

Book reviews

H. Maier-Bode: *Herbizide und ihre Rückstände*. Verlag Eugen Ulmer, Stuttgart, 1971; 479 pages, 189 tables and 41 text figures, 1470 references to literature; DM 80.

In the preface the author states that chemical weed control is so widely applied nowadays that herbicides and their residues may become dangerous for other plants, animals and man. The scattered data from the literature on residues of herbicides in plants and toxicity to plants, animals and man have been brought together. This book can be considered to be a continuation of that written by the same author in 1965 ('Pflanzenschutzmittel-Rückstände') which dealt with insecticides only.

In an introductory chapter the economical importance of herbicides is pointed out; e.g. since 1962 among all produced plant protection chemicals the monetary value of the herbicides is on the second place in the USA and on the first place in Great Britain, from all applied plant protection chemicals in Germany 45% were herbicides in the period 1964-1966.

The directions by law for application and allowed tolerances in the following countries are reviewed: West Germany, East Germany, Switzerland, the Netherlands, Belgium, Yugoslavia, USA, Brasil, and Australia.

In the special part the 66 organic herbicides, which are most important for practical usage, are selected; the inorganic herbicides are not discussed. The chemicals are divided into 10 classes, from each the important representatives are described.

The classes are: fatty acids and derivatives (6 herbicides discussed), phenoxy fatty acids and derivatives (7), phenyl and heterocyclic carboxylic acids and derivatives (6), carbamate derivatives (4), thiocarbamate derivatives (2), urea derivatives (15), diazines (5), triazol and triazines (11), bipyridylium compounds (3), and the group of nitrophenols, nitroanilines, and derivatives (7). For each herbicide the chemical structure is given, followed by a discussion of: the physical and chemical properties (among which the stability and possible degradation under different conditions), application, action on plants (with possible metabolism in plants), side effects, toxicity for mammals and man (with possible metabolism), allowed tolerances, residues under conditions of practical application, and results of residue analysis. Degradation path-ways, toxicity of the herbicides, and residues in many plants under varying conditions are often discussed at length and illustrated with structure formulae and tables.

It looks somewhat strange that the name 'Deiquat' is used, while in a footnote it is remarked that the by the International Organization for Standardization accepted common name is 'diquat'. The reason perhaps is that the book is primarily written for the German situation, although directions by law of many other countries are presented and illustrated in tables.

At the end of the book some tables are given, e.g. on toxicology and tolerances. Further study is facilitated by an extensive list of about 1470 references, from which 189 are from 1968, 96 from 1969, and 15 from 1970. There is an elaborate subject index.

The text is carefully printed and there are very few printing errors.

The concise information about so many systematically ordered details about so many herbicides is useful for everyone working with these chemicals, especially for those concerned with toxicology, plant protection services, environment care, and with practical application.

J. J. S. van Rensen

W. Koch: *Unkrautbekämpfung*. Verlag Eugen Ulmer, Stuttgart, 1971; 342 pages, 32 tables, 42 text figures and photographs; DM 34.

This book, dedicated to Prof. Rademacher, gives a valuable survey of methods of weed control. The elaborate first chapter on the biology and ecology of the weed plant is followed by a discussion of methods of weed control: prevention of infestation, crop rotation, mechanical techniques, and biological and chemical ways.

After an elementary exposition of the chemistry of organic herbicides the mode of action and behaviour of these chemicals on and in plants is briefly described; some more details are given on the behaviour in the soil and side effects of herbicides. The herbicides are divided into 12 classes; from

each the most important compounds are mentioned with structure formulae, chemical and physical properties, mode of action and behaviour in plant and soil, and application.

Methods of weed control in many agricultural and horticultural crops, in meadows and forests, are discussed in detail; in this discussion most attention is given to chemical control. Also total weed control and aquatic weed control is dealt with. In a closing outlook the author points to some aspects of future research and stresses the necessity of international co-operation in the field of herbology.

