with pheromones, 11·8
 - Nosema apis*, infection by, 259, 11·3, 11·6
 - odour of food store, 11·11
 - organochlorine residues in, 218
 - parasites of, 11·3
 - pheromones of, 256, 11·1, 11·8
 - physiological cycle, 254
 - poisoning of by insecticides, 218, 9·2, 9·3
 - pollination of beans by, 11·13
 - queen confinement, piping and swarming, 254, 11·15
 - queen selection, 256
 - response to shape of flowers, 257
 - sacbrood virus, 142, 259, 11·4, 11·5
 - size of colony and foraging behaviour, 11·12, 12·7
 - smoking hives, effect on food in honey stomachs, 11·10
 - stinging, food in honey stomachs and, 11·10
 - Streptococcus pluton* and European foulbrood, 11·7
 - 'washboard dance', 260
 - wax-moth larvae on combs, 261
- Hoos Permanent Barley experiment
- yields on, 283, 284, 289
- Housefly. *See Musca domestica*
- Huntingdonshire, soil survey in, 342
- Hydrocarbons
- gas chromatography of, 99
 - in waterlogged soils, 99
 - reduction of by nitrogenase enzyme, 101
- IBDU. *See* Isobutylidene diurea
- Indolyl-3-acetic acid (IAA), assay of in wheat, 98
- Insect survey at Rothamsted, 237, 10·12
- Insect traps
- Atomaria linearis* caught in, 312
 - catches, effect of weather on, 148, 241
 - Chaetocnema concinna* caught in, 312
 - Feronia melanaria* caught in, 312
 - for aphids, 235, 311
 - for forewarning of crop infestation, 239
 - in Africa, 240–242
 - light traps, 240
 - pitfall traps, 246, 312
 - sites of in Britain, 237–240
 - suction traps, 235, 237
- Insecticides
- BHC, 225, 227, 314
 - carbamate, 10·20
 - desethylation, resistance to, 206
 - determination of on seeds, 225
 - diffusion in soils, 9·17
 - effect of soil moisture on, 9·15
 - effect on 'infection index' of take-all, 158
 - effect on soil fauna, 246
 - factory trials with, 312
 - for Wheat Bulb fly, 227
 - granular, effect of rain on, 205
 - metabolism of by housefly, 205, 9·30, 9·25
 - microcapsules, 215–218
 - NRDC 104, 205, 208, 227
 - NRDC 114, 215
 - organochlorine, 218
 - organophosphorus, 203, 205, 218, 221, 222, 227, 9·17, 9·20, 10·20
 - penetration into houseflies, 207, 9·30
 - persistence, 215, 246, 10·3, 10·17
 - poisoning of honeybees by, 218, 9·2, 9·3
 - residues in soils, 10·2
 - resistance to, 205, 245, 312, 9·11, 9·29
 - seed dressings, 205, 225, 226, 312
 - soil treatment with, 312
 - systemic, 221
 - uptake from solution by wheat, 221
 - volatilisation, 215
 - wireworm control by, 9·20, 10·20
- See also* Aphicides; Pyrethroids, synthetic; and names of individual insecticides
- Insects
- barrier, 219, 9·6
 - behaviour, compounds influencing, 207
 - colony counts, 220
 - distribution in crops, 10·7
 - effect of moonlight on catches, 240
 - effect of weather on catches, 241
 - effect of windbreaks on, 243–246, 10·31, 10·32, 10·33, 10·34
 - electrical confinement, 219, 9·6
 - in orchards, 246, 10·34
 - rearing chambers, humidity control in, 10·35
 - resistance to insecticides, 205, 247, 313, 9·11, 9·29
 - suction samplers for, 219
 - vacuum sampler for, 219, 10·32
- See also Musca domestica*
- Institute of Geological Sciences, 72
- Intensive Barley Experiment, 158
- Intensive Wheat Experiments, Rothamsted, 154
- International Biological Program, 40, 105, 135, 138
- International Hydrological Decade, 40
- Iron in soils
- effect of organic matter on determination of, 3·17
 - mobilisation of by decomposing plant matter, 85, 3·3
- Irrigation
- at Rothamsted, 35
 - at Woburn 1960–69, 34, 1·9, 1·10, 1·11
 - crop productivity and, 1·12

Numbers in italics refer to the Abstracts of Papers on pp. 362–428.

INDEX

- Irrigation (*contd.*):
 effect on nematodes, 8·16, 8·21
 for sugar beet, 35, 328, 330, 1·11
 Isobutylidene diurea (IBDU)
 as fertiliser for barley, 46
 as seed dressing for sugar beet, 313, 318
 Isoflavones in leaf protein, 137
 'Isolan', nematicidal activity of, 203
- Javesella pellucida*
 virus-like particles in, 144, 146, 150, 7·7
- Kale
 effect of trace elements on, 56
 photosynthesis and leaf area index in, 5·10
 respiration rates in, 38
 Kennington forest nursery, 50, 193
 Kent, soil survey in, 346
- Lake Victoria, sulphur in mud of, 88
 'Lannate'. See Methomyl
 Latosol, fertiliser leaching in, 2·22
 Lawes and Gilbert
 biochemistry at Rothamsted started by, 127
 results of experiments on fertilisers started by, 2·9, 2·10
- Leaf area
 effect of growth regulators on, 117
 effect of seedling treatment of sugar beet on, 112, 5·5
 effect of sucrose-solution sprays on potato, 115
 of short and tall wheats, 108
 photosynthesis and leaf-area index in kale, 5·10
 transpiration rate and, 31, 37
- Leaf canopy enclosures for studying effects of environment on plant growth, 1·5
- Leaf protein, 6·1, 6·2, 6·4, 6·5
 advantages of quick processing, 133
 air-drying of, 6·7
 appearance and quality, 134
 available amino acids in, 133
 extraction equipment, 128, 135
 flavour improvement, 134
 fractionation of, 132
 isoflavones in, 137
 methionine sulfoxide in, 133
 new species extracted, 134
 yields, 128, 134
- Leatherjackets, effect of cultivation on, 248
- Leaves
 age and virus infection, 127
 chlorophyll bleaching in, 128, 135
 chlorophyll breakdown in, 135
 enzymes in, 131
 leaf analysis to indicate fertiliser need, 41, 47, 51
 lipoxidase, 131, 6·9
 metabolic behaviour of, 127
 pigments in, 135
 respiration and virus multiplication, 129
 silicone coatings, effect of, 1·7
- Legumes, aphids and viruses on, 234
- Lepidoptera
 immigrant in Britain, 10·4
 migration of, 242
- Leptohylemia coarctata*. See Wheat Bulb fly
- Ley Arable Experiment at Rothamsted, 284, 286, 289, 299, 301, 14·1
- Leys, See Grass
- Lincolnshire, soil survey in, 343
- Linoleic acid in leaves, 128, 131
- Liquid nitrogen level controllers, 91
- Liquidambar styraciflua*, mycorrhiza on, 95
- Little Hoos field, virus diseases of beans on, 234
- Little Knott, 158, 162
- Liver fluke (*Fasciola hepatica*)
 molluscicides to control, 247
 snails as hosts, 249
- Livestock
 diseases of beef cattle, 269
 experiments, 270
 foot-and-mouth disease vaccines, 12·2
 on Broom's Barn farm, 337
 on Rothamsted farm, 302
 on Woburn farm, 307
 sheep dipping in Britain, 12·15
- Loess soils, 76–78
- Long Ashton Research Station, soil survey of, 359
- Lucerne (*Medicago sativa*)
 aphid and virus diseases of, 233
 IBP experiments with, 105
 irrigation for, 1·10
 nitrogen fixation in, 104–106
 trace-element content of residues, 86
- Lysimeters
 fertiliser leaching in, 2·22
- Magnesium fertiliser
 effect on crops in Reference Experiments, 56
 for potatoes, 57
 for sugar beet, 57, 151, 327, 328, 16·4, 16·5, 16·16
 on clay-with-flints soil, 41
 residual effects of, 54
 slug damage to potatoes and, 250
 soil analysis for, 329
- Maize (*Zea mays*)
 effect of P fertiliser on yield, 2·17
 effect on phorate on yield, 10·28
 effects of seed spacing, phorate and N on, 292
 frit fly on, 292, 10·28
 mycorrhiza on, 95
 residual effect of atrazine on, 293
 take-all on, 159
- Malathion
 poisoning of bees by, 219
 resistance of housefly to, 207
 to control pollen beetles, 301
- Malaya
 acid sulphate soils from, 87
 leaching of fertilisers in a latosol, 2·22
 nutrient status of rubber soils, 2·27
- Maneb, as fungicide for sugar beet seedlings, 314
- Manganese
 deficiency in sugar beet, 329
 mobilisation of by decomposing plant matter, 85, 3·3
 uptake by peas, 87
- Mangold clamps, aphid infested, 310
- Mecarbam, as soil insecticide, 314
- Medicago sativa*. See Lucerne
- Medicago truncatula* (barrel medic), nitrogen fixation in, 104, 105
- Menazon
 as aphicide, 147, 149, 309, 310
 as nematicide, 319
 effect on seedling emergence, 309
- Mercury content of seeds,
 determination of by X-ray fluorescence spectrometry, 89
- Mesophyll resistance of leaves, 31, 38, 39
- 'Metasystox' as aphicide, 150, 233, 301, 302
- Methiocarb
 as soil insecticide, 314
 to control soil arthropods, 247
- Methomyl ('Lannate')
 as aphicide, 310
 as insecticide, 313, 314
 as nematicide, 203, 318, 319

