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**BOOK REVIEWS**


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**Pollination Biology—An Analysis**, (ed.) R. P. Kapil, (Published by Inter-India Publications, No. 17, Raja Garden Extension, New Delhi 110 015), pp. 300, Rs. 245 -.

This book is a compilation of 31 scientific articles together with a Prologue by K. Faegri and an Epilogue by G. B. Deodikar. The papers were presented at a Symposium held at Haryana Agricultural University, Hissar, organized by the Editor R. P. Kapil. The papers are grouped under two headings, viz (1) Pollinators' Reactions to Flowers and (2) Flowers' Reactions to Pollinators. In all, thirty-nine authors have contributed to the publication.

Palynology and Pollination Ecology are very important subjects, but not much pursued in this country. Likewise, the concept of the evolution of floral diversity in relation to pollination has also not been investigated much. Therefore, this compilation of original articles and reviews by the leading scientists in this field is of great value. It is hoped that it would lead to more intensive research in various branches of the two major areas in the coming years. The Prologue by K. Faegri is very brief and to the point wherein he makes out that the pollinators of cultivated crops and their varieties have evolved themselves over the centuries and decades, but the research on these aspects is deplorably insignificant. He also states that the pollination processes have been studied exclusively from the point of view of the plant and not the pollinators. It becomes important therefore that there should be inter-disciplinary approach for better understanding of the inter-relationships between the pollinators and the flowers. The modifications in the morphological features of the pollinator insects and the floral parts have been brought out by some of the articles. Very basic and fundamental information of pollination syndromes in some cucurbits and graminaceous plants have been described. The data presented by some of the authors are very basic and impressive. The illustrative diagrams and plates add value to the publication.

The editor is to be congratulated on presenting the papers in a uniform pattern, each paper carrying an Abstract as the first paragraph. The book will be very useful for the research workers in this field and

it would stimulate more workers to take to this potential field of biological research of inter-disciplinary nature.

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**SAFETY GUIDE** [Published by Organization of Pharmaceutical Producers of India, (OPPI), Bombay 400 001] 1986, pp. 167, Price not given.

With the Bhopal tragedy still vivid in our memories an important concern for every industrial and academic laboratory is an effective safety and occupational health programme. This new book helps to meet this vital need.

Safety Guide is the outcome of a laudable attempt of the R and D Committee of the Organization of Pharmaceutical Producers of India (OPPI) to prepare a manual for the immediate and express use of its members. Thus, although intended primarily for the use of the operating personnel in the pharmaceutical industry, the Guide contains material that can be used gainfully by anyone involved in laboratory and plant work and even by our science teachers and graduate students.

The book, brought out thoughtfully in a loose-leaf binder, begins with an account of the statutory regulations and uses extensively excerpts from the Maharashtra Factories Rules, 1963 as amended up to 1983. This is followed by an exhaustive chapter on Air Pollution Control. Chapter 3 dwells upon the organization and responsibilities and lays down in clear terms a model safety and environment control policy for a company. Details such as the constitution and responsibilities of a central safety committee and departmental safety committees are spelt out clearly. There is also a suggested format for safety audit in the form of a checklist. This is followed by a well-written chapter on good house keeping. Chapter 5 is an unusual yet a competent account of risk analysis. The manual then proceeds to discuss the need for a fire safety plan—fire prevention and fire fighting procedures are very clearly discussed. The need for a safety training and

education of staff at various levels is also stressed. Recognising that occupational health hazards constitute an important element in the safety game, the Guide includes a chapter on first aid, health emergencies including an in-plant accident reporting system. The need for formulating emergency/disaster control plans is also briefly touched upon. The manual rightly recognises the responsibility of the industry towards effective environmental control. This is brought out in the form of summarizing the important sections of the Environment (Protection) Act 1986. Monitoring equipment used in control studies is briefly referred to. Chapter 11 is an excellent account of do's and don't's in several operation procedures in the laboratory and plant such as handling of compressed gas cylinders, This is followed by an equally well written account of laboratory safety. The final chapter deals with safety procedures in such diverse activities as welding and gas cutting, electrical lock out, materials handling, electrostatic hazards etc. This chapter also includes a brief description of hazardous chemicals in the form of a data sheet.

This reviewer would like to congratulate the R and D committee of OPPI for bringing out such an excellent manual in a most readable fashion. Though addressed specifically to the pharmaceutical industry, this manual should be of use to everyone involved in laboratory and plant work using chemicals.

Available from the Organization of Pharmaceutical Producers of India, Bombay, there is no indication of price of the manual. It is hoped that this organization would make this manual available at a reasonable price to others also.

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**The International Rice Research Institute, Annual Report for 1985, Published in 1986 by IRRI, Los Banos, Laguna, Philippines, pp. 555 + xx.**

The research work of the International Rice Research Institute is presented under eleven topics namely, Genetic evaluation and utilization programme (GEU), Control and management of rice pests, Irrigation water management, Soil and crop man-

agement, Climatic environment and rice, Constraints on rice yields, Consequences of new technology, Cropping systems programme. Machinery development and testing, training and cooperative programmes.

