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CONFERENCE OF RESEARCH WORKERS ON COTTON IN INDIA

Cotton workers in India should be grateful to the Indian Central Cotton Committee for arranging a conference—the first of its kind in India—of all those engaged in problems connected with this crop. The conference came off on the 4th to 6th of March last and was presided over by Sir Bryce Burt, C. I. E., on the first day and by Dr. Burns on the two succeeding days. A fairly large number of workers from various cotton growing provinces as well as many professors from several scientific institutions at Bombay were present. Twenty-six papers dealing on different aspects of cotton growing and technology and three important subjects relating to the procedure to be adopted in future were placed before them for exchange of views and recording their considered opinion.

In opening the conference Sir Bryce Burt rightly stressed on the importance of such scientific gatherings which, to quote his own words “do much to defeat distance and to mitigate that intellectual isolation which fortunately is so often the lot of the scientific worker in India” and “broaden the outlook of every cotton research worker by bringing him in touch with those working in the other branches of science”.

The conference is reported to have been a great success which was no doubt due to the great care and untiring efforts of the Secretary, Indian Central Cotton Committee in arranging the details and the very able guidance of its presidents. It is hoped that the discussions at the conference would have the desired beneficial effect.

A noteworthy feature of the conference which had been responsible for the high level of the discussion was the circulation, beforehand among those who were expected to attend the conference, of full copies of all the papers presented.

In briefly summarising the papers and discussions of the conference, we are sure we will be supplying our readers with a topic of great interest and considerable importance.

Plant Breeding :—Mr. J. B. Hutchinson read a paper on “The distribution of *Gossypium* and the evolution of commercial cottons”. After considering the distribution and relationship of cotton species, he came to the conclusion that from perennial, highly monopodial, and bushy forms, early annual, and sympodial

types have been developed in recent times in response to the selective influences of short growing seasons and cold winters. He added that two lines of development in the case of Americans could be postulated. In the moist tropical regions the perennial types continued to thrive, but on the plateau the annual forms had the advantage and the modern demand for high cropping power accelerated their spread. He said that the same agency was at work even in the case of Asiatic cottons. Annual types arose in *arboreums* at four centers differing in environment. He opined that the South Indian *arboreums* were different from those developed in Northern India. The former was characterised by having low ginning percentage and fine fibres, whereas the latter had coarse fibres in abundance. The North Indian *arboreums* spread rapidly when great importance came to be attached to high ginning percentage. He further said that *G. herbaceum* was most probably a native of Africa and was introduced into India in fairly recent times. He concluded by saying that the line of meeting of 13 chromosome cottons of Asia with similar ones of America to form the 26 chromosome allo-poly-ploid groups should have been across the Pacific and not across the Atlantic ocean as formulated by Davy.

Mr. P. Abraham and V. Ramanatha Ayyar in a paper on "Floral Anatomy as an aid to classification of cottons" reported about the possibility of utilizing the vascular anatomy of the flower in the classification of cotton species. The wild types were found to differ from the cultivated in having a fewer number of vascular strands. As per this criteria, *G. religiosum* had to be deemed nearer to wild types than *G. hirsutum* and *G. barbadense*. The Old World cultivated forms would appear to fall under two distinct groups viz., the *herbaceum* and the *arboreum*. It was further found possible to divide each one of these two groups, into two distinct sub-groups. From the mode of grouping of the bundles it seemed probable that the *herbaceum* was the Asiatic parent for the New World 26-chromosome group of cottons. Anatomically the *arboreums* would appear to be nearer than the *herbaceums* to the Asiatic wild cottons.

Messrs J. B. Hutchinson, P. D. Gadkari and M. A. A. Ansari, contributed a paper on "The genetics of *Gossypium* and its application to cotton breeding". After surveying the contributions of theoretical genetics to the equipment of the cotton breeder, the authors drew the attention of workers to the need for conserving the genetic variance of the material until the mean value has been raised to the required degree. The usefulness of crop-surveys in ascertaining the survival values of crop constituents was pointed out by reference to the powerful effect of natural selection in maintaining the crop composition against the pressure of the introduction of *roseum* seed by human agencies in Malwa.