INDEX

Numbers in italics refer to the Abstracts of Papers on pp. 362–428.

- Methyl bromide
as fumigant for nematodes, 198, 200, 203
bromine residues in wheat and soil, 83
effect on mineralisation of soil organic matter, 82
- Methyl chloride, as fumigant for nematodes, 203
- Methylene dichloride, as fumigant for nematodes, 203
- Mica, 72–76, 3·14, 3·15
- Microclimate, 36
airflow inside the crop, 37
automatic recording of, 40
changes in soil water content, 37
- Mineralogy, 72–80
of buried loess soils, 76
of Colombian soils, 3·2
of Palaeogene sediments in Kent, 3·20
See also Clay minerals
- Ministry of Agriculture, Fisheries and Food
aphids surveys, 240
- 'Mocap' (O-ethyl S, S-dipropyl phosphorodithioate)
as nematocide, 199
- Mole cricket, 241
- Molecular weight of leaf extracts
determination of with Sephadex gels, 91
- Molluscicides, 247
- Montgomeryshire, soil survey in, 352
- Morphactin
effect on beans, 293
effect on oats, 119
effect on potato, 117, 5·9
effect on sugar beet, 119
- Mortierella* sp. on potato, 171
- Mosquitoes, toxicity of synthetic pyrethroids to, 214
- Moths, survey of in Britain, 10·5
- Moulding of stored products, 172–174
- Mouldy hay
Aspergillus flavus on, 174
health hazards, 7·5
methods of examining, 173
- Municipal composts, toxic elements in, 81
- Mustard beetle. *See Phaenon cochleariae*
- Musca domestica* (housefly)
metabolism of insecticide by, 205–207, 9·25, 9·30
penetration of insecticides in, 207, 9·30
resistance to insecticides, 205–207, 208, 9·24, 9·29
toxicity of synthetic pyrethroids to, 213
- Mycoplasmas, detection of in red clover, 147
- Mycorrhiza
effect on plant growth, 96
on maize, 95
- Nabam, effect on take-all in wheat and nematodes in soil, 8·21
- Nardus stricta*, mycorrhiza on, 95
- National Agricultural Advisory Service
aphid surveys, 236, 239
Experimental Husbandry Farms, 79, 163, 169
interpretation of experiments for, 269
- National Environment Research Council Experimental Cartography Units, 358
- National Institute of Agricultural Botany, Trawscoed, 315
- National Research Development Corporation
patent completed by, 220
See also Insecticides, NRDC 104 and NRDC 114
- National Vegetable Research Station, Wellesbourne
soil map of, 359
- Nature Conservancy
soil survey of Dead Man's Grave, Bury St. Edmunds, 359
- 'Nemagon' (Dibromochloropropane)
as nematocide, 203
- Nematicides
activity assessment of, 203
effect of in peat soils, 199
effect on potato yields, 171, 191, 199
effect on root-parasitic nematodes, 8·1
effect on sugar-beet yields, 198
for Docking disorder of sugar beet, 198, 316–322, 16·20
organophosphorus insecticide as, 203
potato-cyst nematodes and, 199–203, 8·4
residual effect of, 162, 190
trials in East Anglia and Yorkshire, 317
See also Soil sterilisation; and names of chemicals used as nematicides
- Nematodes
at Docking, Norfolk, 198
at Mepal, Isle of Ely, 202
at Terrington, Norfolk, 202
at Woburn, 185–203
beet cyst, 180
cereal cyst, 194–198, 8·14
cuticle of, 177
cyst nematodes, 176–187, 322, 8·14
damage to wheat roots, 190
diversity of, 8·22
Dorylaimoidea, oesophago-intestinal junction in, 8·26
ectoparasitic, 191, 8·16
effect of fertilisers on, 192, 194, 321, 8·21
effect of irrigation on, 8·16, 8·21
effect of Nabam on, 8·21
effect of ploughing on, 188, 189, 195, 8·11
effect of soil compaction on, 190
effect of soil sterilants on, 190, 194–203, 294, 319, 8·16, 8·21
effect of soil type on, 8·1, 8·9
effect of temperature on, 193, 8·19
fecundity and longevity, 193
feeding mechanisms, 176
from Antarctica, 8·23
from Florida, 8·18
from India, 8·18
from Mediterranean, 8·14
from Orkney Islands, 8·22, 8·24
from Wicken Fen, 8·24
giant cell groups, 182, 183, 8·17, 8·20
hatching agents, 178, 8·13
hatching factors, 179, 214
hybridisation, 187
in barley, 190, 194
in bean fields, 294, 299
in fen peat soil, 199, 201, 202
in sandy loam, 200
in silt soil, 202
in Sitka spruce nurseries, 191
insecticides, effect on numbers, 8·11
interbreeding, 8·25
internal structure, 178
laboratory methods with, 8·2
lesion nematodes, 190
maintenance under mineral oil, 8·10
mating, 179, 183–187
mating of pathotypes, 183–187
median bulb pump of, 176
microvilli, 177
migratory, 190, 8·1, 8·11
movement, measurement of, 8·12
needle nematodes, 199
oesophago-intestinal junction in, 8·26
oesophago-intestinal valve of, 177
on sugar beet, 180, 198, 316–322

Numbers in *italics* refer to the Abstracts of Papers on pp. 362–428.

