The Punjab is the fabulous “land of the five rivers” at the foot of the Himalaya Mountains in the upper reaches of the great Indus River System. Cotton has been grown on the flood plains along the banks of the Indus since the time of the ancients, as early as 3000 B.C. However, production was never large until perennial irrigation was begun about the turn of the century. Now, the Indus Valley has one of the largest irrigation systems in the world, serving over 19 million acres. While part of the cotton area is in the lower province of Sind, most is in the Punjab. The water in the upper valley is not yet being used to capacity, and new irrigation facilities are continually being constructed. Considerable expansion in cotton acreage is envisioned. With the accent on expansion, the quality improvement program is particularly important.

The Punjab was divided in 1947 by the partition of India. The western two-thirds, which incidentally includes most of the cotton area, practically all the irrigation facilities, and the most fertile land, is now in Pakistan. The other third is in the Indian Union. The report, written before partition, treats the entire area.

While the book is extremely interesting to laymen from the standpoint of the country itself and the economic significance of the expanding cotton program, it is primarily a scientific treatment of 20 years research on the development and improvement of the plant in the area. Actually, this is the official final report of the Punjab Botanical Research Scheme, initiated in 1925 by the joint effort of the Punjab Government and the Indian Central Cotton Committee.

The author, Dr. Muhammad Afzal, now director of cotton research for the Pakistan Government, was for the last 14 years chief botanist at the Cotton Research Laboratory in Lyallpur. For the first 6 years of the project he was the assistant to Mr. Trevor Trought, who left to take a post in the Anglo-Egyptian Sudan.

The first part of the report covers the background studies of the fundamental aspects of the cotton plant’s life from germination to maturity and the lint and seed characteristics. This is probably the most complete comparison which has been made of the habits of the three principal commercial species: the *Arboreum*, the *Herbaceum*, and the *Hirsutum*, all of which are produced extensively in the area. Aside from the interesting habits and characteristics observed which will be important in further improvement efforts, the research also resulted in some practical recommendations on such things as optimum sowing dates.

From his study of the purely scientific aspects of chromosome structure in cultivated and wild species, Afzal suggested slight modifications in the classification. His work in cyto-genetics resulted in a finer and longer linted hybrid produced from a cross of a wild species *G. anomalum*, characterized by its fine long lint, and *G. arboreum*, characterized by its rough and very short staple.

A number of practical recommendations also developed from the extensive work in cotton agronomy, such as the best dates for planting, the optimum amount and frequency of irrigation, spacing, etc. Interestingly enough, experiments to date have indicated artificial fertilizers do not pay. Afzal suggests the high degree of alkalinity of the soils may have a bearing on the problem.

The most significant part of the report is the improvement made in the varieties. The average staple length, the spinning qualities, and the ginning out-turn have been noticeably improved. There has also been some improvement in yields. Whereas, when the research program was undertaken in 1925, more than three-fourths of the crop was below 7/8 inch in staple, at the end of the period about 82% was listed as being 7/8 inch and longer in staple. A large percentage of the crop is now produced from adapted American upland cottons which staple from 29/32 inch to 31/32 inch.

The most spectacular achievement, Afzal believes, is the recent development of American upland cottons with a staple length of 1 1/8 inches and above with very good spinning and yielding properties. He thinks the new cottons may soon be produced on about 1 million acres. — Read P. Dunn, Jr.

**MONOGRAPH OF THE GENUS DIGITARIA**


Although not a genus with many, or well known, agronomic species, *Digitaria*, being composed of grasses, must be of interest as a whole to all agrostologists, and in part to many other readers of the Journal. Perhaps the best known members are the introduced crabgrasses which appear as weeds in lawns and cultivated areas, but there is always the possibility that in the future one of the perennial species from Africa may prove to be a forage plant of value.

Henrard, who will be remembered for his definitive treatment of *Aristida*, has developed four subgenera in the course of his conservative treatment of *Digitaria*. One of these, Americans will be surprised to discover, is monotypic and comprised merely of *Leptoloma* Chase. By far the bulk of the species of fingergrasses are placed in the subgenus Eu-Digitaria. One of the 32 sections into which Eu-Digitaria is divided is the genus *Trichachne* Nees. Thus in these and other cases (cf. *D. laeviglimis* Fernald) this new world-wide treatment is in disagreement with Hitchcock’s Manual, the standard reference for most of the grass nomenclature used in the United States.

Obviously a labor of love and of many years patient organization, the volume was delayed in publication by World War II. In outline, it first treats species alphabetically, with profuse quotations of original descriptions, and then keys them. Most type specimens are illustrated. — A. A. Beetle.