Mr. V. Ramanatha Ayyar while discussing "some aspects of cotton Breeding work in India" stated from his experience in Madras, that attempts at increasing the length of the staple of Asiatic cottons, generally resulted in a general decrease in the yield. In American cottons there was always a good combination of yield and quality, and he therefore suggested the introduction of fresh material directly from Central America, the natural home of American cottons. He attributed the failure of American cottons in India to the fact that only types which had been acclimatized in the United States of America, Egypt or South America were imported. He referred to the fact that countries like China, Russia and also Africa which were once growing Asiatic cottons are now replacing these with American cottons.

Mr. K. I. Thadani presented in his paper the history of cotton-breeding work, and the introduction of improved strains in Sind. Mr. D. N. Mahta gave an account of cotton-breeding work in Central Provinces and Berar. Mr. K. Sawhney referred to the problems connected with the production and introduction of improved strains to replace the existing mixtures in the Hyderabad state.

Mr. V. Ramanatha Ayyar while describing the effect of X-rays on *upham* and *karunganni* cottons mentioned the stimulating effect of treated pollen on succeeding generations and the occurrence of uneconomical and recessive mutants in the second generation of treated seed.

Agronomy: Mr. B. M. Dabral contributed "A note on factors in the acclimatisation of exotic varieties of cotton in Sind". Local or *Deshi* cottons gave the highest percentage of germination, and were least affected by white ant and by the fungus causing "damping-off." In April sowings, *deshi* plants suffered least from high temperature and strong winds. The long stapled *hirsutum*s were subject to jassid attack and the Cambodia and Egyptian cottons preferred a lower range of temperature for their fruiting than the Americans or *Deshi*. The Sea Island cotton was reported to possess a staple of $1\frac{3}{8}$ to 2 inches in its original home never produced in India a staple longer than $1\frac{1}{4}$ to $1\frac{1}{2}$ ".

Mr. M. A. Shama Iyengar in a paper on "The saline soils of Sind and the cotton plant" referred to the tolerance of cotton to salinity. He suggested the possibility of utilizing cotton for removing sodium salts since cotton removed as much as 126 lb. of sodium chloride per acre and since cotton could be grown without rotation for a period of at least six years. He further pointed out the need for growing cotton instead of keeping the land fallow after the soil had been leached with water. In his opinion the *Deshi* selection 27 W. N. and the American selection 285—F₂ show comparatively greater tolerance to salt.

Mr. M. K. Barakzai in his paper on "cotton agronomy in Sind" referred to the introduction of drill sowing to facilitate interculture with bullock power, and to the need for irrigations at longer intervals during the earlier growth period and frequent waterings at shorter intervals during the reproductive phase of the plant.

Mr. M. Mohammad Afzal read a paper on "Watering experiments on cotton" in the Punjab. The ridge versus flat sowing gave indifferent results and the extra cost of ridging and hand sowing did not appear to be justified. Irrigations at intervals of every three weeks benefited the crop more than irrigations at longer intervals. In the years of average rainfall, first two irrigations should be given at an interval of three weeks and subsequent irrigations after every fortnight. The local practice of delaying the first irrigation for five or six weeks after sowing was definitely detrimental, it being essential to irrigate three weeks after sowing. On an average 24 to 28 acre inches of water were required for a good crop of 4 F in the Punjab. On the whole, frequent irrigations were found conducive to the production of long and mature fibres but it did not lead to neppiness or to an increase in the highest standard warp count.

Cotton Technology. Dr. Nazir Ahmad and V. Venkataraman read a paper describing the influence of twist on yarn strength. They said that the spinners would desire to keep the twist as low as possible because increase in the twist reduced the output of yarn. Certain amount of twist was however necessary to furnish strength to the yarn. By altering both the count and the twist, evenness, breakage andlea strength of yarn from certain short medium and long stapled varieties were determined. It was found that even though it was possible to spin experimentally certain cottons upto very high counts, in the industry they were seldom spun upto that high limit. It is therefore necessary to carry out tests on new varieties under certain rigid conditions.

Mr. R. S. Koshal and Nazir Ahmed in a paper on "Effects of rainfall on the quality of Indian cottons" presented the results of tests carried out for nearly ten years on standard Indian cottons grown on the various research stations. About onethird to half of the total annual variations was found to be due to rain.

