Book reviews

Peachey, J. E. (Ed.): Nematodes of tropical crops. Commonwealth Agricultural Bureaux, Farnham Royal, Bucks, England, 1969. 355 pp. Price £ 4.00 ($ 10.40).

This book is edited from papers presented at the Caribbean Symposium on Nematodes of Tropical Crops (1968), and contains 31 contributions.

There are chapters of general interest (methods, identification, distribution, proofs of pathogenicity), followed by various contributions about specific nematode problems. Some of these are on the nematodes of a particular region, others on problems of important tropical crops. The book ends with chapters on control, the role of extension in nematology, the training of plant nematologists, and sources of information in plant nematology. The book itself certainly is a useful source of information.

There is no index. Also, in view of the significance of the book for all tropical countries, it is regrettable that no summaries are included in spanish and french. This is rather surprising in view of the editor's own recommendation on page 349: 'ideally an original paper should include both the title and the summary translated into one or more languages'.

H. Hoestra

Nienhaus, F.: Phytopathologisches Praktikum. Paul Parey, Berlin und Hamburg, 1969. 167 pp, 61 figures, bound. Price DM 26.–.

This book contains 114 exercises in phytopathology, concerning diagnostics (8), fungal and bacterial diseases (59), virus diseases (20), nematodes (11) and weeds (6). It is primarily meant for university teachers, in charge of practical courses in phytopathology. The large number of experiments makes a choice possible. The instructions are kept short, but there is ample reference to the literature. The text is moreover illustrated with a number of clear figures. An explanation of phytopathological terms and a description of various nutrient media and laboratory techniques has been added.

I expect this book will serve its purpose well.

J. Dekker

Horsfall, J. G. & Baker, K. F., (Ed.): Annual review of phytopathology. Vol. 8. Annual Reviews Inc., Palo Alto (Calif.) USA, 1970. 480 pp. Price $ 10.50.

The prefatory chapter to the eighth volume of this series has been written by the reknown virologist F. C. Bawden under the head: musings of an erstwhile plant pathologist. One paper deals with the history of plant pathology in Australia. The other articles concern morphological, physiological, genetic and epidemiological aspects of plant diseases caused by fungi, bacteria, viruses; the biology and taxonomy of dwarf mistletoes, the mechanism of action of antifungal antibiotics and plant chemotherapy with natural products. I want to mention especially an interesting historical article by M. Klinkowski on catastrophic plant diseases, and a review of phytopathological organizations of the world by L. Chiarappa (FAO). In this review the Netherlands Society of Plant Pathology is mentioned as the oldest national phytopathological society of the world, established in 1891, followed by the American Phytopathological Society in 1908 and the Phytopathological Society of Japan in 1916, while other societies were only established after 1930. In 1895 the Netherlands Journal of Plant Pathology started as the first phytopathological periodical, followed by Phytopathology (USA) in 1910 and the Annals of the Phytopathological Society of Japan in 1918.

The contents of this volume are again of high quality and contain information of interest to the specialist as well as to those who have a more general interest in plant pathology. A list of reviews published elsewhere and of interest to the plant pathologist, has been added.

J. Dekker

Matthews, R. E. F.: Plant virology. Academic Press, New York and London, 1970. XV + 778 pp. Price $ 29.50.

During the last two decades plant virology has developed from a small part of plant pathology to a wide field of research.

We ought to be very thankful to Professor Matthews for taking up the almost impossible task of writing an up-to-date account of all aspects of plant virology.

The book starts with a brief historical review of the development of plant virology, followed by chapters on assay and isolation of viruses, structural components and architecture, methods of transmission and infection, replication and movement. In another chapter attention is paid to defective particles, multiparticle and satellite viruses. Following chapters deal with disease symptoms, agents inducing symptoms like those caused by viruses, as well as effects on plant metabolism, and factors influencing the course of infection and disease. Variability, inactivation and serological reactions of viruses are also discussed. Some 50 other pages are devoted to relationships between plant viruses and invertebrates. The subjects ecology, economic importance and control are separately considered and in the last chapter problems of nomenclature, classification, and speculation on origins are discussed.

