Book review

G. Kahnt: Ackerbau ohne Pflug. Voraussetzungen, Verfahren und Grenzen der Direktsaat (Agriculture without ploughing; premises, procedures and limits of direct drilling). 128 pp. with 48 figures and 54 tables, efalin-bound. Eugen Ulmer, Stuttgart. Price DM 32.

Direct drilling and minimum cultivation have gained importance since it was realized that regular ploughing is unnatural and in several ways harmful to soil structure and soil life. The development of the short-life herbicides Gramoxone and Reglone, some ten years ago, opened the way to direct sowing because crop residues and weeds can be disposed of without ploughing. However, as the author points out, the big change in agriculture began only about three years ago with the development of new seed drill machinery. With minimum soil cultivation it is no longer necessary to use the same amount of herbicides as before and the most economic and ecologically desirable way of management can be individually determined for each crop on each location. To-day it is not just a choice between mechanical or chemical treatment; minimum application of both is preferable from the ecological point of view and less expensive than conventional practice. The result may be that fields have a somewhat disorderly aspect but yield is not reduced.

With minimum cultivation root growth is stimulated, the activity of soil animals and microorganisms is enhanced, soil crumb structure becomes improved and soil erosion and leaching is strongly reduced, less fertilization thus being necessary, while the humus content is enriched. Weed seeds and pathogenic propagules from previous years are not raised to the surface by ploughing and can gradually die out. The antiphytopathogenic potential of the soil is said to be raised (although occurrence of foot diseases may sometimes increase), but little is yet known about further phytopathological consequences.

Agriculture without ploughing is a promising trend and will have much to do with integrated control of diseases and pests. This booklet is divided into the chapters: Why cereal growing without ploughing? (effects of cultivation, situations in which ploughing should be omitted); premises for ploughless cereal growing (technical, chemical, biological, local); ploughless cereal growing as a contribution to the maintenance of the landscape; ploughless techniques and environmental stress; and limitations. The machinery and some results are illustrated by clear photographs and numerous yield analyses are tabulated. On the basis of much personal experimentation, Kahnt presents to farm managers and particularly to the expert plant growers, a condensed critical judgement of the premises and possibilities of minimum cultivation, but does not give a simple instruction how to do it.

W. Gams

W. T. Bradnock (Ed.): Advances in research and technology of seeds – Part 1. Centre for Agricultural Publishing and Documentation (Pudoc), Wageningen, Netherlands, 84 pp., 1975, price Dfl. 25.

J. R. Thomson (Ed.): Advances in research and technology of seeds – Part 2. Centre for Agricultural Publishing and Documentation (Pudoc), Wageningen, Netherlands, 112 pp., 1976, price Dfl. 25.

These are the first two volumes of a series which is intented as a successor to the ISTA Seed Bibliography which was compiled for many years by staff of the Dutch Seed Testing Station and published in the Proc. Int. Seed Test. Assoc. As stated in the Introduction to Part 1, the series will cover studies on all aspects of seeds. The frequency of review of a particular subject will depend to some extent on the numbers of papers produced on that subject.

Part 1 contains reviews on: seed germination (22 pp. and 81 refs.), tree and shrub seed (8 pp. and 34 refs.), seed dormancy (8 pp. and 42 refs.), seed pathology ($14^1/_2$ pp. and 112 refs.) and seed vigour (7 pp. and 24 refs.), covering mainly the years 1970–1972.

Part 2 contains reviews on: seed dormancy (10 pp. and 130 refs.), seed pathology (22 pp. and 257 refs.), seed vigour (18 pp. and 118 refs.) and seeds in relation to ecology (15 pp. and 104 refs.), covering mainly the years 1972–1974.

Three of the five subjects of Part 1 recur in Part 2 (two of them by the same reviewer). The number of references cited in Part 2 is considerably larger than that in Part 1 on the same topic.

