

REFERENCES

- Abbott A.J. and Atkin R.K.** (1987) *Improving Vegetatively Propagated Crops*. Academic Press, 416pp.
- Acock B.** (1980) Analysing and predicting the response of the glasshouse crop to environmental manipulation. In: *Opportunities for Increasing Crop Yields*, (eds) R.G. Hurd, P.V. Biscoe and C. Dennis, pages 131-148, Pitman Publishing Ltd, London.
- Addiscot T.M. and Whitmore A.P.** (1987) Computer simulation of changes in soil mineral nitrogen and crop nitrogen during autumn, winter and spring. *J. Agric. Sc., Cambridge*, **109**, 141-157.
- Agricultural Advisory Council** (1970) *Modern farming and the soil*. MAFF report.
- Agricultural and Food Research Council** (1988). The 'Brimstone Farm' Drainage/Cultivation Experiment. Rothamsted unpublished report. 1-18.
- Alexander M.** (1977), *An Introduction to Soil Microbiology*, 2nd Edition. Wiley, New York.
- Alphey T.J.W. and Taylor C.E.** (1986) *European Atlas of the Longidoridae and Trichodoridae*. Dundee, Scottish Crop Research Institute 123pp.
- Anderson I.** (1989) Problems for primary industries. *New Scientist*. 7th October, 10-11.
- Angell J.K.** (1986) Annual and seasonal global temperature changes in the troposphere and low stratosphere. 1960-1985. *Mon. Weather Rev.*, **114**, 1922-1930.
- Apel P.** (1989) Influence of CO₂ on alter stomatal numbers. *Biologia Plantarum* **31**, 72-74
- Asher M.J.C., Thomas W.T.B. and Thomas C.E.** (1983) The genetical control of incomplete forms of resistance to *Erysiphe graminis* in spring barley. *Ann. Appl. Biol.* **103**, 149- 56.
- Baillie M.G.L. and Munro M.A.R.** (1988) Irish tree-rings, Santorini and volcanic dust veils. *Nature* **332**, 344-346.
- Baker C.R.B.** (1972) An approach to determining potential pest distribution. *OEPP/EPPO Bulletin* **3**, 5-22.
- Baker C.R.B.** (1980) Some problems in using meteorological data to forecast the timing of insect life cycles. *EPPO Bulletin* **10**, 83-91.
- Baker B., Schell J., Lory H. and Fedoroff N.V.** (1986) Transposition of maize controlling element activator in tobacco. *Proc. Nat. Acad. Sc., USA*, **83**, 4844-4848.
- Bale J.S., Harrington R. and Clough M.S.** (1988) Low temperature mortality of the peach-potato aphid, *Myzus persicae*. *Ecological Entomology* **13**, 121-129.

- Barlow P.W.** (1986). The cellular organisation of roots and its response to the physical environment. In: P.J. Gregory, J.V. Lake & D.A. Rose. (Eds.), *Root development and function*. pp. 1-26. Cambridge University Press, Cambridge. xiii + 206 pp.
- Barracough D. and Smith M.J.** (1987) The estimation of mineralisation, immobilisation and nitrification in nitrogen-15 experiments using computer simulation. *J. Soil Sc.* **38**, 519-530.
- Bengough A.G.** (1988). *The use of penetrometers for estimating mechanical impedance to root growth*. Unpublished Ph.D. Thesis, Aberdeen University, Aberdeen pp. 248.
- Berry J.A. & Bjorkman O.** (1980) Photosynthetic response and adaptation to temperature in higher plants. *Ann. Rev. Plant Physiol.* **31**, 491-543.
- Black C.C. jnr** (1986) Effects of CO₂ concentration on photosynthesis and respiration of C₄ and CAM plants. In: Enoch H.J., Kimball B.A. (eds) *Carbon Dioxide Enrichment of Greenhouse Crops*. vol. II pp 29 - 40, CRC press, inc., Florida.
- Bolin B., Doos B.R., Jager J. and Warrick R.A.** (eds). (1986) *The Greenhouse Effect, Climatic Change and Ecosystems. A Synthesis of Present Knowledge*, Wiley, Chichester.
- Brady N.C.** (1974). *The nature and properties of soils*. MacMillan, London.
- Bravdo B.A.** (1986) Effects of CO₂ enrichment on photosynthesis in C₃ plants. In: Enoch H.J., Kimball B.A. (eds) *Carbon Dioxide Enrichment of Greenhouse Crops*. vol. II pp 13-27, CRC press, inc., Florida.
- Brennan R.M., Fitt B.D.L., Colhoun J. and Taylor G.S.** (1986) Factors affecting the germination of *Septoria nodorum* pycnidiospores. *Journal of Phytopathology* **117**, 49-53.
- Broecker W.S.** (1974) *Chemical Oceanography*. Harcourt Brace Jovanovich, New York.
- Broecker W.S., Peteet D.M. and Rind D.** (1985) Does the ocean-atmosphere system have more than one stable mode of operation? *Nature* **315**, 21-26.
- Brune U., Hahn V. and Friedt W.** (1989) Application of anther culture in breeding of mustard species (*Sinapis alba*, *Brassica juncea*). In: Poster abstracts part II (25-27), XIIth Eucarpia Congress, Gottingen, FRG.
- Buchan G.D.** (1982). Predicting bare soil temperature. I. Theory and models for the multi-day mean diurnal variation. *Journal of Soil Science* **33**, 185-197.
- Cadman C.H. and Chambers J.** (1960) Factors affecting the spread of aphid-borne viruses in potato in eastern Scotland. III. Effects of planting date, roguing and age of crop on the spread of potato leafroll and Y viruses. *Annals App. Biol.*, **48**, 729-738.
- Caemmerer S. von and Farquhar G.D.** (1981) Some relationships between the biochemistry of photosynthesis and the gas exchange of leaves. *Planta* **153**, 376-387.