Professor Matthews succeeded admirably in covering the whole field of plant virilogy. The literature reviewed is selective, with apparent concentration on important early papers and on the most important recent ones.

In the appendix of literature on plant virology the author mentions the Netherlands Journal of Plant Pathology among the eight most important research journals regularly containing original papers relevant to plant virology.

The book contains many tables and is illustrated with 194 photographs, drawings and diagrams. The abundant illustrations of high quality and the style used make the book very readable. It has been written for graduate students, teachers and research workers. Although the price may be a limitation for the first group, this excellent book will be extremely useful for every plant virologist and it certainly belongs in every library dealing with phytopathology.

D. H. Wieringa-Brants

Arx, J. A. von: The genera of fungi sporulating in pure culture. J. Cramer, Lehre, 1970. 288 pages, 136 text-figures illustrating more than 300 fungi, 28 pages references. Price DM. 60.–.

The fundamentals of this attractive paper-bound book are the dichotomous generic keys to fungi that can be grown in culture, originally published in a German edition ('Pilzkunde', edited by J. Cramer, 1967). The identification of fungi in vitro resulting from the author's and his co-workers' years of experience has been excellently laid down in these keys. As far as fungi sporulating in culture are concerned the present elaborated English version of the keys also gives a good view of the genera – the accepted genera – that can actually be differentiated, this in contrast with the numerous unsupported genera described in literature: 727 genera are recognized; 469 genus-names are inserted as synonyms! A valuable addition to the first German version is the references to the original descriptions and monographs or other studies of the accepted genera. This allows to check a genus determination and facilitates further identification at species level.

The first chapter outlines modern opinion on the natural phylogenetic classification of the fungi. It is shown that the fungi sensu lato are partially classified with the kingdom Protista whereas the majority form the kingdom Mycota. In view of practical objections to such a 'mycological fission' the author follows his arrangement discussed earlier in 'Pilzkunde'. This comprises a polyphyletic kingdom Mycota, divided in four phyla: Myxomycota (e.g. Myxomycetes, Plasmodiophoromycetes), Oomycota (e.g. Oomycetes), Chytridiomycota (Chytridiomycetes) and Eu-Mycota (Zygomycetes, yeasts, Ascomycetes, Basidiomycetes, Deuteromycetes). In the second chapter a short review is given of the various possibilities of sporogenesis and spore types occurring within the fungi. There are valuable notes on intermediate stages and the taxonomical usefulness of the various phenomena distinguished.

The first key covers all the orders of the fungi. In the succeeding chapters the orders of the fungi that can be identified in vitro are treated in sequence, with exclusion of the Acrasiales and the Labyrinthulales of the Myxomycota, the Tuberales, the Erysiphales, most 'Discomycetes', the Laboulbeniales of the Ascomycetes and all the orders of the Basidiomycetes. Of many genera a characteristic species has been illustrated by clear line drawings, from mostly new originals. Two new genera are described in the book, 1 new species and 18 new combinations are introduced. The bibliography comprises 740 publications. The book ends with an index of all genera treated, with synonymous names in italics. Addition of an index of the numerous species names cited would have been very useful.

I have not searched for errors and other imperfections. In view of the numerous citations of names and references, undoubtedly there are some, but that cannot alter the value of this – in my opinion – unique identification book. In view of my personal experience with the German version of the keys published earlier I can say that especially the keys on the Deuteromycete genera (114 pages) are easy to use and excellently constructed. By the addition of references to monographs and other studies of the genera treated this English version also provides a key to species-identification.

For phytopathologists working with fungi this identification book will prove to be of great practical value. In the field of mycology it is not only a work of identification but also an important contribution to clarification of the still chaotic taxonomy of 'microfungi', especially the Deuteromycetes.

G. H. Boerema

Booth, C.: The genus Fusarium. Commonwealth Mycological Institute, Kew, Surrey, England, 1971. 237 pp., 50 figures, 20 photographs. Price £ 3.00.

In the classification of *Fusarium* two opinions still exist: the followers of Wollenweber's system recognize a large number of species while those following Snyder and Hansen recognize only nine species and various 'cultivars'. Until recently, species identification in both systems was difficult because the classical monograph by Wollenweber and Reinking (1935) is difficult to use, giving too little information about characters of pure cultures.