INDEX

Nematodes (*contd.*):

- on wheat, 189, 190, 194, 197, 8·7, 8·11, 8·21
- Osborne's cyst, 181
- pathotypes, 181, 183–187
- pheromones as sex attractants, 179
- phytomones as stimulants, 179
- Poiseulle's formula, 176
- potato cyst, 179, 181–188, 191, 199, 8·3, 8·4, 8·13, 8·16, 8·19
- protein in extracts from, 185
- reciprocal crosses of *Heterodera rostochiensis*, 184
- rectal glands, 179
- reproduction, 188, 193
- resistant plants, 183, 8·4, 8·20
- root exudates, 179, 8·13
- root knot, 188
- root parasitic, 8·1
- round cyst, 181, 187
- seasonal changes in numbers, 190, 8·13
- sex attraction, 179–181, 188, 8·15
- sex determination, effect of temperature on, 8·19
- sex ratio related to infestation, 182, 8·17
- Solanaceae as host plants, 181, 188
- take-all on cereals and, 196, 197
- temperature, effect on survival, 181
- virus transmission by, 176
- Nematodes, specific names of
 - Anaplectus arenicola*, 8·23
 - Aphelenchoides blastophthorus*, 176
 - Aphelenchoides gynotylurus*, 8·18
 - Aphelenchoides marinus*, 8·18
 - Boleodorus thylactus*, 8·24
 - Cephalobus persegnis*, 8·6
 - Ditylenchus destructor*, 176
 - Ditylenchus dipsaci*, 176, 299, 300
 - Dorylaimellus globatus*, 8·24
 - Dorylaimus antarcticus*, 8·23
 - Eudorylaimus antarcticus*, 8·23
 - Eudorylaimus rhopalocercus*, 8·24
 - Globodera* spp., 187
 - Hemicycliophora* spp., 177
 - Heterodera* spp., 178, 188, 8·15, 8·25
 - Heterodera avenae*, 194–197, 8·15, 8·21
 - Heterodera carotae*, 8·15, 8·25
 - Heterodera cruciferae*, 178, 188, 8·15, 8·25
 - Heterodera glycines*, 8·15
 - Heterodera goettingiana*, 8·15, 8·25
 - Heterodera latipons* n.sp., 8·14
 - Heterodera mexicana*, 181, 8·15
 - Heterodera rostochiensis*, 178–181, 184, 187, 188, 191, 8·12, 8·13, 8·15, 8·17, 8·19, 8·20
 - Heterodera schachtii*, 178, 180, 188, 322, 8·15
 - Heterodera tabacum*, 178, 181, 8·15
 - Heterodera trifolii*, 294, 8·15
 - Heterodera virginiae*, 181
 - Hexatylus* spp., 177
 - Longidorus* spp., 316–320, 322
 - Longidorus attenuatus*, 198
 - Longidorus elongatus*, 199, 319
 - Meloidogyne* spp., 188
 - Meloidogyne ardenensis*, 188
 - Meloidogyne arenaria*, 188
 - Meloidogyne hapla*, 188
 - Meloidogyne naasi*, 188
 - Meloidogyne thamesi*, 188
 - Paratylenchus* spp., 191
 - Plectus murrayi* n.sp., 8·23
 - Pratylenchus* spp., 191, 294, 321, 8·9
 - Pratylenchus crenatus*, 191, 8·9
 - Pratylenchus fallax*, 190, 8·9
 - Pratylenchus minyus*, 191, 8·9
 - Pratylenchus pinguicaudatus* n.sp., 8·7, 8·9
 - Pratylenchus thornei*, 8·9
 - Rhabditis* spp., 321

Nematodes, specific names of (*contd.*):

- Rotylenchus robustus*, 193
- Thornenema* spp., 177
- Thornenema wickeni*, 8·24
- Trichodorus* spp., 191, 198, 294, 316, 317, 319, 321
- Trichodorus cylindricus*, 198, 320
- Trichodorus pachydermus*, 193
- Tylencholaimus coronatus*, 8·24
- Tylencholaimus feni* n.sp., 8·24
- Tylenchorhynchus* spp., 191–193, 294, 321
- Tylenchorhynchus brevidens*, 193
- Tylenchorhynchus dubius*, 193, 8·16
- Tylenchus* spp., 191–194, 321
- Tylenchus costatus*, 193
- Tylenchus emarginatus*, 193, 194
- Xiphinema* index, 177
- 'Neosar' as nematocide, 318
- Neutron moisture meter, 37, 40
- Nicotiana* spp. *See* Tobacco
- Nitrate
 - in crops, 2·29
 - in drainage water, 51, 52, 2·29
 - leaching of by rain, 51
- 'Nitro-Chalk'
 - compared with ammonia, 42–45
 - compared with IBDU, 46
 - compared with organic manures, 58
 - on forest nurseries, 49
- Nitrogen fertilisers
 - effect on carbohydrates and free amino acids in grass, 2·25
 - effect on nematodes, 321
 - effect on take-all in wheat, 160
 - efficiency of, 51
 - for arable crops, 2·5
 - for barley, 46, 51
 - for conifer seedlings, 49
 - for sugar beet, 51, 321, 16·6
 - for wheat, 51, 109, 160, 5·6
 - residual effect of, 47
 - time of application, 51
 - See also* Ammonia; Ammonium nitrate; IBDU, 'Nitro-Chalk'; Urea
- Nitrogen fixation
 - by blue-green algae, 101
 - by soil clostridia, 100
 - effect of combined nitrogen on, 4·5
 - effect of drying soil on, 101
 - effect of light intensity on, 105
 - effect of temperature on, 101, 104
 - effect on legume yields, 105
 - granulose reaction for anaerobes, 100
 - on Broadbalk soil, 101
- Nitrogen in soil
 - correlation with crop performance, 2·7
 - effects of organic and inorganic manures on, 60, 61
 - leaching of, 41, 51
 - measurement of in laboratory, 2·7
 - mineralisable, 61
 - processes affecting, 2·6
- Nitrogenase activity in soil, 101, 104, 105
- Nodulation
 - effect of combined nitrogen on, 4·5
 - effect of light intensity on, 105
 - effect of temperature on, 104
- Norfolk, soil survey in, 342
- Northumberland, soil survey in, 341
- Norway spruce (*Picea abies*)
 - PK fertilisers for seedlings and transplants, 2·21
- Nosema apis*
 - bee infection by, 259
- Nottinghamshire, soil survey in, 343

INDEX

Numbers in italics refer to the Abstracts of Papers on pp. 362-428.