In this book the weed plant is put in front, followed by its reaction on control measures, especially in crops. So the book is of importance for ecologists and all research workers, teachers, and growers, concerned with weed control.

J. J. S. van Rensen

C. Buhl and F. Schütte: *Prognose wichtiger Pflanzenschädlinge in der Landwirtschaft*. Paul Parey, Berlin and Hamburg, 1971, pp. 364, 227 fig.; price DM 39.80

Limitation on the use of pesticides is one of the main objectives of present-day economic entomology. For this purpose population sampling and the establishment of the pest-population level in commercial crops is urgently needed. Index methods that are rapid and simple to use are required. The book by Buhl and Schütte attempts to present such methods and to provide critical population levels at which chemical control becomes necessary in a number of crops like cereals, beets, potatoes, rape, peas, beans and cabbage.

The book consists of two parts. In about 40 pages information is given on methods for the population estimation and in the second part, over 300 pages, the pests are discussed. Topics like identification, host plants, type of damage control methods, prognosis, and economic injury levels are dealt with.

No doubt the threshold values proposed by the authors will need further verification and adaptation to the conditions in other countries, but in this book we do find a starting point for our efforts to spray as little as we dare.

I hope this book will be frequently consulted by plant protection advisors and I join the authors in their request for critical remarks.

G. W. Ankersmit

M. B. Ellis: *Dematiaceous Hyphomycetes*. Commonwealth Mycological Institute, Kew, Surrey, England, 1971, pp. 608; price £ 6.

This is the first time, that genera and species of dematiaceous imperfect fungi have been described, beautifully illustrated, and keyed out in one volume by one of the leading experts. Most of the work presented in this volume is based on Ellis' personal investigations mainly from natural substrate (mostly disregarding characters of pure cultures). The term dematiaceous Hyphomycetes is conceived in the widest possible sense, including also genera with hyaline hyphae and only partly pigmented conidia, e.g. *Botrytis*, *Aspergillus*, *Scopulariopsis*, and *Verticillium*. For conidium ontogeny the terminology coined at the Kananaskis symposium (W. B. Kendrick: *Taxonomy of Fungi Imperfecti*, in press) is used throughout. The unprepared user might encounter difficulties in understanding this scheme from the very condensed introduction. In some genera the recognized species are keyed out; for other genera references to detailed studies are given.

Phytopathologists will find good accounts for the following genera: *Thielaviopsis* (2 species with key), *Spilocaea* (2), *Fusicladium* (1), *Stemphylium* (5 species with key), *Botrytis* (18 species listed with host plants and conidial measurements), *Pyricularia* (2), *Cladosporium* (preliminary key to 15 species), *Graphium* (only 3 species having annellophores; where do the conidial states of *Ceratocystis* belong?), *Helminthosporium* (10 species with key), *Drechslera* incl. *Bipolaris* (47 species with key, all of them illustrated, with host list), *Curvularia* (31 species with key), *Alternaria* (27 species described and illustrated in a morphological sequence, with host list), *Verticillium* (only 2 saprophytic dematiaceous species), *Myrothecium* (11 species with key).

The user must be warned, that complete coverage of described species is not intended in any genus. Lists of synonyms, more species and keys, discussions on generic delimitations and quotation of material examined would easily have doubled the size of the volume. The concise text is very carefully produced. A substrate index further facilitates identification.

W. Gams

D. S. Meredith: Banana leaf spot disease (Sigatoka) caused by *Mycosphaerella musicola* Leach. Phytopathological Papers No 11; Commonwealth Mycological Institute, Kew, Surrey, England, April 1970, pp. 147, 33 fig, 1 map, 19 tables and 355 ref.; price £ 2.25

'Phytopathological Papers' are published at irregular intervals by the CMI and deal with various plant pathological subjects. No 11 presents a monograph on the most serious leaf spot disease ('Sigatoka') in banana, caused by the ascomycetous fungus *Mucosphaerella musicola* Leach (imperfect state: *Cercospora musarum* Zimm.). The disease was first reported in 1902 in Java and discovered ten years later in the Sigatoka district of the island of Viti Levu, Fiji. At present it is known to occur in most banana-growing countries of the world, but not in Egypt, Israel and the Canary Islands.