Rain during the picking period proved harmful. Additional rain above the normal was beneficial if received during the maturation period, and with it were generally associated high temperature and humidity which probably benefited the proper thickening of the fibres. While interpreting the effect of rainfall on spinning value it was observed that, the change in the spinning value occurred with the change in the fibre length as well as fibre weight.

Mr. A. N. Gulati reported, that micro-organisms aided by high temperature and humidity which prevail in Bombay, caused the deterioration of Broach Palij cotton during storage. The stained and matted parts of the lint were found to be heavily infected with micro-organisms. The middle of the bale appeared to be a more favoured site for infection than the top and that some of the fungi obtained were well known cellulose decomposers.

Pests. Khan Bahadur M. Afzal Husain while presenting a paper on "The cotton jassid" stated that number of eggs laid on some varieties of cotton were definitely less, indicating that although the nymphs might breed on various types of cotton, certain types might lack in certain nutritional substance with the result that the adults hatched out of such eggs would not be able to lay eggs. This indicated that hairiness and some other factor in the plant went together to produce a jassid resistant type.

Mr. B. P. Deshpande gave "A brief account of the investigations on spotted boll-worms in South Gujarat". He explained that the pest is a serious one and is carried over by stray living cotton plants; and it is effectively controlled by pulling out these stray plants.

Speaking on the question of "The control of pink boll-worm" Mr. P. B. Richards stated that carry-over in the United Provinces was almost entirely in the seed, and that treating the seed with heat killed the insect. Mr. Nangapal found that the pest was carried over in Marhatwada, Hyderabad State through soil where the larvae went for pupation. Mr. Richards suggested that perhaps the soil temperature in Hyderabad was not high enough to kill the pupae but in the United Provinces during summer, lethal temperatures were reached in the soil.

Wilt resistance. Dr. B. N. Uppal speaking on "Breeding for wilt resistance in cotton" pointed out the necessity for conducting rigorous tests for resistance in the greenhouse, since under field conditions, plants which escape disease may be mistaken for the resistant plants. The fungus which under ordinary conditions lay quiescent in the field emerged when environmental (chiefly soil temperature) conditions became favourable. The degree of soil infestation by the parasite also varied. It was therefore important to have a standard technique under which selection for wilt resistance should be done, so that the results could be compared at all times. He therefore suggested that after the plant breeder was satisfied with the performance of the strain, it should be passed on to the pathologist for tests in a series of soil temperatures and in glass houses under optimum conditions. If further selection was necessary, the pathologist would carry them out.

Mr. Hutchinson speaking on the subject, referred to the inter-dependence of wilt resistance and other commercial characters which facilitated the breeding of resistance and commercial characters in one and the same strain. He further suggested that provided the resistance was sufficient for commercial purposes (95 per cent.) and the strain proved homozygous for wilt-resistance, it was not necessary to aim at 100 per cent. resistance, because it was extremely difficult to successfully introduce all factors into one type by hybridization.

The conference after considerable discussion agreed that the breeding of strains immune to wilt under optimum conditions should be the ideal to aim at.

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but for agricultural distribution, 95 per cent. resistance under heavily infected field conditions might be deemed satisfactory provided the strain had been shown to be practically homozygous for that degree of resistance to wilt. It was decided that the conditions under which field tests are carried out should be described and standardized as far as practicable; and the pathologist should also conduct tests for homozygosity and select from the material should it be heterozygous.

Statistics. Mr. V. Panse drew the attention of the conference to the necessity for conducting varietal trials in representative localities before undertaking the distribution of a new strain and suggested a scheme for conducting such trials.

Rao Bahadur Mr. Vaidyanathan invited the attention of workers to the need for evolving a suitable sampling technique for different types of observations on cotton, and outlined the general principles of sampling methods which should be kept in mind.

Mr. Ramanatha Ayyar initiated a discussion on the supply of standard Indian cottons for test to the Technological laboratory. The conference decided that plant breeders should observe the conditions specified by the Director, Technological Laboratory and supply the samples accordingly. The crop should be grown on normal fields and the best seed should be used. The samples must be taken from the various pickings individually as well as collectively from all the pickings.

J. S. P.

The attention of our readers is invited to the two advertisements published in this issue, calling forth applications from agricultural graduates.