The Snyder and Hansen system was still based on Wollenweber's monograph; it has recently become more accessible since the publication of the 'Pictorial guide to the identification of *Fusarium* species' (Toussoun and Nelson, Pennsylvania State University Press, 1968) with its beautiful photomicrographs, and the French treatise by Messiaen and Cassini (Annls Epiphyt. 19:387–454, 1968). Although still widely used, the species concept of this system is too inaccurate and the nomenclature used is not in accord with the rules of the International Code.

The Wollenweber system comprised in 1935 of 142 species, varieties and forms. Taking into account a great variability between numerous isolates of a species, Gordon (1952 and later) significantly reduced this number. His modified scheme is now also in use in Berlin (Gerlach in Annls Acad. Sci. fenn. A, IV Biologica 168:37–49, 1970, recognizing 65 species) and in numerous other places. It culminates in the present handbook by Booth with 51 recognized species and varieties.

This book opens with a short historical introduction followed by chapters on morphology, methods of study, preservation and nomenclature. In species concepts and in the list of synonyms few changes have occurred since Wollenweber and Gordon. The greatest changes have taken place in the arrangement of sections and in the keys. Since in hyphomycete taxonomy much emphasis is now laid on conidium ontogeny, an important conidiophore character has been recognized in the presence of polyphialides in some species. This led to a splitting of the former section *Sporodochiella* and its partial combination with the section *Arthrosporiella* together with *F. avenaceum* from the former section *Roseum*. *F. concolor* from the former section *Arthrosporiella* now stands in section *Gibbosum*. The descriptions of the species contain a full account of pure culture characters which were obtained mainly from cultures growing on potato sucrose agar. Less emphasis is placed on conidial measurements. Conidia and conidiophores of each species are illustrated by line drawings c. 1000:1 (and partly by less spectacular photographs).

Experts may argue about the justification of the above-mentioned rearrangement of sections. To say the least, it is inconsistent, that the presence of polyphialides is, in one case, used to split the former section *Sporotrichiella* and, in the other, serves only to distinguish a variety from *F. moniliforme*. Harder to justify is the combination of the perfect states of the *Arachnites Fusaria* into one genus *Micronectriella*: the perithecia of *Griphosphaeria (Calonectria) nivalis* mature within the host tissue and its asci are amyloid, whereas in *Plectosphaerella cucumeris* the perithecia are superficial and the asci are not amyloid.

The identification of *Fusarium* species always had the reputation of being difficult and requiring the experienced knowledge of an expert. This is mainly due to the great variability of species and often insufficient development of important characters in a culture deviating from an ideal 'Hochkultur'. Nevertheless, in comparison with other genera such as *Penicillium*, the distinction of the limited number of species in *Fusarium* is relatively easy. It is possible to recognize e.g. *F. solani* without presence of microconidia, and to distinguish *F. oxysporum* from *F. moniliforme* without presence of macroconidia and chlamydospores (at least with a high degree of certainty so that further cultural

techniques can be applied for confirmation). A good deal of such experience could be presented in didactic keys by offering a whole range of characters in one alternative and by multiple ways leading to one species. The identification would then require slightly more time and become much more reliable. The general use of only one pair of characters in the present keys is dangerous. It will often lead beginners to misidentifications.

As the most advanced guide to species identification in *Fusarium* the book will be welcomed by and become indispensable to phytopathologists.

W. Gams

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

The last extensive publication on the diseases of bulbs was W. C. Moore's excellent handbook of 1939. After a lapse of more than 30 years the present volume is a very welcome addition presenting the new and old information in a nutshell.

In this publication emphasis is laid on symptomatology as appears from the 200 black and white photographs thus greatly helping recognition of the diseases in the field. Other aspects of the diseases, such as the cause, occurrence, spread and control are mentioned briefly.

The authors expect this book to be a useful guide for teaching in horticulture, for extension- and inspection services and for the growers.

The present volume only concerns Liliaceae. Part 2 will deal with Iridaceae, Amaryllidaceae and some other plant families.

An English edition will be provided for by Pudoc, Wageningen, the Netherlands.