The paper includes all the important references available up to August 1969. In the first three chapters details are given on the history and distribution of the disease; the morphology, taxonomy, nomenclature and sexuality of *M. musicola*; the economic importance, nature, effects and assessment of the disease. The next eight chapters deal with infection biology, spore germination, penetration, symptom development, and factors affecting the disease; spore production in the field; spore release, dispersal, deposition and longevity; varietal susceptibility; epidemiology; and control. Each chapter ends with a summary. In a separate chapter an account is given of investigations on the 'new' banana leaf spot disease ('black leaf streak') in the Pacific, which is similar to 'Sigatoka'. In the final discussion various suggestions are given for future study on the possibility of arriving at successful and at the same time economical control of the disease.

The paper is an example of an excellent monograph on a specific disease.

G. H. Boerema

P. Holliday: South American leaf blight (*Microcyclus ulei*) of *Hevea brasiliensis*. Phytopathological Papers No 12; Commonwealth Mycological Institute, Kew, Surrey, England, April 1970, pp. 31, 8 fig., 1 map, 4 tables and 138 ref., price £ 0.60.

This 'Phytopathological Paper' gives a comprehensive account of the serious leaf disease in rubber caused by the ascomycete *Microcyclus ulei* (P. Henn.) v. Arx (commonly known as *Dothidella ulei* P. Henn.; conidial states: *Aposphaeria ulei* P. Henn. and *Fusicladium macrosporum* Kuyper). So far this disease occurs only in the South American tropics but not in Southeast Asia, the leading area in natural rubber production.

Aside from a review of earlier work the paper contains data from researches at the University of the West Indies, Trinidad (Unit of the Rubber Research Institute of Malaya). The disease is discussed under: identity and morphology of the fungus; economic significance; distribution; spread and host range; symptoms; life history; culture in vitro; epidemiology; climate and control, including a discussion on the possibility of its spreading to Southeast Asia.

A review of this kind is valuable as a guide-line for the study of many other 'threatening' plant diseases. It should greatly facilitate the task of Plant Protection Organizations and Services.

G. H. Boerema

G. J. Turner: Fungi and plant disease in Sarawak. Phytopathological Papers No 13; Commonwealth Mycological Institute, Kew, Surrey, England, January 1971, pp. 55, 3 maps, 4 tables, price £ 0.80

Most phytopathological research starts with a check list. Turner's list of fungi and plant diseases in Sarawak is mainly restricted to pathogenic fungi associated with agricultural crops. The majority of the fungi listed were collected by the writer between 1960 and 1969 and had been recorded earlier in 'Garden's Bulletin, Singapore'. It is a pity that fungi and diseases occurring in the great forested regions of Sarawak are not included. The general introduction to the topography, drainage and communication, climate, soils, vegetation, population and agriculture of the area are well worth reading.

G. H. Boerema

J. C. Walker: *Fusarium* wilt of tomato. Monograph No 6. The American Phytopathological Society, St Paul, Minnesota, USA, 1971, pp. 56, 16 fig., 449 ref.; price \$ 3.

In this monographic study on vascular wilt of tomato, incited by *Fusarium oxysporum* Schl. f. sp. *lycopersici* (Sacc.) Snyder & Hansen, the author gives an ample and clear survey of early records of the disease, symptoms, synonymy and morphology of the pathogen, environmental relations, inheritance

of resistance, development of resistant varieties, host nutrition in relation to disease development, seed transmission, predisposition to disease, pathogen physiology, host-parasite interactions, nature of host resistance, and control by other means than breeding.