- Calkins J.** (ed.) (1982) *Marine Sc. 1*, Nato Conf. Ser IX, Plenum, N.Y.
- Campbell G.S.** (1977). Thermal adaptations of phosphate absorption of plants along a latitudinal gradient. In: J.K. Marshall. (Ed.) *The below ground ecosystem: a synthesis of plant-associated processes*. pp. 99-107. Range Science Department, Science Series No. 26. Colorado State University, Fort Collins, Colorado.
- Campbell C.A. & Biederbeck V.O.** (1982). Changes in mineral-N and numbers of bacteria and actinomycetes during two years under wheat-fallow in Southern Saskatchewan. *Canadian Journal of Soil Science* 62, 125-137.
- Carberry P.S. and Campbell L.C.** (1985) The growth and development of pearl millet as affected by photoperiod. *Field Crops Research*, 11, 207-217.
- Carter N., Dixon A.F.G. and Rabbinge R.** (1982) *Cereal Aphid Populations; Biology, Simulation and Prediction*. Pudoc, Wageningen.
- Chapin, F.S.** (1977). Thermal adaptations of phosphate absorption in plants along a longitudinal gradient. In: J.K. Marshall (ed.) *The below-ground ecosystem: A synthesis of plant-associated processes*. Range Science Department, **Science Series No. 26**, 39-51, Colorado State University, Fort Collins.
- Charleson R.J., Lovelock J.E., Andreae M.O. and Warren S.G.** (1987) Oceanic phytoplankton, atmospheric sulphur, cloud albedo and climate. *Nature* 326, 655-661.
- Cheeseman C.L., Wilesmith J.W. and Stuart F.A.** (1989) Tuberculosis: The disease and its epidemiology in the badger, a review. *Epidem. Inf.* 103, 113-125.
- Clark M.D. & Gilmour J.T.** (1983). The effect of temperature on decomposition at optimum and standard soil water contents. *Soil Science Society of America, Journal* 47, 927-929.
- Coakley S.M.** (1988) Variation in climate and prediction of disease in plants. *Annual Review of Phytopathology* 26, 163-181.
- Collier R.H. and Finch S.** (1983) Effects of intensity and duration of low temperatures in regulating diapause development of the cabbage root fly (*Delia radicum*) *Entomologia experimentalis et applicata* 34, 193-200.
- Cooper A.J.** (1973). *Root temperature and plant growth*. Research review No. 4. Commonwealth Bureau of Horticulture and Plantation Crops, East Malling.
- Cowan L.R.** (1977) Stomatal behaviour and environment. In: Preston R.D. & Woolhouse H. W. (eds.) *Advances in Botanical Research IV*. pp 117-228.
- Cowan L.R.** (1986). Economics of carbon fixation in higher plants. In: T.J. Givnish (Ed.) *On the economy of plant form and function*. pp. 133-170. Cambridge University Press, Cambridge. xvii + 717 pp

- Cowan I.R.** (1982) Regulation of water use in relation to carbon gain in higher plants. In: Lange O.L., Nobel P.S., Osmond C.B., & Ziegler H. (eds.) *Physiological Plant Ecology II Water Relations and Carbon Assimilation*. Springer-Verlag. pp 589-613.
- Cowan I.R.** (1986). Economics of carbon fixation in higher plants. In: T.J. Givnish (Ed.) *On the economy of plant form and function*. pp. 133-170. Cambridge University Press, Cambridge. xvii + 717 pp
- Cowan I.R. and Farquhar G.D.** (1977) Stomatal function in relation to leaf metabolism and environment. In: Jennings D.H. (ed.) *Integration of Activity in the Higher Plant*. CUP, pp 471-505.
- Cumbus I.P. & Nye P.H.** (1982). Root zone temperature effects on growth and nitrate absorption in rape (*Brassica napus* var. Emerald). *Journal of Experimental Botany* **33**, 1138-1146
- Cure J.D. and Acock B.** (1986) Crop responses to carbon dioxide. *Agric. For. Meteorol.* **38**, 127-145.
- Davidson R.L.** (1969). Effect of root:leaf temperature differentials on root:shoot ratios in some pasture grasses and clover. *Annals of Botany* **33**, 561-569.
- Davies D.B.** (1975). Field behaviour of medium textured and 'silty' soils. In: *Soil physical conditions and crop production*. Technical Bulletin, M.A.F.F., **29**, 52-71.
- Del Castillo D., Acock B., Reddy V.R. & Acock M.** (1989). Elongation and branching of roots on soybean plants in a carbon dioxide-enriched aerial environment. *Agronomy Journal* **81**, 692-695.
- Delucia E.H., Sasek T.W. and Strain B.R.** (1985) Photosynthetic inhibition after long-term exposure to elevated levels of atmospheric carbon dioxide. *Photosynthetic Research* **7**,
- Dennis M.J.** (1986) The effects of temperature and humidity on some animal diseases - a review. *Brit. Vet. J.* **142**, 427-485. 175-184.
- Dewar A.M. and Carter N.** (1984) Decision trees to assess the risk of cereal aphid outbreaks. *Bulletin of Entomological Research*, **74**, 387-398.
- Dewar A.M., Tatchell G.M. and Turl L.A.D.** (1984) A comparison of cereal-aphid migrations over Britain in the summers of 1979 and 1982.
- Dickson R.E. and Cicerone R.J.** (1986) Future global warming from atmospheric trace gases. *Nature* **319**, 109-114.
- Doughty C.C., Crandall P.C. and Shanks C.H.** (1972) Cold injuries to red raspberries and the effects of premature defoliation and mite damage. *J. Am. Soc. Hort. Res.* **97**, 670-673.
- Druffel E.R.M. and Benavides L.M.** (1986) Input of excess carbon dioxide to the surface ocean based on $^{13}\text{C}/^{12}\text{C}$ ratio in a banded Jamaican sclerosponge. *Nature*, **321**, 58-61.