- 'N-serve' (2-chloro-6-trichloromethyl-pyridine)
effect on *Rhizoctonia solani*, 160
effect on potato diseases, 228-230
effect on sugar-beet yield, 199
effect on take-all in wheat, 160
effect with anhydrous ammonia on grass, 44
hydrolysis of in soil, 69
- Oats
effect of growth regulators on, 119
frit fly on, 10-26, 10-27, 10-29
root growth of, 109
yields, 301
- Ochre in field drains, oxidation of pyrites and, 87
- Olpidium brassicae*, as virus vector, 7-18
- Onion (*Allium cepa*)
effect of phosphate on, 96
mycorrhiza on, 96
- Oospora pustulans* on potato, 163, 167, 168, 171, 7-1, 7-11
- Ophiobolus graminis*. See Take-all
- Organic manures
compared with 'Nitro-Chalk', 58
cumulative effect of at Woburn, 57
effects of C, N, organic P and soluble P on, 60
effects on mineralisable N in soils, 61
- Organo-phosphorus insecticides
control of wireworms with, 10-20
diffusion in soils, 9-17
metabolism of by housefly, 205
nematicidal activity of, 203
poisoning of bees by, 218
polarography of, 222
seed dressings against Wheat Bulb fly, 227, 9-20
uptake from solution by wheat, 221
- Oscinella frit*. See Frit fly
- Oxycarboxin for wheat diseases, 108, 159
- Paraquat
for barley stubble, 298, 300
for couch grass, 298
on Broadbalk, 298
slit seeding and, 247
- Parathion
for frit-fly control, 10-26
for wireworm control, 10-20
metabolism of by housefly, 206
resistance of housefly to, 207
- Park Grass plots, 5-1
organic P in, 61
Rhizobium in, 4-1
- Pastures field, 82, 162
- Peas (*Pisum sativum*)
aphids and viruses on, 233, 235
- Pembrokeshire, soil survey in, 351
- Periplaneta americana*. See Cockroach
- Pesticides
nematicidal activity of, 203
- Phaedon cochleariae* (Mustard beetle)
toxicity of synthetic pyrethroids to, 213
virus transmission by, 234
- Phlogopite, structure of, 74
- Phoma* spp. on potato, 163-166
- Phorate
as nematicide, 319
effect of environment on effectiveness, 221
effect on frit fly, 292, 10-28
effect on soil fauna, 246, 247
effect on sweet corn yield, 10-28
for wireworm control, 10-20
polarographic response of, 222
- Phosphamidon, nematicidal activity of, 203
- Phosphate fertilisers
effect on maize and cotton yields, 2-17
in 2000 A.D., 2-4
- Phosphate fertilisers (*contd.*):
mono-urea phosphate compared with super-phosphate, 2-28
residual effects of, 41, 52-54, 12-23
superphosphate as seed dressing, 313, 318
superphosphate, cumulative effects of, 53-54, 2-12, 2-14
- Phosphorus in soil
analysis of total content, 2-24
effect of organic manures on, 60
estimation of organic, 60, 61
hexa-, 62
in Tanzania, 2-16, 2-17
inositol penta-, 62
leaching on sandy podzol, 2-21
organic, in acid tea soils, 62
organic, in Rothamsted soils, 62
phosphate potential, measurement of, 2-16, 2-17
- Photosynthesis
carbon-dioxide output from subsoil and, 33
equipment for studying, 40
estimation of in laboratory, 38
growth analysis and, 37
inhibition of by diuron, 129
leaf age and, 127
leaf removal and, 39
leaf-area index and, 5-10
mesophyll resistance and, 39
- Phytophthora infestans* on potato, 163
control of, 228, 302, 9-26, 9-27
- Picea abies*. See Norway spruce
- Picea sitchensis*. See Sitka spruce
- Piperonyl butoxide, resistance of housefly to, 208
- Plant residues
trace elements in soil mobilised by, 86, 3-3
- Plant-water relationships, 34
- Plant growth processes
radiation intensities and, 32, 37
rates of net assimilation and, 32
resistance to carbon dioxide transfer and, 32
transport constant and, 31, 38
- Plant hopper (*Javesella pellucida*)
virus-like particles on, 144, 146, 150, 7-7
- 'Plant Protection JF 2614' as nematicide, 318
- Ploughing, effect on nematode populations, 188-190, 8-11
- Plusia* spp., 241
food use by *P. gamma*, 242
migration of, 242
- Plutella xylostella*, behaviour of larvae, 242
- Pollen beetle (*Meligethes* spp.), 218
control of by malathion, 301
control of by synthetic pyrethroids, 215
- Potassium deficiency in crops
agmatine for diagnosing, 49
- Potassium fertilisers
effect of rainfall on, 2-21
for grass, 41, 47-49, 54-56, 2-19, 2-25
for Sitka spruce seedlings and transplants, 2-21
'luxury' uptake by grass, 41
residual effects of, 54, 2-13
- Potassium in soils
ability of extracts to remove, 63, 2-18
available, uptake by grass, 2-19
buffering capacity of, 2-2
K : Al exchange, 66
leaching on sandy podzol, 2-21
non-exchangeable, 64
quantity/activity ratio curves, 63
quantity/intensity relationships, 2-20
quantity/potential relationships, 62, 2-18
release from soils, effect of pH on, 64
'uptake potentials', 63
- Potato Marketing Board Experimental Station, Sutton Bridge, 165

Numbers in italics refer to the Abstracts of Papers on pp. 362–428.