Under the genetic evaluation and utilization programme innovative breeding methods are presented by the plant breeding and plant physiology departments. Work on the biochemical markers, identification of genes coding for isozymes, their mapping and classification based on these enzymes is in progress. Anther culture, somatic culture and somatic embryogenesis are being attempted. Low efficiency of callus production and green plant generation are some of the constraints in the anther culture as applicable to rice breeding.

Control and management of rice pests deal with diseases, weeds and insects. Sheath blight is caused by *Rhizoctonia solani*, sheath spot is caused by *R. oryzae* and aggregate sheath spot by *R. oryzae-sativae*. Attempts are being made to control these diseases through biological methods using both fluorescent and non-fluorescent bacteria. The other studies include recovery of rice tungro virus (bacilliform) from infected plants, serodiagnosis, of viruses and ragged stunt virus. Cycloprothorin, Fenprothrin, cypermethrin, carbofenthion and buprofezin are some of the chemicals that are being tested against the rice pests. Six 'insectistics' were evaluated against army worms of which Tritlumuron, DU 415 146 and HOE 522 were promising. The granulars evaluated are cartap 4G propahos 5G, carbosulfan 5G, isazophos 3G, MTMC plus phenothioate 3 plus 3G, BPMC 4G, Chlorpyrifos against tungro virus. Cartap was found to be the best.

Herbicide screening is being done in irrigated transplanted rice, upland rice, irrigated wet seeded rice and deep water rice. Methods are being evolved to reduce the herbicide phytotoxicity in wet seeded rice. In the integrated weed management it was found that most of the herbicides significantly reduced the fresh weight of *Azolla* at 20 days after herbicide application. Molinate, simetryn, MCPB killed *Azolla* but thiobencarb was least damaging.

Department of water management and agricultural economics have presented results on improving agricultural efficiency of a pump-based irrigation system, financial viability of Libmanan Cabusao pump irrigation system (LCPIS) and strategies for improving rice production in flood prone environments.

Experiments reported under soil and crop man-

agement deal with soil characterization, management of soil and fertilizer nitrogen, biological nitrogen fixation, azolla management, organic manures and management of other nutrients, rice crop cultural practices, tillage and management of soil physical conditions. *Sesbania* when incorporated into the soil as green manure gave yields comparable to prilled urea. Results of experiments on biological nitrogen fixation, photodependent nitrogen fixation, *Azolla-Anabaena* symbiosis are also presented in this section.

The departments dealing with multiple cropping have given results on the performance of Gunn-Bellani solar radiation integrator and the effect of weather on rice yields and response to rice to weather variables. The yield constraints dealt with are socio-economic, management constraints in wet seeding, upland rice, direct seeded rice and transplanted rice.

Analysis of the economic efficiency in rice production in Punjab, Pakistan using a 'composed error' stochastic profit function was estimated and it was found that variation in actual profit from maximum profit between the farmers arose mainly from differences in farmer practices as applied to random variability. The agricultural economics department has dealt with technology change policy and equity in the Indonesian rice economy, determinants of fertilizer use in Asia, rice production stability, energy and rice production and impact of mechanical reaping and the usefulness of axial flow thresher.

It would appear that India has one of the most unfavourable ratio of price of urea N to price of paddy. The other areas where experimental data are discussed are under cropping systems programme which include agricultural management in rice based cropping systems of green manuring, intercropped rice and grain legumes and nitrogen management in rice based cropping sequences.

Agricultural Engineering Department is developing implements for use in rice based cropping systems which include minimum tillage puddler, green manure incorporating knives, upland seeder, root-washed seedling transplanter, plunger-auger injector for fertilizers, conical weeder, rotary drum dryer, rice hull carbonizer and charcoal briquetting. Ten manufacturers are now fabricating IRRI designed equipment in Southern states in India according to the report. Reapers, threshers and transplanters are being introduced. Results on the biogas production from rice residues and batch type biogas generation are presented. Mention is made of research oriented training programmes, special courses and cooperative programmes of international rice testing.

The Annual Report of IRRI will be most useful for all our Agricultural Research Institutions.

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## NEWS

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### DRUG RESISTANCE IN MALARIA PARASITES

Drug pressure is the major factor responsible for the selection of resistance in malaria parasites and should be reduced to a practical minimum. The use of subcurative doses of drugs contributes most to this selection process and it follows that radical curative treatment, i.e., the administration of drug doses that are more likely to eliminate the parasite completely, is probably the most reliable way of

avoiding selective parasite survival. Mass drug administration for suppression, with all its associated problems including the haphazard use of drugs, should therefore be avoided. One of the safest ways of reducing the spread of resistant parasites is to reduce or interrupt malaria transmission. (*World Health Forum*, 1987, Vol. 8, No. 1, p. 20, World Health Organization, 1211 Geneva, Switzerland)

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