- Duncan J.M. and Cowan J.B.** (1980) Effect of temperature and soil moisture content on persistence of infectivity of *Phytophthora fragariae* in naturally infested field soil. *Trans. Brit. Myc. Soc.* **75**, 133-139.
- Duncan J.M. and Kennedy D.M.** (1989) The effect of waterlogging on *Phytophthora* root rot of raspberry. *Plant Pathology* **38**, in press.
- Duniway J.M.** (1976) Movement of zoospores of *Phytophthora cryptogea* in soils of various textures and matric potentials. *Phytopathology* **66**, 877 - 882.
- Duniway J.M.** (1977) Movement of zoospores of *Phytophthora cryptogea* in soils of various textures and matric potentials. *Phytopathology* **66**, 877-882.
- Dunn J.A. and Kempton D.P.H.** (1977) The development on potatoes of a glasshouse strain of *Myzus persicae* resistant to organophosphorus insecticides. *Annals of Applied Biology* **85**, 175-179.
- Dunwell J.M.** (1985) Anther and ovary culture . In: *Cereal tissue and Cell Culture*. S.W.J. Bright and M.J.K. Jones (eds.) Martinus Nijhoff, 1-44
- Ellis R.P.** (1986) Spring barley cultivars bred at the Scottish Crop Research Institute. *Crop Res. (Hort., Res.)* **26**, 57-77.
- Ellis R.P. and Kirby E.J.M.** (1980) A comparison of spring barley grown in England and in Scotland 2. Yield and its components. *J. agric. Sci., Camb.*, **95**, 111-115.
- Ellis R.P. and Russell G.** (1984) Plant development and grain yield in spring and winter barley. *Journal of Agricultural Science, Cambridge*, **102**, 85-95.
- Fajen E.D., Bowers M.D. and Bazzaz** (1989). The effects of enriched carbon dioxide atmospheres on plant-herbivore interactions. *Science* **243**, 1198-1200.
- Farquhar G.D. and Caemmerer S. von** (1982) Modelling of photosynthetic response to environmental conditions. In: Lange O.L., Nobel P.S., Osmond C.B., & Ziegler H. (eds.) *Physiological Plant Ecology II Water Relations and Carbon Assimilation*. Springer-Verlag. pp 550-587.
- Farquhar G.D., Caemmerer S. von and Berry J.A.** (1980) A biochemical model of photosynthetic CO₂ assimilation in leaves of C₃ species. *Planta* **149**, 78-90.
- Farquhar G.D. and Sharkey T.D.** (1982) Stomatal conductance and photosynthesis. In: Briggs W.R., Green P.B., and Jones R.L. (eds.) *Ann. Rev. Plant Physiol.* **33**, pp. 317-345.
- Farquhar G.D. and Richards R.A.** (1984) Isotopic composition of plant carbon correlates with water-use efficiency of wheat genotypes. *Aust. J. Plant Physiol.* **11**, 539-552.
- Finch S.** (1977) Monitoring insect pests of cruciferous crops. *Proceedings 1977 British Crop Protection Conference-Pests and Diseases* 219-226.

- Finch S. and Collier R.H.** (1988) Forecasting the times of attack of *Delia radicum* on brassica crops: Major factors influencing the accuracy of the forecast and the effectiveness of control. In *Progress on pest management in field vegetables* pp 49-54. Eds R. Cavalloro & C. Pelerents. A.A. Balkema, Rotterdam. x + 302pp.
- FitzPatrick E.A.** (1983) *Soils. Their formation, classification and distribution*. Longman.
- Folland C.K., Palmer T.N. and Parker D.E.** (1986) Sahel rainfall and worldwide sea temperatures 1901-1985. *Nature* **320**, 602-606.
- Ford M.A. and Thorne G.R.** (1967) Effect of CO₂ concentration on growth of sugar-beet, barley, kale and maize. *Annals. of Bot.* **31**, 629-644.
- Foster G.N.** (1984) Monitoring and forecasting outbreaks of turnip flea beetles in the West of Scotland, 1978-1983. *Proceedings Crop Protection in Northern Britain 1984*, 222-227.
- Francey R.J. and Farquhar G.D.** (1982) An explanation of ¹³C/¹²C variations in tree rings. *Nature* **297**, 28-31.
- Gallagher J.N.** (1979) Field studies of cereal leaf growth. I. Initiation and expansion in relation to temperature and ontogeny. *J. Exp. Bot.* **30**, 625-636.
- Gifford R.M.** (1979) Growth and yield of CO₂ enriched wheat under water-limited conditions. *Austr. J. Plant Physiol.* **6**, 367-378.
- Giles R.J., Ellis R.P. and Watson W.** (1981) An assessment of rapid malting quality tests: results from the barley collection at the Scottish Crop Research Institute. *Barley Genetics IV. Proceedings of the fourth barley genetic symposium Edinburgh*, pp578-85.
- Gordon S.C., Barrie I.A. and Woodford J.A.T.** (1989) Predicting spring oviposition by raspberry cane midge from accumulated derived soil temperatures. *Annals of Applied Biology* **115** (In press).
- Gordon S.C., Woodford J.A.T. and Barrie I.A.** (1989) Monitoring pests of red raspberry in the United Kingdom and the possible implementation of an integrated pest management system. In: *Monitoring and Integrated Management of Arthropod Pests of Small Fruit Crops*. (eds) N.J. Bostanian, L.T. Wilson & T.J. Dennehy. Intercept Press.
- Goudriaan J. and Bijlsma R.J.** (1987) Effect of CO₂ enrichment on growth of faba beans at two levels of water supply. *Neth. J. Agric. Science* **35**, 189-191.
- Goudriaan J. and van Laar H.H.** (1978) Calculation of daily totals of the gross CO₂ assimilation of leaf canopies. *Netherlands Journal of Agricultural Science*, **26**, 373-382.
- Grace J.** (1987) Climatic tolerance and the distribution of plants. In: I.H. Rorison, J.P. Grime, R. Hunt, G.A.F. Hendry and D.H. Lewis (Eds.) *Frontiers of comparative plant ecology*. 113-130. Academic Press, London.