INDEX

- Potatoes
 aphids on, 151, 325
 bacterial soft rot (*Erwinia carotovora*), 170
 blackleg, 163, 170
 black scurf (*Rhizoctonia solani*), 163, 167, 168, 171
 blight (*Phytophthora infestans*), 163, 228, 9-26
Cephalosporium on, 171
 common scab (*Streptomyces scabies*), 163, 168, 205, 228, 229
 cyst nematodes, 199–203, 8-4
 damage from air pollution, 174
 damage to apical meristems by 'Hibitane' and 'Triton X', 114
 dry rot (*Fusarium caeruleum*), 163
 effect of growth regulators on, 117, 5-9
 effect of nematicides on, 171, 199–203
 effect of 'N-serve' on diseases, 228–230
 effect of partial defoliation on tuber growth, 113
 effect of pesticides on yields, 203
 effect of ploughing on nematodes in, 188–190, 8-11
 effect of soil fumigation on fungus diseases, 166–167, 171, 198, 228–230
 effect of sucrose solution sprays on tuber formation, 114
 farmyard manure + NPK for, 57
 fertilisers for, 47–49, 53, 54, 57, 58, 250, 283, 284, 289–292
 fertilisers and damage by slugs, 250
 fungicides for, 166, 171, 198, 228–230, 7-10, 9-26
 fungus diseases, 163–171, 7-1, 7-10, 7-11
 gangrene (*Phoma* spp.), 163–166
 healthier seed, 167, 168
 irrigation for, 35, 36, 1-11
 leaf analysis for K in, 49
 magnesium fertiliser, 57, 250
 N and K fertilisers, 48, 49, 57
 nematicides, 171, 191, 198–203
 nematode-resistant, 183–188
 nematodes on, 179–188, 191, 199–203, 8-13, 8-16, 8-19, 8-20
 net assimilation rate and leaf area, 113
 on Arable Reference Plots, 250
 on Cultivation Weedkiller Rotation experiment, 291, 299
 powdery scab (*Spongospora subterranea*), 163
 residual and cumulative value of superphosphate on, 53
 residual effect of N and K fertilisers on, 48, 49
 skin spot (*Oospora pustulans*), 163, 167, 171, 7-1, 7-11
 slug damage to varieties, 249
 sulphanilamide to prevent bacterial growth on, 114
 surveys of maincrop and early, 268, 12-5
Verticillium wilt on, 166, 198
 viruses, 140, 142, 143, 145, 151, 235, 7-9, 7-16, 7-21
 varieties, 188, 191, 200–202, 113–115, 151, 250, 302, 305
 yields on Classical experiments, 283–284, 289–292, 299
 Potential transpiration, 37
 Potentiometer recorders, 91
 Powdery mildew of cereals (*Erysiphe graminis*)
 epidemiology of, 151, 300
 systemic fungicides on, 152
 'Prebane', to control blackgrass, 298
 Propylene oxide, as fumigant for nematodes, 203
 Protein nitrogen in grass
 effect of potassium and sodium on, 55
Pseudomonas sp., aniline utilisation by, 99, 4-18
 Psychrometer, Peltier effect, 40
 Putrescine in K-deficient crops, 49
 Pyrethrin I, toxicity to cockroach, 209–215
 Pyrethroids, synthetic
 chemistry of, 213
 insecticidal activity of, 212
 pollen-beetle control by, 215
 resistance of housefly to, 208
 seed dressings against Wheat Bulb fly, 227
 toxicity to housefly, 213
 Pyrethrum extract
 resistance of housefly to, 208
 Pyrites
 in Lake Victoria mud, 88
 oxidation of in soils, 87
Pythium sp. on potato, effect of soil fumigation on, 171
 o-Quinones, reaction with tobacco mosaic virus, 130
 Quintozene, effect on potato scab, 229
 Radiocarbon dating
 of buried soils, 76
 of soil organic matter, 76, 83–85
 Radiocarbon in soil, natural and bomb-derived, 83–85
 Radiometers, 40
 Radish
 flea beetles on, 10-16
 sulphur deficiency in, 64
 Rape, oil-seed (*Brassica napus*)
 insecticide poisoning of bees on, 218
 insecticides for pollen beetle on, 218, 301
 Reference experiments at Rothamsted and Woburn, 56
 Residual Phosphate Rotations
 barley on, 288
 potatoes on, 291
 Respiration rates in plants, 38
 RH 893 as fungicide on sugar beet, 314
 Rhizobiophages, mutation of, 4-7
Rhizobium
 bacteriophage, 103
 effect of antibiotics on, 102
 effect of cold pretreatment on, 104
 effect of yeast extracts on, 101
 effect on root nodules of *Trifolium subterraneum*, 4-12, 4-15, 4-16, 4-17
 electron microscopy of roots inoculated with, 104, 4-4
 exudates of seedlings inoculated with, 104
 fine structure of, 4-3
 growth in batch culture, 101
 in soils of Rothamsted and Woburn farms, 4-1
 nodulation by, 4-5
 polysaccharide of, 103
R. trifolii in peat culture, 4-4
Rhizoctonia solani on wheat, 159, 160
 effect of 'N-serve' on, 160
 on potato, 163, 167, 168, 171
 Rhizosphere, pectic enzymes in, 104
 Ribonuclease in leaf extracts, 128, 131
 Ribonucleic acid (RNA), 131, 139, 141
 Ribosomes, isolation from cell walls, 6-10
 Rice, analysis of experiments on, 270
 Roots, penetration of soil by, 32, 1-13
 Rotations
 fertilisers on, 334
 frequency of beet and barley in, 334
 on Broom's Barn farm, 334
 on Rothamsted farm, 300
 on Woburn farm, 306
 Rothamsted Reference Plots
 leaf analysis for K in potatoes on, 49
 Rubber, nutrient status of soils for, 2-27
 Rye, effect of soil fumigation on, 162

INDEX

Numbers in italics refer to the Abstracts of Papers on pp. 362–428.

