BOOK REVIEWS

PHOTOSYNTHESIS IN PLANTS

To those interested in plant growth processes this volume provides a thorough, comprehensive, and up-to-date presentation of the work on photosynthesis. Under the able leadership of the editors, the chemical and physiological approaches have been brought together in a valuable and easily readable volume which provides a ready reference to photosynthesis, ranging from chapters on "Photosynthesis Under Field Conditions" and "Products of Photosynthesis" to "The Quantum Requirement of Photosynthesis" and "Investigation of the Chemical Properties of Intermediates in Photosynthesis".

The monograph contains 22 chapters prepared by leading authorities, all with a critical well-balanced approach to this most important chemical reaction. Included in each chapter is a description of techniques and apparatus used in the various physiological and chemical approaches to the problem under discussion. Where applicable, line drawings, graphs, and halftone pictures supplement the text. Each chapter includes a list of references to published research on that phase of the problem.

While this volume may seem to be of greater interest to those working directly in the fields of plant physiology and plant chemistry, agronomists will receive considerable value from it as an aid in the interpretation of field plant problems through a better understanding of the process of photosynthesis.—V. G. Sprague.

THE PERIODIC PARTIAL FAILURES OF AMERICAN COTTONS; THEIR CAUSES AND REMEDIES

This book represents a comprehensive and orderly restatement of the author's research in Punjab between 1935 and 1942, and in Sind between 1943 and 1946. Most, or all, of the data have been previously published (with the author's Indian colleagues) in a series of 16 articles in the Indian Journal of Agricultural Science. Thirteen of the fourteen chapters deal with the recurrent failure of the bolls of American cotton in India to complete their development—a physiological effect known as tirak. Notwithstanding the restricted object of the investigation, the result is an important contribution to knowledge of the physiology of the cotton plant by an outstanding physiologist. The American cottons dealt with are small binned (2 or 3 grams of seed cotton), markedly photoperiodic, derivatives of tropical American Uplands (G. hirsutum) unrelated to the races acclimatized in the Cotton Belt of the United States.

The occurrence of tirak was found to be confined (1) to sandy soil low in nitrogen and (2) to sandy soils amply supplied with nitrogen but having sodium saline subsoils. The prominent symptom in the first instance was a yellowing of the leaves accompanied by malformations of the chloroplasts and the accumulation in the leaves of starch and a tannin-like material. In the second instance the leaves remained dark green but wilted severely in late summer (designated physiological drought). The immediate cause of the premature opening of the bolls, the immaturity of the seed, and the poorly developed lint was assigned in both instances to insufficient potassium in the seed for normal protein synthesis. Ammonium sulfate applications, in the first instance, increased potassium uptake and yields. In the second instance, the poor uptake of all minerals, including potassium, was attributed to the wilting. Heavier rates of planting in June, in place of the customary May plantings, were found to improve maturity and yields on the saline soil. The severity of the disease is shown to be correlated with years of high September and October temperatures. When not affected by tirak, seed cotton constituted about 20% of the dry weight of the entire top of the plant whereas in the bad years this fell to 10%. (In our Cotton Belt, under fairly good conditions, the weight of seed cotton is around 40% of the above-ground weight of the plant.)

The book has no index. There is perhaps some unnecessary repetition but the data are well presented, concisely discussed, and the author's reasoning is stimulating throughout. The cotton growers of Punjab and Sind should be highly gratified over the remarkably practical solutions developed by Dr. Dastur for their acute problem.—Frank M. Eaton.