- Gradwell M.W.** (1966). Soil moisture deficiencies in puddled pastures. *New Zealand Journal of Agricultural Research*, 9, 127-136.
- Gregory P.J. and Brown S.C.** (1989) Root growth, water use and yield of crops in dry environments: what characteristics are desirable? *Aspects of Applied Biology*, 22, *Roots and the Soil Environment*. 235-243.
- Griffin D.M.** (1972). *Ecology of soil fungi*. Chapman and Hall, London.
- Grime J.P.** (1979). *Plant strategies and vegetation processes*. Wiley, Chichester. xi + 222 pp.
- Grime J.P., Hodgson J.G. & Hunt R.** (1988). *Comparative plant ecology: a functional approach to common British species*. Unwin & Hyman, London.
- Hall A.E.** (1981) Adaptation of annual plants to drought in relation to improvements in cultivars. *Hort. Sc.* 16, 37-38.
- Hammer C.U., Clausen H.B. and Dansgaard W.** (1980) Greenland ice sheet evidence of post-glacial volcanism and its climatic impact. *Nature* 288, 230-235.
- Hansen J., Wang W.C., and Lacis A.** (1978) Mount Agung eruption provides test of a global climate perturbation. *Science* 199, 1065-1068.
- Hansen J., Russell G., Rind D., Stone P., Lacis A., Lebedeff S., Ruedy R. and Travis L.** (1983) Efficient three-dimensional global models for climate studies: Models I and II. *Mon. Weather Rev.* 111, 609-662.
- Hansen J., Lacis A., Rind D., Russell G., Stone P., Fung I., Ruedy R. and Lerner J.** (1984) Climate sensitivity: Analysis of feedback mechanisms., In: *Climatic Processes and Climate Sensitivity*, *Geophys. Mono.* 29, Maurice Ewing vol. 5.
- Hansen J., Russell G., Lacis A., Fung I., Rind D. and Stone P.** (1985) Climate response times: Dependence on climate sensitivity and ocean mixing. *Science* 229, 857-859.
- Hansen J., Fung I., Lacis A., Rind D., Lebedeff S., Ruedy R., Russell G. and Stone P.** (1988) Global climate changes as forecast by the Goddard Institute for Space Studies three dimensional Model. *J. Geophys. Res.* 93 No. D8 9341-9364.
- Harborne J.B.** (1987) Chemical systems in the ecosystem. *Ann. Bot. suppl.* 4, 39-58.
- Harrington R. and Cheng Xia-Nian** (1984) Winter mortality, development and reproduction in a field population of *Myzus persicae* (Sulz.) in England. *Bulletin of Entomological Research* 74, 633-640.
- Harris R.F.** (1980) Effect of water potential on microbial growth and activity. In: J.F. Parr, W.R. Gardner and L.F. Elliott (Eds.) *Water potential relations in soil microbiology*. Soil Science Society of America, Wisconsin. 23-95.

- Harrod B.** (1975). Field behaviour of Light Soils. In: *Soil physical conditions and crop production*. Technical Bulletin, M.A.F.F., 29, 22-51.
- Hatch M.D. and Osmond C.B.** (1976) Compartmentation and transport in C4 photosynthesis. In: Heber U., Stocking C.R. (eds.). *Transport in Plants III. Encyclopedia of Plant Physiology* n.s. vol. III, pp 144-184.
- Heal O.W. & French B.** (1974). Decomposition of organic matter in tundra. In: Holding A.J., Heal O.W., MacLean S.F. and Flanagan P.W. (Eds.) *Soil Organisms and Decomposition in Tundra*, pp. 279-310. Tundra Biome Steering Committee, Stockholm.
- Heath J., Brown D.J.F. & Boag B.** (1977) Provisional Atlas of the Nematodes of the British Isles. *Biological Records Centre*, Abbots Ripton 76pp.
- Hepting G.H.** (1963) Climate and forest diseases. *Ann. Rev. Phytopath.* 1, 31-50.
- Herlitzius H.** (1987). Decomposition in five woodland soils: relationships with some invertebrate populations and with weather. *Biology and Fertility of Soils* 3, 85-89.
- Hodgkin T.** (1988) In vitro pollen selection in *Brassica napus*. In: *Proceedings of 10th International Symposium on Sexual Reproduction in Flowering Plants* (ed. M. Cresti) Springer-Verlag, Berlin.
- Howell P.J.** (1973) The relationship between winter temperatures and the extent of potato leafroll virus in seed potatoes in Scotland. *Potato Research* 16, 30-42.
- Howell P.J.** (1977) Recent trends in the incidence of aphid-borne viruses in Scotland. *Proceedings of a Symposium on Problems of Pest and Disease Control in Northern Britain*. Dundee, March 1977, pp 26-28.
- Hubick K.T., Farquhar G.D. and Shorter T.** (1986) Correlation between water-use efficiency and carbon isotope discrimination in diverse peanut (*Arachis*) germplasm. *Aust. J. Plant Physiol.* 13, 803-816.
- Hughes M.K.** (1988) Ice-layer dating of eruption at Santorini. *Nature* 335, 211-212.
- Humboldt A. von** (1848) *Cosmos - A sketch of a physical description of the universe*. Bohn's Scientific Library, Covent Garden, London.
- Hurst G.W.** (1975) Meteorology and the Colorado potato beetle. *World Meteorological Organisation Technical Note* No. 137 51pp.
- Idso S.B., Kimball B.A. and Mauney J.R.** (1988) Effects of atmospheric CO₂ enrichment on root:shoot ratios of carrot, radish, cotton and soybean. *Agriculture, Ecosystems and Environment* 21, 293-299.
- Imai K., Coleman D.F. and Yanagisawa T.** (1984) Elevated atmospheric partial pressure of carbon dioxide and dry matter production of Cassava (*Manihot esculenta* Crantz). *Japanese Journal of Crop Science* 53, 479-485.

- Innes N.L.** (1989) Biotechnology and plant breeding. *Ag. Biotech. News and Inf.* **1**, 27-32.
- Inram, H. Parkinson D. and Domsch K.H.** (1989). Influence of macroclimate in soil microbial biomass. *Soil Biology and Biochemistry* **21**, 211-221.
- Ivarson K.C. and Sowden F.J.** (1970). Effect of frost action and storage of soil at freezing temperatures on the free amino acids, sugars and respiratory activity of soils. *Canadian Journal of Soil Science* **50**, 191-198.
- Jacobsen H.J. and Lehming-Martens R.** (1989) Regeneration of pea from protoplasts. In: *Poster abstracts part II* (25-11) XIIth Eucarpia Congress, Gottingen, FRG.
- Jennings D.L.** (1988) *Raspberries and blackberries: their breeding, diseases and growth.* Academic Press, London.
- Jenny J.** (1961). Derivation of state factor equations of soils and ecosystems. *Soil Science Society America, Proceedings* **25**, 385-388.
- Johns G.G. and Lazenby A.** (1973) Effect of irrigation and defoliation on the herbage production and water-use efficiency of four temperate pasture species. *Austr. J. Agr. Res.* **24**, 797-808.
- Jones F.G.W. and Perry J.N.**, (1978) Modelling populations of cyst-nematodes (*Nematoda: Heteroderidae*). *Journal of Applied Ecology* **15**, 349- 371.
- Jones P.D., Wigley T.M.L., Wright P.B.** (1986) Global temperature variations between 1861 and 1984. *Nature* **322**, 430-434.
- Jones P.D., Wigley T.M.L., Folland C.K., Parker D.E., Angell J.K., Lebedeff S. and Hansen J.E.** (1988) Evidence for global warming in the past decade. *Nature* **322**, 790.
- Kemp D.R.** (1984) Temperate pastures. In: Pearson C.J. (ed) *Control of crop productivity*. pp 159-184.
- Kempton R.A. and Talbot M.** (1988) The development of new crop varieties. *J. Roy. stat. Soc.* **151**, 327-341
- Kieft T.L., Soroker E. and Firestone, M.K.** (1987). Microbial biomass response to a rapid increase in water potential when dry soil is wetted. *Soil Biology and Biochemistry* **19**, 119-126.
- van Keulen H. and Seligman N.G.** (1987) *Simulation of water use, nitrogen nutrition and growth of a spring wheat crop*. pp 310, Pudoc, Wageningen.
- Kimball B.A.** (1983) Carbon dioxide and agricultural yield: an assemblage and analysis of 430 prior observations. *Agronomy Journal* **75**, 779-788.