- Salicella fasciata*, a snail-killing fly, 10-30
 Sawyers I Field
 residual and cumulative effect of super-phosphate on, 53
 Saxmundham
 bean weevil at, 232
 barley at, 46, 47
 effect of leaching on nitrate in crops at, 51
 field experiments at, 281
 grass experiments at, 43
 Intensive Wheat Experiment at, 51, 154
 residual effect of farmyard manure and super-phosphate, 2-14
 Rotation I experiment, 51
 Rotation II experiment, 60
 sugar beet at, 326
 take-all in wheat at, 156
 weather at, 433
 Scatophagid flies, *Entomophthora* spp. on, 261
 Schradan, nematocidal activity of, 203
 Sciomyzidae, snail-killing flies, 10-30, 10-36
 Sephadex gels, for determination of molecular weight of leaf extracts, 91, 131
 Sesamex, 208
 Silicates, determination of major elements in, 90, 92
 Silicate minerals, colorimetric determination of calcium in, 3-12
 Simazine
 effect on beans, 42, 67, 162, 299
 effect of soil organic matter on, 67
 residues in soil, 67
 Sitka spruce (*Picea sitchensis*)
 forest growth, effect of N on nursery crop on, 49
 K fertiliser for seedlings and transplants, 2-21
 nematodes on, 191, 194
 nitrogen, effect on bud development, 50
 on K-deficient soils, 89
 PK fertilisers for seedlings and transplants, 2-21
 rainfall, relationship to K fertilisers on, 2-21
Sitona lineatus. See Bean weevil
 Slit-seeding, paraquat and, 247
 Slugs
 effect of extracts of potato tubers on, 249
 metalddehyde, effect of, 9-21
 potato varieties susceptible to, 249, 250
 Snails, 249
 Sodium dodecylsulphate, preincubation of virus with, 130
 Sodium fertilisers
 effect on composition of grass, 55
 for sugar beet, 328, 16-19
 residual effects of, 55
 substitute for potassium, 42, 55
 Soil acidity, effect on K release by soil, 64
 Soil aeration, 33
 Soil air, distribution of, 1-3
 Soil bacteria, production of growth regulators by, 98
 Soil classification, numerical approach to, 3-19
 Soil compaction
 effect on nematodes, 188–190
 sugar-beet growth and, 330
 Soil conditioners, effect on sugar-beet, 326
 Soil consolidation apparatus, 91
 Soil fauna
 effect of cultivation on, 247
 effect of moisture and temperature on, 248
 effect of pesticides on, 160, 246, 10-19
 invertebrates, 247
 method of extraction, 10-22
 of Dimlington Silts, East Yorkshire, 3-16
 Soil fumigation see Soil sterilisation
 Soil geochemistry, 81
 Soil mapping, automated cartography, 358
 Soil mapping units, physical properties of, 2-1
 Soil metabolism effect of fumigation on, 83
 Soil micromorphology, 77, 92, 353, 3-2, 3-18, 3-20
 Soil mineralogy, 353
 Soil moisture
 effect on soil fauna, 248
 effect on take-all in cereals, 156
 measurement of, 354
 Soil morphology and chemistry, 352
 Soil nutrients, distribution of, 1-3
 Soil organic matter
 effect of methyl bromide on, 82
 effect on determination of ferrous iron in soils, 3-17
 effect on simazine, 67
 fixation of by ammonia, 44
 fractionation of, 66
 K : Al exchange and, 66
 mineralisation, effect of formaldehyde on, 82
 radiocarbon dating of, 76, 83
 reactions with trace elements, 85
 residual effects of fumigation on mineralisation, 82
 Soil respiration, 33
 effect of fumigation on, 82, 83
 movement of gases in, 1-4
 Soil sampling, in the Sherborne series, 357
 Soil series
 Denchworth series, 81
 variability of soils in, 81
 Soil sterilisation
 Docking disorder and, 319, 16-6
 effect on beans, 162, 294
 effect on cereals, 162, 2-15, 7-19
 effect on grass, 2-15
 effect on mineralisation of organic matter, 82
 effect on N content of crops, 2-15
 effect on potato diseases, 171
 effect on soil metabolism, 83
 residual effect of on cereals, 162
 to control nematodes, 190, 194, 198–203, 294, 317–332, 8-16, 8-21
 See also Aphicides; Nematicides, and names of chemicals used as sterilants
 Soil surveying
 air photography in, 356
 storage of data, 357
 Soil Surveys in
 Berkshire, 347
 Cambridgeshire, 341
 Carmarthenshire, 349
 Cheshire, 341
 Derbyshire, 342
 Devonshire, 349
 Essex, 346
 Gloucestershire, 348
 Herefordshire, 343
 Huntingdonshire, 342
 Isle of Ely, 341
 Kent, 346
 Lincolnshire, 343
 Montgomeryshire, 352
 Norfolk, 342
 Northumberland, 341
 Nottinghamshire, 343
 Pembrokeshire, 351
 Yorkshire, 339
 Soil temperature
 effect on soil fauna, 248
 effect on take-all in cereals, 156
 measurement of, 355
 Soils from sedimentary rocks
 thin sections, preparation of, 3-10
 trace elements in, 3-1

Numbers in italics refer to the Abstracts of Papers on pp. 362–428.

INDEX

- Solar radiation, efficiency of conversion in plants, 37
- Soil water
distribution of, 1-3
measurement of, 1-14
- Solanum multidissectum*, potato cyst nematodes on, 183–187, 8-20
- Solanum dulcamara* (woody nightshade), as host of nematodes, 188
- Solanum nigrum* (black nightshade), as host of nematodes, 188
- Solanum tuberosum*, ssp. *andigena*, potato cyst nematodes on, 183–187, 8-20
- Soyabean (*Glycine max*)
nitrogen fixation in, 104
- Spectrometry, X-ray fluorescence, 89
- Spodoptera exempta* (army worm), 241
- Spongospora subterranea*
on potato, 163
potato mop top virus and, 142
- Spore traps, 263
radial outflow turbine for, 220, 9-5
- Staphylinid beetles, predators on aphids, 237
- Stackyard, Wheat Bulb fly on, 252
- Statistical analysis
classification problems, 267
crop experiments with N fertiliser, 269
experiments for Commonwealth and Overseas, 270
for N requirement of sugar beet, 12-4
for National Agricultural Advisory Service, 269
livestock experiments, 270
of foot-and-mouth disease vaccines, 12-2
principal coordinate analysis, 268
residual phosphate experiments, 12-23
routine analysis, 269
sheep dipping in Britain, 12-15
soil-profile classification, 12-16
survey of diseases of beef cattle, 270
Survey of Fertiliser Practice, 268
Survey of Foliar Diseases of Barley, 269
surveys of main crop and early potatoes, 268, 12-5
See also Computer
- Statistical programming
algorithms, 266, 12-8, 12-9, 12-10, 12-13, 12-14, 12-18
analysis of variance, 265
autocodes, 12-11
cluster analysis, 265
data structures, 12-17
derived variates, 265
General Lattice Program, 264
General Survey Program, 268, 269, 277
GENSTAT system, 264
hierarchical agglomerative cluster analysis, 266
input-output, 264
maximum likelihood estimation, 267
Maximum Likelihood Program, 264
multidimensional scaling, 266
Multivariate Analysis Program, 264, 265, 12-1
principal coordinate analysis, 266
regression analysis, 265
See also Computer
- Statistical theory
approximate representation of samples, 267
classification and geology, 12-12
combinatorial problems, 266, 12-13
computing languages, 266
data structures, 266
divisive hierarchical clustering, 267
errors of long-term experiments, 12-19
fractional factorial designs, 267, 12-20
Kruskal's measure of monotone stress, 267
maximum likelihood estimation, 267
- Statistical theory (*contd.*):
missing values in experiments, 12-21
regression, 267
- Stomatal resistance of leaves, 31, 38, 1-7, 1-8
- Stored products, moulding of, 172–174
- Streptomyces scabies* on potato, 163
control of, 168, 205, 228
susceptibility of potatoes, 168
- Subterranean clover. *See* *Trifolium subterraneum*
- Sugar beet
Aphanomyces cochlidos on, 314
aphids on, 235, 308–315, 16-6
boron deficiency on, 151
cell size and sugar content, 112
chloride in tops and roots, 70
chlorophyllase of leaves, 6-8
cyst eelworms on, 322
defoliation, effect on yield, 312
Docking disorder, 198, 316–322, 16-6, 16-20
downy mildew, 315, 16-1
effect of growth regulators on, 119, 5-5
effect of N fertilisers on, 51, 110, 321, 16-6
effect of 'N-serve' on, 199
effect of seedling treatment on, 112, 5-5, 5-8
farmyard manure and NPK for, 57, 16-15
fertilisers for, 57, 323, 324, 326–334, 337, 16-12, 16-13, 16-17, 16-18, 16-22, 16-23
fungicides for, 314, 318
harvest methods, 323
herbicides, damage from spray drift of, 333
irrigation for, 35, 328, 330, 1-11
leaf diseases, 315
liming, long-term effects of, 327
machine for rubbing fruit, 16-11
magnesium fertiliser for, 57, 151, 327, 328, 16-4, 16-5, 16-16
manganese deficiency, 329
N fertilisers for, 326, 327, 329, 330, 332, 16-13, 16-17, 16-18
N requirement, statistical analysis of, 12-4
nematicides for, 198, 317, 16-20
nematodes on, 180, 198, 316–322
Phoma betae on, 314
plant spacing, 330
P fertiliser as seed dressing, 313, 318
pollen liberation, 324
potassium fertilisers for, 16-19
Ramularia leaf spot, 315
root fanginess, 322
root growth and photosynthesis, 5-7
root studies, 331
seed production, 322
seed storage, 326
seed washing for germination tests, 325
sodium fertiliser for, 328, 16-19
soil compaction and growth, 330
soil conditioners, effect on growth, 326
sowing time, effect on seed yield, 323, 324, 332, 16-22
statistical analysis of N requirement, 12-4
sugar content, 110, 301, 312
virus diseases, 151, 308–311, 316–322
yields, 283, 284, 337
See also Docking disorder; Herringswell
Rotation Experiment
- Sugar-cane bagasse, 172
- Sulphate reduction in waterlogged soils, 3-4
- Sulphate soils, oxidation of pyrite and, 87
- Sulphur
deficiency in radishes, 64
determination of in soil, 90, 3-5
effect on crops in Reference Experiments, 56
for conifers, 2-3
in Lake Victoria mud, 88
- Sulphur dioxide as air pollutant, 174, 3-13

