BOOK REVIEWS

Crop Physiology—Advancing Frontiers by U. S. Gupta, (Published by Oxford and IBH Publishing Co., 66, Janpath, New Delhi 100 001) 1984, pp. 392. Price: Not known.

This compilation is a second in the series on Crop Physiology by the same author, the first one published in 1978. This one contains 10 Chapters. The subjects covered are of wide range and one of them, Biological Nitrogen Fixation under Chapter 4, is not directly connected to the main subject. Chapter 1 on Optimum Seed Size by M. L. Kaufmann, brings out the complexity of the problem but the data presented leaves us with a mixed feeling on the correlation of seed size with plant growth. Chapter 2 on Optimum Plant Population confines to field crops and goes into various factors which influence plant growth including pathogenic organisms affecting seed germination and seedling stand. This Chapter also covers the subject very superficially. Chapter 3 on Crop Efficiency for Solar Energy Conversions gives very valuable information and data for C-4 and C-3 plant species under tropical and temperate conditions. The author has taken considerable pains to collect very valuable information, compiled them meaningfully and interpreted the results in a very critical manner. The Chapter on Biological Nitrogen Fixation deals with all aspects including symbiotic, asymbiotic and associative systems. The treatment of the subject is very precise though not upto date in coverage. The Chapter 5 on Crop Lodging and Chapter 6 on Crop Ratooning are somewhat limited in coverage and hence of limited value. Chapter 7 on Boll Abscission in Cotton covers a narrow field, but in a thorough manner. Chapter 8 on Maximising Crop Productivity, Chapter 9 on Maximising Sugar Production and Chapter 10 on Production Potential of Grain Legumes are very well covered. The coverage of factors limiting productivity in sugarcane by T. A. Bull is very valuable and his suggestions for future consideration by the Physiologists, Agronomists, Breeders, Farmers and Processors are very valid. In the last Chapter on Grain Legumes, U. S. Gupta has presented useful data on the trend of increase in world production of grain legumes. He has compared the area and production figures in respect of a few species of legumes in the world with that of India. His suggestions for future lines of work on Breeding for high yield potentials are very valuable.

While the book has been published in 1984, most of the data and information presented as also the literature cited covers only upto about 1977–78. The only data covering upto 1980 are found in pages 323 to 327. Most of the data presented in the publication are outdated. In each branch there has been more information accumulated over the past 6 or 7 years. Perhaps there have been problems in getting the book printed well in time. However, what has been presented has been done well.

10, Sriman Srinivasa Road, G. RANGASWAMI
Alwarpet, Madras 600 018

Anophelines of India by T. Ramachandra Rao (Malaria Research Centre, Indian Council of Medical Research, New Delhi) 1984, pp. xvi + 518, Price: Rs. 150/-

This is an excellent treatise dealing with the various aspects of Anophelines of India. The book, divided into two parts, with 13 chapters, is a fine overview of one of the most important vectors in India and elsewhere responsible for the dreaded malaria. The author is a famous scientist and a well known technical expert best fitted to write this monumental work.

In view of the reemergence of malaria and some other mosquito borne diseases, especially in India and elsewhere, the book fills a desideratum. There is no doubt for an urgent need for malaria eradication at the grass-root level. Public health workers and paramedical scientists should seriously address themselves to the improvement of the present control measures. No effort should be spared to develop strategies for a gradual and sustained reduction, if not total obliteration, of the vectors (which may well nigh be impossible due to their mode of life) by reviving the old methods with modification or by introducing new control measures.

The book gives a balanced and comprehensive account of the research on Indian anophelines with special emphasis on bionomics, ecology and their

control. The literature accumulation on anophelines for the last three decades has been made use of with care and discretion. The treatise is good in format.

It is definitely an authoritative reference book of information dealing with the taxonomy of the group with keys for identification based on correct description, distribution, ecology, cytogenetics, use of insecticides, ethology and basic principles of mosquito control with some information pertaining to the species.

In Part I, general section, of the book, the coverage is as follows:

1. Emphasis is on the bionomics and ecology of the Indian anophelines with a detailed account of each species. A knowledge of the disease-producing vectors in different geographic locales of the country is essential for any sound control of malaria. The sum substance of all significant research provides needed information in one book to the researcher, more so if he is new to anophelines.
2. An up-to-date knowledge of the taxonomy of anophelines with revised keys for proper identification of the species, sub-species and varieties has been found useful.
3. The chapter on speciation, genetics and cytogenetics incorporating the valuable advances made during recent years to understand the behaviour, speciation, insecticide resistance and new methods of control.
4. A thorough knowledge of cytogenetics is essential for effective control methods involving the introduction of chromosomal translocations by using chemicals and radiations. But these methods may prove costly and time-consuming. As such studies are to be made first in the laboratory, the methods for colonization of anophelines have to be evolved immediately. Only very few species of anophelines could be colonized in the laboratory. Now the need for developing new techniques such as induced copulation must be tried to establish the laboratory stocks and then attempts made to rear the species. This would help in the application of genetic control methods both in the laboratory and in the field.
5. The chapter on 'Landmarks' in control of anophelines as a means to malaria control is highly relevant with the historical background. The learned author has focussed attention on the control measures adopted in different parts of India. The various eradication projects like the NMEP (National Malaria Eradication Program) and their achievements have been briefly discussed.