J. Dijkstra

Kiraly, Z., Klement, Z., Solymosy, F. & Vörös, J.: Methods in plant pathology. Akadémiai Kiadó, Budapest, 1970. 509 pp. Dfl. 133.—.

This book is meant for research workers and students in plant pathology, interested in basic methods in plant virology (see second part of review), mycology, bacteriology and in plant pathological aspects of breeding for disease resistance. It is, however, not a mere description of techniques and methods, but gives also a general treatment of the various types of plant pathogens and diseases. In the parts on mycology and bacteriology, for example, there are not only chapters on methods (isolation, maintenance, microscopic investigation, preparation of culture media etc.) but attention is also paid to the general characters of fungi and bacteria, such as sexual and asexual reproduction and classification. In the part on typical fungal diseases some selected diseases, caused by fungi belonging to the various classes of fungi, are discussed, and in the part on bacteriology a few symptomatologically different diseases have been selected. Attention is paid to the life cycle of the pathogen, the occurrence of fysiologic races and various methods of studying the diseases in the laboratory as well as in the field. In the part on breeding for disease resistance the accent is on the principles involved and on the nature of various types of resistance.

Some readers may miss various types of diseases, such as cankers, post-harvest diseases or diseases caused by streptomycetes; but apparently it has not been the purpose of the authors to cover complete the field of plant pathology. There are only a few, minor mistakes. It does not seem to be correct, for example, that lomasomes occur exclusively in fungus cells (p. 261).

The text is illustrated with many, mostly original figures. In my opinion, the authors have succeeded very well in giving a useful description of the more important basic methods and techniques in plant pathology against a background of fundamental information. The book will be of great use to those engaged in phytopathological research.

J. Dekker

In this book, F. Solymosy has written the part on virology (113 pp) excluding the bacteriophages, covered separately under bacteriology. It deals with the morphology and structure of plant viruses, the relation between structure and infectivity of plant viruses, virus transmission, the events taking place after plant viruses have entered their hosts, genetics of plant virus, taxonomy of plant viruses, and control measures against plant virus diseases. In an appendix some representative plant virus diseases are described.

Before the different methods are dealt with, the theoretical background of the subject is given.

The text reads easily. As this book is also meant for those without a special training in plant virology more figures should have been included. This especially concerns the chapter on symptomatology where the symptom descriptions are rather concise.

It is unfortunate that the discovery of mycoplasma-like bodies in plants affected with yellows-type diseases is not mentioned. The author is still talking about aster yellows virus and stolbur virus (p. 57).

The book can certainly be recommended to plant pathologists, plant breeders and students who want to become acquainted with the basic methods in virology.

J. Dijkstra

VIII Symposium européen sur les maladies à virus des arbres fruitiers (Eighth European symposium on fruit tree virus diseases). Bordeaux 24–30 juin 1970. Annls. Phytopath. Numéro hors série 1971: 559 pp.; stitched. Price F 65,—.

In these voluminous proceedings, published anonymously by the French national agricultural research institute (INRA), the papers are given presented at the 8th European symposium on fruit tree virus diseases, held at Bordeaux (France), June 1970.

The first meeting of the European Committee for Co-operation in Fruit Tree Virology was held at Wädenswil, Switzerland in 1954. The second was organized at Wageningen, the Netherlands and was the first real symposium with 40 participants and thirteen papers. The present proceedings list 124 participants (from 23 countries, partly outside Europe) and contain 58 contributions. The latter figures clearly indicate how fruit tree virology has rapidly expanded in the last 16 years.

Because of their wide diversity it is impossible to record and discuss the subjects dealt with during the 14 sessions. In the inaugural one a paper was given by Dr P. Cornuet on some aspects of present day virology. The other papers have been grouped into 12 sessions on description of virus diseases, identification of viruses, sharka, pear viruses, chlorotic leaf spot and latent (apple) viruses, mycoplasma, interaction between viruses, selection and diagnosis, epidemiology, and sanitary control. A high percentage of the papers (13 in total) concerned sharka of *Prunus* species. Special mention should be made of the progress in diagnosing the virus by its inclusion bodies, in studying its epidemiology and the distinction of strains. At the end of the book (in 'session' 14) valuable lists are given recording fruit tree virus diseases in Europe in 1965, 1968 and 1970, and virus-tested fruit tree varieties and rootstocks available for exchange.