- Kimball B.A.** (1986) Influence of elevated CO₂ on crop yield. In: Enoch H.J., Kimball B.A. (eds) *Carbon Dioxide Enrichment of Greenhouse Crops*. vol. II pp 105 - 115, CRC press, inc., Florida.
- Lal R.** (1989) Conservation tillage for sustainable agriculture: Tropics versus temperate environments. *Advances in Agronomy*, **42**, 85-197.
- LaMarche V.C. and Hirschboeck K.K.** (1984) Frost rings in trees as records of major volcanic eruptions. *Nature* **307**, 121-126.
- Lamb D.J.** (1984) The potential of oil seed rape as a host for the first generation of cabbage root fly, *Delia radicum* (L.). *Crop Research* **24**, 61-63.
- Lawrence T.** (1984) *Collection of crop germplasm. The first ten years 1974-1984*. International Board for Plant Genetic Resources, Rome.
- van Lenteren J.C. and Woets J.** (1988) Biological and integrated pest control in greenhouses. *Annual Review of Entomology* **33**, 233-269.
- Linehan D.J.** (1989). Mobilization of nutrients in the rhizosphere and their uptake by plants. *Aspects of Applied Biology* **21**, in press.
- Lorenz E.N.** (1968) Climatic determinism. *Meteorol. Monograph*. **30**, 1-3.
- Ludlow M.M. and Muchow R.C.** (1988) Critical evaluation of the possibilities for modifying crops for high production per unit of precipitation. In: *Drought Research Priorities for the Dryland tropics*. F.R. Bidinger and C. Johansen (eds.), ICRISAT, India, 179-217.
- Luo J. and Wu R.** (1988) A simple model for the transformation of rice via the pollen-tube pathway. *Plant Mol. Biol. Rep.* **63**, 165-174.
- Lynch J.** (1989) Transcript of the BBC Horizon programme 'Time of Darkness', produced by John Lynch.
- Lyon G.D.L.** (1984) Comparisons between phytoalexin concentrations and the extent of rooting of potato tubers inoculated with *Erwinia carotovora sub sp. atroseptica*, *E. carotovora sub.sp. carotovora* or *E. chrysanthemi*. *Phytopathologisch Zeitschrift* **111**, 236-243.
- Mabbutt J.A.** (1984) *Environmental Conservation*, **11**, 103-113.
- Macduff J.H.** (1989). Growth and nutrient uptake in response to root temperature. *Aspects of Applied Biology* **21**, in press.
- Madsen E.** (1973) Effect of CO₂-concentration on morphological, histological, cytological and physiological processes in tomato plants. *Acta Agricultura Scandinavica* **23**, 241-246.

- McGarry D.** (1989). The effect of wet cultivation on the structure and fabric of a vertisol. *Journal of Soil Science* **40**, 199-207.
- Mackerron D.K.L. and Jefferies, R.A.** (1988) *Annual Report of the Scottish Crop Research Institute*, p145
- Mackerron D.K.L. and Waister P.D.** (1985) A simple model of potato growth and yield. 1. Model development and sensitivity analysis. *Journal of Agriculture and Forest Meteorology* **34**, 240-252.
- Manabe S. and Wetherald R.T.** (1967) Thermal equilibrium of the atmosphere with a given distribution of relative humidity. *J. Atmos. Sci.* **24**, 241-259.
- Manabe S. and Wetherald R.T.** (1975) The effects of doubling the CO₂ concentration on the climate of a general circulation model. *J. Atmos. Sci.* **32**, 3-15.
- Manabe S. and Wetherald R.T.** (1987) Large scale changes in soil wetness induced by an increase in atmospheric CO₂. *J. Atmos. Sci.* **44**, 1211-1235.
- Marschner H.** (1986). *Mineral nutrition of higher plants*. Academic Press, London. xii + 674 pp.
- Marshall B. and Biscoe P.V.** (1981) Environmental and physiological factors affecting assimilate supply during grain growth. In: *Opportunities for Manipulation of Cereal Productivity*, Eds A.F. Hawkins and B. Jeffcoat. British Plant Growth Regulator Group, Monograph 7, 179-192.
- Marshall B. and Thompson R.** (1987a) A model of the influence of air temperature and solar radiation on the time to maturity of calabrese *Brassica oleracea*. *Annals of Botany* **60**, 513-519.
- Marshall B. and Thompson R.** (1987b) Applications of a model to predict the time to maturity of calabrese *Brassica oleracea*. *Annals of Botany*, **60**, 521-529.
- Marshall B. and Barker H.** (1988) Effects of potato leafroll virus on the crop processes leading to tuber yield in potato cultivars which differ in tolerance of infection. *Annals of Applied Biology* **113**, 297-305.
- Martens J.W., McKenzie R.H. and Green G.J.** (1967) Thermal stability of stem rust resistance in oat seedlings. *Canadian Journal of Botany* **45**, 451-458.
- Mellor P.S., Boorman J.P.T., Wilkinson P.J. and Martinez-Gomez F.** (1983) Potential vectors of bluetongue and African horse sickness viruses in Spain. *Vet. Rec.* **112**, 229-230.
- Messenger P.S.** (1959) Bioclimatic studies with insects. *Annual Review of Entomology* **4**, 183-206.
- Milford G.F.J., Pocock T.O., and Riley J.** (1985a) An analysis of leaf growth in sugar beet.