Various control methods by the use of insecticides such as DDT, BHC, Dieldrin etc. are described and their merits and demerits are analysed. It is interesting to note that Dr Rao with Dr Viswanathan was the first to demonstrate the utility of DDT as a residual spray. The results formed the basis for launching the NMEP in India using DDT. In fact, during the 30's his in-depth studies of *Anopheles culicifaces* and later with Paul Russel, were deemed a classic work during the pre-DDT era. The data was utilized by McDowel for his mathematical model. Dr Rao was the first to launch environmental manipulations for vector control which helped to eradicate malaria from North Kanara during the pre-DDT era. He was the first to study the vertical distribution of mosquitoes in an evergreen forest in 1934. He also studied Haematophagous arthopoda.

Biological control methods are generally economical and have the great advantage of not polluting the environment, especially drinking water. The author has listed various naturalistic methods of control such as the use of parasites and predators, weeding of aquatic plants, destruction of breeding sites etc. Though these methods are not fool-proof they are worth a trial, with improvements, even today. It is gratifying to note that WHO itself now supports his idea of vector control using simple methods for a large country like ours with community participation. One wishes that some of his ideas had been put into practice years earlier.

6. The chapter on resistance to insecticides deals with the history and present status of resistance of Indian anophelines to their use. A compilation of such materials on the physiological and behavioural resistants of several species will be of great use to the workers in the field.

Part II of this book on individual species gives detailed information on the biology of all the species, sub-species and varieties found in India. This chapter gives information on the taxonomy, distinguishing characters, distribution, prevalence, adult bionomics, larval ecology, relation to disease and the control of each species, separately. This kind of information for Indian anophelines is of great value. The book will be of immense use to both research workers and students of general biology who may aspire to take up advanced research in mosquito work.

The treatise contains useful appendices regarding keys for identification of anopheline mosquitoes, entomological techniques, changes in place names, designation of types, conversion tables, references,

indices regarding mosquito names, maps and tables.

Dr Rao was a great source of encouragement and inspiration to younger scientists. The scientific fraternity of India and elsewhere will solely miss the guiding spirit of this doyen of Indian science for many years to come.

Dr T. Ramachandra Rao passed away on 8 November 1984.

M. D. PARTHASARATHY
93/1 'Mala', Vanivilas Circle,
Basavanagudi, Bangalore 560 004

NEWS

NATIONAL RESEARCH DEVELOPMENT CORPORATION – AWARDS FOR INVENTORS

The awards for meritorious inventions are announced by the National Research Development Corporation (NRDC) twice a year – on Republic Day and on Independence Day.

The following are the recipients of the 1985 awards:

Dr K. S. G. Doss of Madras has been awarded Rs. 25,000/- for the development of 'transient heater'. This is a device incorporated in the pug mill and used in the sugar industry. By this device, the viscoity of the 'C' type massecuite (industrial term for sugar-molasses mixture prior to the removal of molasses) is reduced which helps in the efficient operation of the centrifuge and hence in the recovery of additional quantity of sugar.

Other seven awards, have been shared by the following 15 inventors:

Mr. M. J. Joseph Muthukulathil of Cannanore district of Kerala has been awarded Rs. 15,000/- for the development of 'palm climber'. The inventor has developed this device which enables any person to climb tall trees, especially palm and areca, in all climatic conditions with sufficient security. The device is safe, simple and within the reach of small farmers.

Mr. Pritam Singh Bajwa of Bilaspur (Rampur, U.P.) has been awarded Rs. 15,000/- for the development of 'gobar gas plant, using polythene and angle iron instead of the conventional brick masonry type digestors'. This leak-proof digestor is made of low density polythene sheets wrapped around a frame made of angle-iron bamboos. Mr. Bajwa's design enables the digestor to be erected in reduced time and cost compared to the conventional method.

Mr. Pretam Singh Takur of Bilaspur, H.P. has been awarded Rs. 10,000 for the development of an 'elevation meter' which is useful for training security personnel.

Mr. Chowdhury Nath Saikia, Mr. Prafulla Pran Barua and Mr. Bani Prasad Chaliha of the Regional Research Laboratory, Jorhat have been jointly awarded Rs. 10,000 for the development of 'direct copy paper'. A coating formulation has been developed with locally available materials which could be used to coat one side of the paper. This coated paper can be used for taking copies. The product would be useful for teleprinter rolls, invoices, bills, etc.

Dr Rajendra Kumar, Mr. C. S. Siva Ramakrishnan and Mr. R. K. Mahanti of Jamshedpur, have been awarded certificates of merit for the development of 'NML reactive filter for aluminium and in alloys'. This is a new concept of filtering molten aluminium. The use of the filter reduces the level of dispersed solid particles, inclusion of oxides, dross, etc and improves the grain structure of the cast product.

Mr. P. R. Eknath, Dr Vijay P. Bhatkar, Mr. S. Sasi Kumar, Mr. Shibu Philip, Mr. S. Raja and Mr. S. N. Raja of the Electronics Research and Development Centre, Trivandrum, have been awarded certificates of merit for the development of 'programmable, control of process industries and power plants'.

Dr B. V. Katti of Dharwar has been given a certificate of merit for the development of a 'Kannada typewriter' with 60 type keys to achieve highest speed.

The Corporation has also announced financial assistance of Rs. 10,000 to Mr. K. X. Benedict of Cochin for development of 'mobile pneumatic rock breaker'; in this, a hammer weighing 75 kg will be operated from a pneumatic cylinder for primary crushing of rocks.