Although many contributions deal with phytopathological aspects (symptomatology, epidemiology, diagnosis and control) because of the practical orientation of the majority of fruit tree virologists, several others skill do so since many of the viruses concerned can not or hardly be studied and diagnosed for their physical and chemical characters. The number of viruses of fruit trees that can be studied *in vitro* is steadily increasing, however.

The book has been well printed and illustrated but it could have been edited more carefully. This is demonstrated by the title of session 2 reading 'Description of viruses' where only diseases are being discussed, and by the acceptance of a paper (p. 221) claiming that sharka virus does not belong to the potato virus Y group, because the filaments found were about three times as long as normally accepted, and that pinwheel structures found by electron microscopy thus are not limited to this group.

This clearly indicates the problems involved in editing and publishing such proceedings, many contributions being preliminary reports merely of orientational value.

In spite of this, the book contains much information on recent developments in the field of fruit tree virus research.

L. Bos

Bos, L.: Symptoms of virus diseases in plants. Sec. ed. Pudoc, Wageningen (the Netherlands) 1970. 206 pp., 58 fig., 2 tables. Price Dfl. 20.—.

This book is an almost entirely rewritten and extended version of the first one published in 1963 and reprinted in 1964.

A new chapter on pathogenesis comprises sections, dealing with themes of some of the first edition chapters, such as introduction, sequence of symptoms, definition of disease and variation of symptoms. The latter subjects have been treated more extensively than in the first edition.

The chapter on description of symptoms has remained the most important one. Terms used to

describe symptoms caused by viruses are defined and clearly described. Very useful additions are the tables on colour deviations and malformations. However, descriptions of colour deviations alone are always a bit unsatisfactory. Therefore, it would have been a welcome addition if subtile distinctions between, for instance, the different types of mosaic and mottling had been illustrated by a colour plate. As this might have increased the price of the book considerably such a plate could have been included, replacing the one showing tulip with colour breaking in the flower which serves merely an aesthetical purpose.

Further valuable additions are the chapter on deviations resembling symptoms of virus diseases and a list of Spanish synonyms of names of symptoms besides the already existing ones of Dutch, German, French and Italian synonyms.

One might feel disappointed only where the author talks about biochemical and metabolic changes underlying the pathogenesis because of the rather superficial way in which the various processes are dealt with. The examples in this part of the chapter are rather arbitrarily chosen and Fig. 12 (ultra violet spectrum of 'healthy' and 'diseased' sap) does not add to a clear insight into the differences between a healthy and diseased plant. Moreover, some terms are not always properly used (e.g. transcription and reduplication on p. 43). These few shortcomings are, however, in no way derogatory to the value of the book as a whole.

The merits of the book as a systematic account of the data regarding symptomatology and its terms have considerably increased by the above-mentioned revisions and extensions. This second edition will prove to be very useful for plant virologists concerned with description of symptoms and for all students in plant virology.

J. Dijkstra

Nederlandse namen van planteziekten bij gekweekte houtgewassen. Commissie voor Nederlandse Namen van Planteziekten van de Nederlandse Planteziektenkundige Vereniging (P.O. Box 31, Wageningen, the Netherlands). Gewasbescherming 3 (1972) 1–31.

This is a list prepared by the 'Committee on Dutch Names of Plant Diseases' of the Netherlands Society of Plant Pathology. It concerns those cultivated woody plants which are qualified as commonly occurring in the Netherlands, with the exception of the fruit trees, a list of names of which has already been published in 1959.

Per host the Dutch names of diseases are classified according to the cause of the diseases (subsequently fungi, bacteria, mycoplasmas, viruses, nematodes, non-parasitic and unknown causes). The scientific names of the inciting organisms have been carefully checked. A detailed account of the nomenclature of the fungi has been published in Neth. J. Pl. Path. 78 (1972) Suppl. 1.

Besides an index of the Dutch names of the diseases, one of the names of the pathogens and other causal agents as well as of the Latin and Dutch names of the host plants has been added.

J. Dijkstra