- O'Leary J.W. and Knecht G.N.** (1981) Elevated CO₂ concentration increases stomate numbers in *Phaseolus vulgaris* leaves. *Botanical Gazette* **142**, 438-441
- O'Neill E.G., Laxmo R.J. and Norby R.J.** (1987). Elevated atmospheric CO₂ effects on seedling growth, nutrient uptake and rhizosphere bacterial populations of *Liriodendron tulipifera*. *Plant and Soil* **104**, 3-11. numbers in *Phaseolus vulgaris* leaves. *Botanical Gazette* **142**, 438-441
- Oeschger H. and Dutsch H.U.** (1989) Ozone and the greenhouse effect. *Nature*, **399**, 19.
- Ong C.K.** (1983a) Response to temperature in a stand of pearl millet. I. Vegetative development. *J. Exp. Bot.* **34**, 322-336.
- Ong C.K.** (1983b) Response to temperature in a stand of pearl millet. II. Reproductive development. *J. Exp. Bot.* **34**, 337-348.
- Ong C.K. and Everard A.** (1979) Short day induction of flowering in pearl millet (*Pennisetum typhoides*) and its effect on plant morphology. *Experimental Agriculture* **15**, 401-410.
- Orchard V.A. and Cook F.J.** (1983). Relationship between soil respiration and soil moisture. *Soil Biology Biochemistry* **15**, 447-454.
- Osmond C.B., Winter K. and Ziegler H.** (1982) Functional significance of different pathways of CO₂ fixation in photosynthesis. In: *Lange O.L., Nobel P.S., Osmond C.B., & Ziegler H. (eds.) Physiological Plant Ecology II Water Relations and Carbon Assimilation*. Springer-Verlag. pp 550-587.
- O'Toole J.C. and Bland W.L.** (1987). Genotypic variation in crop plant root systems. *Advances in Agronomy* **41**, 91-145.
- Patterson H.D., Silvey V., Talbot M. and Weatherup S.T.C.** (1977) Variability of yields of cereal varieties in U.K. trials. *J. Agric. Sc., Camb.* **89**, 239-245.
- Pearman G.L., Etheridge D., de Silva F. and Fraser P.J.** (1986) Evidence for changing concentrations of atmospheric CO₂, N₂O and CH₄ from air bubbles in Antarctic ice. *Nature* **320**, 248-250.
- Pearson R.W., Radcliffe L.F. and Taylor H.M.** (1970). Effect of soil temperature, strength and pH on cotton seedling root. *Agronomy Journal* **62**, 243-246.
- Perombelon M.C.M.** (1976) Effects of environmental factors during the growing season on the level of potato tuber contamination by *Erwinia carotovora*. *Phytopathologische Zeitschrift* **85**, 97-116.
- Persson T.** (1989). Role of soil animals in C and N mineralization. *Plant and Soil* **115**, 241-245.
- Philander S.G.H.** (1983) El Niño southern oscillation phenomena. *Nature* **302**, 295-301.

- Pitcher R.S.** (1952) Observations on the raspberry cane midge (*Thomasiniana theobaldi* Barnes) I. Biology. *Journal of Horticultural Science* **27**, 71-94.
- Porter J.R. and 19 others**, (1987) An analysis of morphological development stages in Avalon winter wheat crops with different sowing dates and at ten sites in England and Scotland. *Journal of Agricultural Science, Cambridge* **109**, 107-121.
- Rabbinge R.**, (1986) The bridge function of crop ecology. *Netherlands Journal of Agricultural Science* **3**, 239-251.
- Ramanathan V., Cess R.D., Harrison E.F., Minnis P., Barkstrom B.R., Ahmed E. and Hartman D.** (1989) Cloud radiative forcing and climate: Results from the Earth radiation budget experiment. *Science* **243**, 57-63.
- Rampino M.R., Self S. and Fairbridge R.W.** (1979) Can rapid climate change cause volcanic eruptions? *Science* **206**, 826-829.
- Rampino M.R. and Stothers R.B.** (1985) Climatic effects of volcanic eruptions. *Nature* **313**, 272.
- Rasool S.I., de Bergh C.** The runaway greenhouse and the accumulation of CO₂ in the Venus atmosphere, *Nature* **226**, 1037.
- Remanandan P., Sastry D.V.S.S.R. and Mengesha M.H.** (1988) *ICRISAT Pigeonpea Germplasm Catalog: Evaluation and Analysis*. ICRISAT, India.
- Reynolds M.P. and Ewing E.E.** (1989). Effects of high air and soil temperature stress on growth and tuberization in *Solanum tuberosum*. *Annals of Botany* **64**, 241-247.
- Rhoades D.F.** (1985) Offensive-defensive interactions between herbivores and plants: Their relevance in herbivore population dynamics and ecological theory. *American Naturalist* **125**, 205-238.
- Robert Y.** (1987) Forecasting annual crop pests: Advantages and limitations. In: *Rational pesticide usage. Proceedings of the Ninth Long Ashton Symposium*. Eds. K.J. Brent & R.K. Atkin. Cambridge University Press. pp 269-283.
- Roberts L.** (1987) Coral bleaching threatens Atlantic reefs. *Science* **238**, 1228-1229.
- Robinson D.** (1988). Optimal relations between root length and nutrient inflow rate in plant root systems. *Journal of Theoretical Biology* **135**, 359-370.
- Robinson S.P. and Walker D.A.** (1981) Photosynthetic carbon reduction cycle. In: Hatch M.D., Boardman R.K. (eds) *The Biochemistry of Plants. vol 8, Photosynthesis*. pp 194-236. Academic Press, N.Y.
- Robock A.** (1989) Satellite data contamination. *Nature* **341**, 695.