INDEX

Numbers in *italics* refer to the Abstracts of Papers on pp. 362-428.

- Surface area of aggregates, 3-8
- Swedes
residual and cumulative effects of super-phosphate on, 53
- Sweet corn. *See* Maize
- Syrphid flies
Entomophthora spp. on, 261
- Take-all on cereals (*Ophiobolus graminis*)
benomyl for, 159, 230
bioassays for, 159
chemical control of, 159, 162, 7-19
crop rotations and, 154, 158
effect of aureofungin on, 161
effect of 'break crops' on, 154, 159
effect of direct seeding on, 159
effect of insecticides on, 159
effect of N fertiliser on, 160
effect of Nabam on, 8-21
effect of 'N-serve' on, 160
effect of paraquat on, 160
effect of soil fumigation on, 159, 162, 7-19
effect of soil moisture on, 156
effect of soil temperature on, 156
fluctuations in, 157
fungicides for, 228, 230
growth in rhizosphere, 98
host nutrition and, 160
'infection index', 158, 160
infectivity assays in soil, 156, 7-12, 7-13
microbiology of, 98, 161
nematodes and, 161, 196, 197
on maize, 159
on Rothamsted farm, 300
serological identification, 161
'take-all decline', 155
- Tea (*Thea chinensis*)
bud dormancy, 116
effect of aluminium on growth in Ceylon, 65
leaf production, effect of temperature and light on, 115
organic P in acid soils in Ceylon, 62
- Tecnazene, effect on potato scab, 229
- 'Telone'
as nematicide, 200, 319
- Temik. (*See* Aldicarb)
- Thiabendazole compared with organo-mercurial fungicide, 166
- Thimetphorate, 160
- Thionazin
as nematicide, 203, 318
for wireworm control, 10-20
- Thrips (*Thrips tabaci*)
virus transmission by, 234
- Tillage, cereal production and, 32
- Tobacco
analysis of experiments on, 270
virus diseases of, 127-131, 139, 140, 141, 142, 143, 144, 145, 146, 316, 7-8, 7-14, 7-18
- Tomato
as host for nematodes, 188
mycorrhiza on, 95
sex ratio of nematodes on, 182
virus diseases of, 145, 316, 7-15, 7-17
- Trace elements
amounts dissolved from oxides by plant residues, 86, 3-3
determination of in soils and plants, 90
effect on crops in Reference Experiments, 56
in lucerne residues, 86
in soils from sedimentary rocks, 3-1
reaction with soil organic matter, 85
sprays for clay-with-flints soil, 41
- Transpiration
equipment for studying, 40
- Transpiration (*contd.*):
leaf area and, 31, 37
potential, 37
Transport constant within a crop, 31, 38
Traps. *See* Insect traps
Trichlorphon, for wireworm control, 10-20
Trifolium incarnatum, aphids and virus disease on, 236
Trifolium pratense (red clover)
nitrogen fixation in, 104, 105
Trifolium subterraneum
effect of *Rhizobium* on, 4-12, 4-15, 4-16, 4-17
effect of root temperature on nodules, 4-12, 4-14, 4-15
nitrogen fixation by, 104, 105, 4-12, 4-14
nitrogenase activity of nodules, 4-14
root-hair infection and temperature, 4-13, 4-16, 4-17
- Twitch grasses, fallows to control, 300
- Urea
compared with ammonium nitrate for barley, 41, 2-28
compared with 'Nitro-Chalk' for barley, 45
mono-urea phosphate compared with super-phosphate, 2-28
- Ustilago nuda* (loose smut)
on cereals, 300, 305
'Vitavax'/organomercury compound for control, 300
- Verticillium* wilt on potato
soil fumigation for control, 171, 198
benomyl for control, 166, 168, 198, 229
nematodes and, 166, 198
- Vesicular-arbuscular mycorrhiza
Endogone spores and, 4-6
plant growth response to, 4-11
- Vetch
nematodes feeding on, 176
- Vicia atropurpurea*, nodulation in, 104, 105, 4-5
- Vicia faba*. *See* Field beans
- Vicia hirsuta* (hairy vetch)
nitrogen fixation in, 104, 105
- Vigna sinensis*, nodulation in, 104, 4-5
- Viruses
aphid vectors of, 147, 223, 233-237
beetle-transmitted, 141
biochemistry of, 6-6
defective strains of tobacco mosaic, 7-14
effect of time of infection on crop yield, 233
electron microscopy of, 145-147, 7-17
electrophoresis, 140
epidemiology of cereals, 147-150
fungus vector *Spongopora subterranea*, 142
in sugar beet seed, 311
inactivation of nucleic acid, 128
infectivity of extracts of infected plants, 128
lamellae associated with, 145
leaf age and, 127
leaf respiration and, 129
multiplication of, 128, 129, 139, 144, 7-15
mycoplasmas, 147
myxoviruses, 145
on beans, 234
on carrots, 147
on cereals, 142, 144, 147-150
on lucerne, 233
on peas, 233
overwintering of, 148
protein in chloroplasts of, 144
reaction with *o*-quinones, 130
research in crop protection, 7-2
ribonucleic acid (RNA) of, 139, 141, 7-8
ribosomes associated with, 146
salt concentration of, 141

Numbers in italics refer to the Abstracts of Papers on pp. 362–428.