Much emphasis has been given to breeding for resistance. 'Because of its importance in the principal tomato-growing areas of the world, efforts to develop resistant varieties have continued since 1910. The success of the breeding program has been complicated by the appearance of race 2 in 1960, but varieties resistant to it have been developed. This disease probably provides the outstanding example of control of a plant disease by resistance. Seed transmission, undoubtedly important in the early spread of the pathogen, is still significant for the spread of new races'.

The compilation of so many data on *Fusarium* wilt may be of great help in clarifying the conflicting ideas which still exist about wilting mechanisms and internal vascular browning in general. In fact a very detailed differentiation has been made between toxic effects on transpiration and plant growth by lycoramin, fusaric acid, ethylene and 3-indoleacetic acid on the one hand and influences on the viscosity of the tracheal fluid, translocation of water, xylem plugging by pectolytic and cellulolytic enzymes and browning by polyphenoloxidase on the other hand, respectively. However, Walker states that 'While toxins and enzymes have both received much study, their exact relations to the disease syndrome are still far from settled.'

The author also paid attention to the nature of host resistance in relation to antibiotic effects of non-pathogens, to resistance induced by non-pathogenic formae speciales of *Fusarium oxysporum* by chemicals and to breakdown of monogenic resistance by nematodes, respectively.

It is a pity that the work of Cirulli and Alexander (1966) on the inheritance of resistance to race 1 and race 2 of the pathogen has not been mentioned. But this omission is to some extent compensated by an extensive description of the development of varieties resistant to these races of the fungus.

It can be concluded that Walker's monograph on *Fusarium* wilt of tomato is almost indispensable to all those interested in vascular wilt diseases of any plants.

N. Hubbeling

R. W. Rayner: A mycological colour chart. Commonwealth Mycological Institute, Kew, Surrey, G. B., 1970, 34 pp. with 17 sheets. Price £ 2.

The colour terminology still most frequently used in mycology is based on Ridgway's colour standards (1912) containing 1115 colour chips which were all given an individual name. Only very few copies of this precious book are still available; after long usage the colours often differ in shade between different copies; therefore this book should no longer be used as a standard reference. A more sophisticated and reproducible system is Munsell's book of color, published for the first time in 1905 and in several modern editions; colours are denoted with figures and letters according to hue, value and chroma; they are arranged in a three-dimensional diagram. Besides these best known systems various colour codes have been published since. None of them was universally recognized by biologists. In addition some translating tables have served to make codified colour designations understandable.

The most modern tables combined with colour charts are presented here. Rayner's mycological colour chart contains 34 pages of text and two sets of single sheets. A condensed introduction covers five pages. Three tables list:

1. English names, corresponding numbers, American standard names, and Munsell's symbols;
2. Latin names with English equivalents;
3. Ridgway's names, Rayner's symbols, and Munsell's symbols.

Chart I consists of 9 sheets with 128 colour chips arranged:

1. In five series from ungreyed to five-times greyed;
2. In columns according to the spectrum, numbered from 1 to 71;
3. In 7 rows with increasing value, marked with letters. Each series is subdivided by coordinates into small squares corresponding roughly to Ridgway's scheme. Several of these squares are combined by heavy lines, so that they correspond to one adopted colour name. The present selection of names reflects an English tradition of colour terminology and allows all names to be translated into Latin according to Saccardo's Chromotaxia. Where a colour name is represented in different series or columns, arrows indicate the place where the colour chip can be found. By extrapolation and combination of names it is possible to characterize some 400 hues with great accuracy. This is sufficient for diagnostic purposes. It is however not always possible to trace back all Ridgway's names in the present scheme, as is evident from table 3. Chart 2 consists of 8 sheets with diagrams representing cross sec-

tions of the Munsell colour solid. It facilitates finding names for Munsell's symbols. If required a separate set of colour chips can be purchased and mounted on the points indicated in this diagram.