- Rorison I.H., Peterkin J.H. and Clarkson D.T.** (1983). Nitrogen source, temperature and the growth of herbaceous plants. In: *Nitrogen as an ecological factor*. pp. 189-209. Eds. J.A. Lee, I.H. Rorison and S. McNeill. Blackwell Scientific Publications, Oxford.
- Rorison I.H., Sutton F. and Hunt R.** (1986). Local climate, topography and plant growth in Lathkill Dale NNR. I. A twelve-year summary of solar radiation and temperature. *Plant, Cell and Environment* **9**, 49-56.
- Rotem J.** (1978) Climatic and weather influences on epidemics. In: *Plant Diseases: An Advanced treatise*. **2**, 317-337.
- Rotem J., Cohen Y., Spiegel S.** (1968) Effect of soil moisture on the predisposition of tobacco to *Peronospora tabacina*. *Plant Disease Reporter* **52**, 310-313.
- Rouse D.I.** (1988) Use of crop growth-models to predict the effects of disease. *Annual Review of Phytopathology* **26**, 183-201.
- Rovira A.D. and Greason E.L.** (1957) The effect of aggregate disruption and the activity of microorganisms in the soil. *Australian Journal of Agricultural Research*, **8**, 659-673.
- Rowan-Robinson M.** (1985) Fire and ice - the nuclear winter. Longmans.
- Rowell D.L.** (1988). Soil acidity and alkalinity. In: *Russell's soil conditions and plant growth*. pp. 844-898. Ed. A. Wild. Longman, London.
- Rowntree P.R., Callander B.A. and Cochrane J.** (1986). Modelling climate change, and some potential effects on agriculture in the U.K. *Journal of the Royal Agricultural Society of England*, in press.
- Royle D.J. Shaw M.W. and Cook R.J.** (1986) Patterns of development of *Septoria nodorum* and *S. tritici* in some winter wheat crops in Western Europe, 1981-83. *Plant Pathology* **35**, 466-476.
- Rudolf A.** (1984) *Byron's 'Darkness': Lost summer and nuclear winter*. Menard Press.
- Ryden J.C. and Ralston D.E.** (1987). The measurement of denitrification. In: *Gaseous loss of nitrogen from plant-soil systems*. pp. 91-132. Eds. J.R. Frevey and J.R. Simpson. Martinus Nijhoff/Junk, The Hague.
- Schneider S.H. and Thompson S.L.** (1988) Simulating the climatic effects of nuclear war. *Nature* **333**, 221-227.
- Schoeneweiss D.F.** (1975) Predisposition, stress and plant disease. *Annual Review of Phytopathology* **13**, 193-211
- Schwartz S.E.** (1988). Are global cloud albedo and climate controlled by marine phytoplankton? *Nature* **336**, 441

- Sear C.B., Kelly P.M., Jones P.D. and Goodess C.M.** (1987) Global surface-temperature responses to major volcanic eruptions. *Nature* **330**, 365-367.
- Serraf J., Sihachako D., Haicour R. and Ducreux G.** (1989) Somatic hybrid plants produced by electrofusion between *Solanum melongena* L. and *Solanum khasianum*. C.B. Clark (ed.) In: Poster Abstracts part II (25 - 26) XIIIth Eucarpia Congress Gottingen, FRG.
- Shaw M.W.** (1962) The diamond-back moth migration of 1958. *Weather* **17**, 221-234.
- Shaw M.J.** (1986) Effects of temperature and leaf wetness on *Pyrenophora teres* grown on barley cv. Sonja. *Plant Pathology* **35**, 294-309.
- Sheil R.S., Adey M.A. and Ladder M.** (1988). The effect of successive wet/dry cycles on aggregate size distribution in a clay texture soil. *Journal of Soil Science* **39**, 21-80.
- Siegenthaler U. and Oeschger H.** (1978) Predicting future atmospheric carbon dioxide levels. *Science* **199** 388-395.
- Silcock R.G. and Wilson D.** (1981) Effect of watering regime on yield, water use and leaf conductance of seven *Festuca* species with contrasting leaf ridging. *New Phytologist* **89**, 569-580.
- Simmonds N.** (1976) *Evolution of crop plants*. Longman, London.
- Sionit N., Strair R.B. and Hellmers H.** (1981) Effects of different concentrations of atmospheric CO₂ on growth and yield components of wheat. *J. Agric. Sc., Camb.* **97**, 335-339.
- Skinner G. and Finch S.** (1988) Oilseed rape crops as a source of cabbage root fly infestations for cruciferous vegetable crops. In: *Progress on pest management in field vegetables*. pp 61-66. Eds R. Cavalloro & C. Pelerents. A.A. Balkema, Rotterdam. x + 302pp.
- Smith L.P. and Thomas R.J.** (1972) Forecasting the spring hatch of *Nematodirus battus* by use of soil temperature data. *Vet. Rec.* **90**, 388-392.
- Smith L.P.** (1974) Meteorological factors of importance in biological systems. *Symposium of the British Society for Parasitology* **12**, 1-12.
- Soil Survey** (1973) *The classification of some British soils according to the comprehensive system of the United States*. pp227.
- Soil Survey Staff** (1975). Soil Taxonomy - A Basic System of Soil Classification for Making and Interpreting Soil Surveys. *Agriculture Handbook* 436, US Department of Agriculture, Washington, D.C.
- Soulsby E.J.L.** (1982) *Helminths, arthropods and protozoa of domesticated animals*. 7th Edition Bailliere Tindall, London