INDEX

- Viruses (*contd.*):**
 serology, 140, 7-21
 soil-borne, 142, 316
 spray-warning system for, 16-8
 spread of, 149
 stylet-borne, 235
 synthesis of, 129
 ultraviolet radiation of, 141, 7-8, 7-9, 7-16
 virus particles on *Javesella pellucida*, 144, 146, 150, 7-7
 virus-particle development, 145
- Viruses, names of**
 acute bee paralysis, 259
 Andean potato latent, 141
 barley yellow dwarf, 147–150
 bean leaf roll, 233
 bean yellow mosaic, 234, 236
 beet mosaic, 236
 broad bean stain, 234
 broad bean vascular wilt, 143, 162
 bromegrass mosaic, 7-15
 cabbage black ring spot, 236
 carrot motley dwarf complex, 147
 cauliflower mosaic, 236
 chronic bee paralysis, 259
 clover yellow vein, 7-21
 cocoa swollen shoot, 147
 cocksfoot mottle, 150
 cucumber mosaic, 236
 'dense-nucleus' of wax moth, 261
 eggplant mosaic, 141
 European wheat striate mosaic, 144, 146, 150
 henbane mosaic, 143
 leaf roll, 151
 oat mosaic, 142
 pea mosaic, 224
 polyhedrosis, 142, 261
 potato C, 143
 potato mop top, 142
 potato X, 140, 145, 151, 7-9, 7-16, 7-21
 potato Y, 143, 146, 151, 236, 7-21
 red clover vein mosaic, 7-21
 sacbrood of bees, 142, 259
 satellite virus of tobacco necrosis, 140, 146, 7-18
 sugar beet mosaic, 224
 sugar beet yellow net, 144
 sugar beet yellows, 151, 308, 311
 swollen shoot of cocoa, 146
 tobacco mosaic, 127, 128, 129, 130, 131, 139, 141, 7-8, 7-14
 tobacco necrosis, 140, 145, 146, 7-18
 tobacco rattle, 316
 tomato black ring, 316
 tomato bushy stunt, 7-15
 tomato spotted wilt, 145, 7-17
 tropaeolum ring spot, 143
 turnip yellow mosaic, 141
- Volcanic ash soils, 78**
- Wareham forest nursery, 50**
- Wasps (*Vespula vulgaris*)**
 nest entrance markings with pheromones, 11-8
- Water movement in plants, 34**
- Water Resources Board**
 study of soils of River Dee Catchment for, 358
- Waterlogged soils**
 free hydrogen sulphide in, 3-4
 hydrocarbons in, 99
 sulphate reduction in, 3-4
- Wax moth (*Galleria mellonella*)**
 'dense-nucleus' virus of, 261
 on honeybee combs, 261
 polyhedrosis virus of, 261
- Weather**
 effect on crops, 296, 304
 records at Broom's Barn 1968–69, 432
 records at Rothamsted 1968–69, 296, 430
 records at Saxmundham 1969, 433
 records at Woburn 1968–69, 304, 431
- Weed Research Organisation, 120**
- Weeds, 120–125**
 aphids on, in sugar beet, 310
 competition with crops, 120, 125, 5-12
 fungi on, 125
 on Broadbalk, 125
Ranunculus arvensis (corn buttercup), 125
 seed dormancy, 122
Veronica hederifolia (ivy-leaved speedwell), 125
 See also *Agrostis*; Blackgrass, Couchgrass; Wild Oats
- Weevils**
 bean (*Sitona lineatus*), effect of dieldrin on, 232
 bean, virus transmission by, 234
 clover seed (*Apion* spp.), virus transmission by, 234
- Welsh Plant Breeding Station, 194**
- Wheat**
 competition with *Agropyron repens*, 5-12
 dwarf, eyespot on, 161
 effect of CCC on, 118, 5-6, 5-11
 effect of N on, 51, 58, 110, 160, 5-6
 effect of organic manures on, 58
 effect of trace elements on, 56
 growth substances in, 116
 irrigation for, 36, 1-11, 5-6
 leaf analysis for, 51
 mildew on, 108, 151–154, 300, 305
 nematodes on, 189, 190, 194–198, 8-7, 8-11, 8-21
 in Cultivation-Weedkiller Experiment, 286, 299
 in Woburn Intensive Cereals Experiment, 286
 on Broadbalk, 282, 284
 on Fosters, 285
 on Highfield, 285
 on Ley-Arable Experiment, 284, 285
 paraquat slit-seeding and yield, 247
 residual effect of fertilisers on, 47, 58
 semi-dwarf, 108
 take-all and nematodes on, 196–197, 8-21
 yellow rust on, 108
 Wheat Bulb fly on, 250
 yields, 58, 108, 282, 284, 285, 301
 See also Cereals, Take-all
- Wheat Bulb fly (*Leptohylemyia coarctata*)**
 BHC dressings against, 227
 effect of insecticides on, 227, 246, 9-20
 egg development, 252
 emergence dates, 252
Entomophthora spp. on, 261
 feeding, 251, 10-6
 infestation distribution, 252
 infestation measurement, 10-14
 movement of larvae, 250
 on Rothamsted farm, 252, 300
 seed dressings of insecticides for, 227
Septomyxa affinis spores as food, 251
 wheat extracts, larval response to, 208
- Wild oats (*Avena fatua*)**
 'Avadex BW' as herbicide for, 300
 competition with barley, 126
- Windbreaks, effect on insect distribution, 243–246**
- Wireworms (*Agriotes* spp.)**
 bait to control, 208, 9-18
 effect of cultivation on, 248
 insecticides for, 247, 9-19, 10-20
- Woburn**
 air pollution at, 174

INDEX

Numbers in *italics* refer to the Abstracts of Papers on pp. 362–428

Woburn (*contd.*):

bean weevils, 232
Direct Seeding Experiment, 160
effect of organic manures at, 57
effect of simazine on beans at, 67
field experiments, 281, 284–294, 303–307
grass leys, 59
IBP experiments with lucerne and grass, 105
Intensive Cereals Experiment, 154, 286, 288, 292
irrigation at 1960–69, 34, *1·9*
Ley-Arable Experiment, 162, 171, 191, 288
long-period manuring, value of residues, 2·9, *2·10*, *2·11*, *2·12*, *2·13*
mineralisable N in soils, 61
nematodes at, 185, 188–195, 199–203
pesticides, assessment of as nematocides, 203
powdery mildew on cereals, 152
potato yields, effect of soil fumigation on, 171
Reference Experiments, 56
take-all on wheat, 154–158, 160, 162

Woburn (*contd.*):

uptake of available K by grass, *2·19*
weather, 304, 431

X-ray diffraction apparatus, 89

X-ray fluorescence analysis

in determining cation-exchange capacity, 90
in determining major elements in silicates, 90
in determining sulphur in soils, *3·5*
in determining trace elements, 90
in study of mercury content of seeds, 89
sulphur contamination in, *3·11*
thin windows for flow counters for, *3·6*

Xanthophylls and leaf pigments, 136

Yorkshire, soil survey in, 339

Zea mays. See Maize

Zeolites in South East England, 3·7

'Zinophos', effect on soil fauna, 160, 247