The reviews on seed pathology in both parts are by P. Neergaard. He discusses: 1. seed-borne

fungi, 2. storage fungi, 3. techniques for detection of seed-borne fungi, 4. seed-borne bacteria, 5. seed-borne viruses, 6. seed-borne nematodes, 7. annual and regional reports on seed health testing, 8. policy of seed-health testing, 9. studies on seed treatment (topics 3, 7 and 8 were added in part 2). In these the pathogens are listed in alphabetical order, followed by the hosts in the same manner. The other reviews are simularly divided by topics.

The series offers an opportunity for a quick orientation about recent developments and serves as a guide to recent literature. The reviews are brief and consist mainly of an orderly arrangement of abstracts relevant to the particular heading of articles that appeared during a period of two to three years. The value of the series would probably be enhanced if all aspects of seed science were to be treated regularly every one or two years. T. Limonard

L. C. Davidse: The antimitotic properties of the benzimidazole fungicide carbendazim and a mechanism of resistance to this compound in *Aspergillus nidulans*. Thesis, Agricultural University, Wageningen, 84 pp., 1976.

This thesis consists of four articles that appeared from 1973 onward, together with an introduction and a general discussion and summary. It presents the results of three years of research on the mechanism of action of the benzimidazole group of systemic fungicides of which carbendazim or methylbenzimidazol-2-yl-carbamate (MBC) is the active intermediary compound.

The author has shown that the action of these fungicides is based on their antimitotic properties. MBC is bound to the tubulin proteins which are part of the spindle fibre material. It is well known that resistance to benomyl and related fungicides arose very soon after their application on a larger scale. Davidse's studies on resistant mutants of *Aspergillus nidulans* have demonstrated that the mechanism involved is related to the capacity of tubulin to bind carbendazim. Mutants with a decreased tubulin affinity for MBC were less sensitive. Metabolic conversion of MBC was found to occur in *A. nidulans* strains, but had no relation to resistance.

The elucidation of the mechanisms of fungicidal action and of resistance to MBC as described in this dissertation is an important contribution to science. T. Limonard

Consulentschap voor Planteziekten- en Onkruidbestrijding in de Tuinbouw: Gids voor ziekten- en onkruidbestrijding; akkerbouw, tuinbouw, openbaar groen (Guide to disease and weed control; arable farming, horticulture, public parks). Ministerie van Landbouw en Visserij, Consulentschappen voor Planteziektenbestrijding, Wageningen: 6th ed. 1977. 416 pp. including 5 pp. of crops index; paper back; Price Dfl. 25 (foreign countries Dfl. 35).

The present book, entirely in Dutch, is the sixth edition of the important guide to disease, pest and weed control published biannually. It contains addresses of organizations and officials involved in crop protection in the Netherlands (9 pp.) and information on legal aspects concerning plant diseases and pests, pesticide use and chemical control in general (32 pp.). Concise technical information on agricultural chemicals, including pesticides and growth regulators, is arranged first according to aim of application (fungicides, insecticides, rodenticides etc.) and then alphabetically by chemical with data on active substance and application (81 pp.).

The most extensive part of the book deals with disease and pest control in arable crops, grassland, fruit crops, vegetable crops, ornamentals and public parks (224 pp.). Within these groups the crops are listed alphabetically, as are the various diseases and pests as well as non-pathogenic disorders per crop. The Dutch names of diseases and pests are followed by the scientific names of the pertinent organisms. The damage or symptoms caused are briefly described, and information is summarized on methods of control, including concentrations of chemicals required. The last section concerns weed control, with technical information on the herbicides (28 pp.) and their application in various crops (30 pp.).

The book is biannually revised and again brought up to date. It is the product of efficient collaboration between research and extension in the Netherlands. Great care has been given to proper naming, for example of diseases and pests and to reliable scientific naming of the pathogenic and parasitic organisms. The publication contains much valuable information for growers, extension officers, students and teachers of crop protection courses who can read Dutch. L. Bos