The present colour chart can prove its value only when it is universally used. It fills a long felt gap and fulfills the aim of giving reliable names and, if required, colour symbols for diagnostic purposes. It is recommended, that from now on this colour chart should be used for all mycological and possibly other biological descriptions.

W. Gams

J. Smolák, E. Haspel-Horvatič and O. Majerník (Ed.). 1970: Pathological wilt of Plants. Proceedings of an international symposium at Nitra, Czechoslovakia, 1-6 September 1966. 127 pp., bound.

This booklet contains the text of an opening lecture, 9 papers by Czechoslovakian authors and 6 papers by authors from Italy, Russia, Germany and Rumania. Most papers are in English with a German summary and only a few in German with an English summary, one paper is written in Russian and is followed by an English and a German summary. The contents are classified under three different heads, which are, in contrast to the English title of the book, in German.

1. Die Pflanze als Objekt im Prozess der pathologischen Welke (the plant as object in the process of pathological wilting).
2. Gründe der pathologischen Pflanzenwelke (origin of pathological wilting of plants).
3. Der Pathogen und seine Spezialisierung bei der pathologischen Pflanzenwelke (the pathogen and its specialization in the pathological wilting of plants).

This subdivision seems somewhat arbitrary. Several papers do not deal with pathological wilt *sensu stricto*, but concern rusts, necrosis etc., which makes the contents rather heterogeneous. The proceedings appear 4 years after the conference; this certainly is a drawback for a publication in a field with such rapid developments.

Although the English text does not always read smoothly, it is quite understandable and the number of printing errors is limited. In a 'conclusion' the hope is expressed that this conference will be the first in a series of similar meetings in the physiology of parasitism and related problems.

J. Dekker

Publications received

The publications marked with an asterisk will be reviewed in due time

*C. Booth: The genus *Fusarium*. Commonw. Mycol. Inst., Kew, Surrey, England. 1971. pp. 237, 70 fig. Price £ 3.00 (\$ 7.80).

G. W. Hurst & R. P. Rumney: Protection of plants against adverse weather. World Meteorological Organization, technical note no. 118 (WMO-No 281), Geneva, Switzerland, 1971. pp. 64, 28 fig., 11 tables.

*C.-M. Messiaen & R. Lafon: Les maladies des plantes maraîchères. 2nd edition. Institut National de la Recherche Agronomique, 149, rue de Grenelle, 75-Paris-7e. Price F 64.50.

P. D. Turner: Micro-organisms associated with oil palm (*Elaeis guineensis* Jacq.). Commonw. Mycol. Inst., Kew, Surrey, England. 1971. pp. 58, Price £ 1.00.

*VIII^e Symposium européen sur les maladies à virus des arbres fruitiers. 1971. Annales de Phytopathologie (supp. 3), pp. 560. Price F 65.

Bibliography of potato diseases through 1945; with common and scientific names. 1970. Miscellaneous Publication no. 1162. Agricultural Research Service, U.S. Department of Agriculture, Washington, D.C. For sale by the superintendent of documents, U.S. Government Printing Office, Washington, D.C. 20402. pp. 243. Price \$ 1.25.

Meteorological factors affecting the epidemiology of wheat rusts. Report of the working group on meteorological factors affecting the epidemiology of wheat rusts of the Commission for Agricultural Meteorology. 1969. Prepared by W. H. Hogg, C. E. Hounam, A. K. Mallik & J. C. Zadoks. World Meteorological Organization, technical note no. 99 (WMO-No 238. TP. 130), Geneva, Switzerland. pp. 143, 24 fig., 15 tables.

*Ziekten en afwijkingen bij bolgewassen. Deel 1: Liliaceae. 1971. Laboratorium voor Bloembollenonderzoek, Lisse, The Netherlands. pp. 129, 200 fig. Price Dfl. 11.25.