- Sparrow L.A.D.** (1974) Observations on aphid populations on spring sown cereals and their epidemiology in south-east Scotland. *Annals of Applied Biology* **77**, 79-84.
- Spelman M.J. and Manabe S.** (1984) Influence of oceanic heat transport upon the sensitivity of a model climate. *J. Geophys. Res.* **89** No. C1, 571-586.
- Spitters C.J.T. and Ward S.A.** (1989) Evaluation of breeding strategies for resistance to potato cyst nematodes using a population dynamic model. *Euphytica* (in press).
- Stenseth C.** (1977) Observations on the biology of the raspberry cane midge (*Thomasiniana theobaldi*) and the damage caused by it. *Forskning og Forsok i Landbruget* **28**, 267-275 (Norwegian).
- Stewart G.R. and Harker F.** (1980) Accumulation of amino acids and related compounds in relation to environmental stress. In: *The Biochemistry of plants vol. 5. Amino acids and derivatives*. P.K. Stumpf and E.E. Conn (eds.) pp 609-635.
- Stommel H. and Stommel E.** (1979) The year without a summer. *Sci. Am.* June 1979, 134-140.
- Stothers R.B.** (1984) The great Tambora eruption in 1815 and its aftermath. *Science* **224**, 1191-1198.
- Stoyanov D.** (1963) Studies on the raspberry cane midge *Thomasiniana theobaldi* Barnes in Bulgaria. *Izvestia Institut Zashtita na Rasteniata Kostinbrod* **4**, 41-66. (English abstract in *Review of Applied Entomology* (A) **53**, 170-171 (1965)).
- Strain B.R.** (1987). Direct effects of increasing atmospheric CO₂ on plants and ecosystems. *Trends in Ecology and Evolution* **2**, 18-21.
- Strong A.E.** (1989) Greater global warming revealed by satellite derived sea-surface temperature trends. *Nature* **338**, 642.
- Swift M.J., Heal O.W. and Anderson J.M.** (1979) *Decomposition in terrestrial ecosystems*. Blackwell, Oxford.
- Talbot M. and England F.** (1984) A comparison of cereal variety performance in National List and plant breeders' trials. *Journal of the National Institute of Agricultural Botany* **16**, 499-505.
- Taylor D.** (1988). *Plant strategies and the dynamics and structure of plant communities*. Princeton University Press, Princeton. xi + 360 pp.
- Taylor L.R. and French R.A.** (1975) The Rothamsted Insect Survey. *Report of Rothamsted Experimental Station for 1974*, pp104-106.
- Taylor H.M. and Ratliff L.F.** (1969) Root elongation rates of cotton and peanuts as a function of soil strength and soil water content. *Soil Science*, **108**, 113-119.

- Tilman D.** (1988) *Plant strategies and the dynamics and structure of plant communities*. Princeton University Press, Princeton.
- Tucker C.J., Fung I.Y., Keeling C.D. and Gammon R.H.** (1986) Relationship between atmospheric CO₂ variations and a satellite derived vegetation index. *Nature* **319**, 195-199.
- Turl L.A.D.** (1980) An approach to forecasting the incidence of potato and cereal aphids in Scotland. *EPPO Bulletin* **10**, 135-141.
- Turl L.A.D.** (1983) The effect of winter weather on the survival of aphid populations on weeds in Scotland. *EPPO Bulletin* **13**, 139-143.
- Turner J.R.G., Gatehouse C.M. & Corey C.A.** (1987) Does solar energy control organic diversity? Butterflies, moths and the British climate. *Oikos* **48**, 195-205.
- UNEP** (1986) *Farming systems: principles for improved food production and the control of soil degradation in the arid, semi-arid and humid tropics*. Expert meeting sponsored by UNEP, 20-30 June, 1973. ICRISAT, Hyderabad, India.
- Vanderplank J.E.** (1978) Genetic and molecular basis of plant pathogenesis. *Springer-Verlag* **102**, 371-382..
- van der Werf W.** (1988) *Yellowing viruses in sugar beet; epidemiology and damage*. Ph.D. Thesis, Agricultural University of Wageningen.
- van der Werf W., Rabbinge R. and Heijbroek W.** (1986) Spring invasion of *Heterodera schachtii* in sugar beet; a simulation study. *Netherlands Journal of Plant Pathology*, **2**, 33-42.
- Weste G. and Marks G.C.** (1987) The biology of *Phytophthora cinnamomi* in Australian forests. *Ann. Rev. of Phytopath.* **25**, 207-229
- White P., Earnshaw M.J. and Clarkson D.T.** (1988). Effect of shoot-root ratio and temperature on K⁺ influx in rye. *Plant and Soil* **111**, 245-248.
- Williams W.E., Garbutt K. Bazzaz F.A. and Vitousek P.M.** (1986) The response of plants to elevated CO₂ IV. Two deciduous-forest tree communities. *Oecologia* (Berlin/West) **69**, 454-459.
- Willis D.H. and Peet M.M.** (1989) Predicting yield responses to different greenhouse CO₂ enrichment schemes: Cucumbers and tomatoes. *Agric. For. Meteorol.* **44** 275-293.
- Wilson C.A. and Mitchell J.F.B.** (1987) A 2x CO₂ climate sensitivity experiment with a global climate model including a simple ocean. *Final report CEC contract CL-114 UK(H)*, UK Met. Off., Bracknell.
- Wittwer S.H.** (1985). Carbon dioxide levels in the biosphere: effects on plant productivity. *CRC Critical Reviews in Plant Science* **2**, 171-198. CRC Press, Boca Raton, Florida.

- Wong S.C., Cowan I.R. and Farquhar G.D.** (1979) Stomatal conductance correlates with photosynthetic capacity. *Nature* (London) **282**, 424-426.
- Wong S.C., Cowan I.R. and Farquhar G.D.** (1985) Leaf conductance in relation to rate of CO₂ assimilation. I. Influence of nitrogen nutrition, phosphorus nutrition, photon flux density, and ambient partial pressure of CO₂ during ontogeny. *Plant Physiology* **78**, 821-825.
- Woodward F.I.** (1987) Stomatal numbers are sensitive to increases in CO₂ from pre-industrial levels. *Nature* **327**, 617-618
- Woodford J.A.T.** (1988) The impact of cropping policy on methods to control potato leafroll virus. *Aspects of Applied Biology* **17**, Pt 1, 163-171.
- Woodford J.A.T. and Gordon S.C.** (1977) The effect of cane management on raspberry cane midge. *Bulletin of the Scottish Horticultural Research Institute Association* No. **13**, 19-27.
- Young I.M.** (1987). Soil strength and hard-setting behaviour of some structurally unstable British soils. *Unpublished Ph.D. Thesis*. University of Aberdeen, Aberdeen. pp. 24
- Young I.M., Costigan P.A. and Mullins C.E.** (1988) *Physical properties of two structurally weak soils and their effects on crop growth*. Proc. 11th ISTRO Conf. Edin, **2**, 933-938.
- Young I.M.** (1989) *A drain on Fenland's top asset*. *The Independent*, 26th June, 1989, 17.
- Young L.G.** (1974) The chemical composition of the Venusian atmosphere. *Int. Astr. Un. Symp.* **65**, 77-160.

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