

**INDIAN
CENTRAL COTTON
COMMITTEE**

**TWENTY-SEVENTH
ANNUAL
REPORT**

1948



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of the

**INDIAN
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for the year ended

31st AUGUST,

1948.

CONTENTS.

CHAPTER I.

	PAGE
<i>General</i>	1

CHAPTER II.

<i>Partition and the Cotton Problem in India</i>	6-9
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CHAPTER III.

<i>Cotton Statistics</i>	10-22
Indian Cotton Situation—1947-48	10
Staple length of Indian cotton	15
Statistics of Stocks of cotton held in the country	17
Demand for various types of Indian cotton	18
Indian mill consumption	18
Exports	19
Statistics of cotton pressed	19
Unpressed (loose) cotton statistics	19
Statistics of cotton ginned	19
Improvement of cotton forecasts	20
Supply of monthly reports on Indian cotton to the International Cotton Advisory Committee	20
Scheme for crop estimating survey on cotton in the Central Provinces and Berar	20
Publications	22

CHAPTER IV.

<i>Research</i>	23-57
Cotton Technology	23
Fundamental Research Work on Cotton	26
Cotton Research in Provinces and States	38
<i>Bombay.</i> —	
(a) Broach Cotton Breeding Scheme	38
(b) Jalgaon Cotton Breeding Scheme	40
(c) Scheme for breeding wilt-resistant cottons in Surat area	41
(d) Scheme for improvement of Wagad cotton at Viramgam, Jagudan and Bavla	42
(e) Scheme for improvement of Dharwar-American cotton	43

	PAGE
<i>East Punjab.—</i>	
Scheme for improvement of cotton of south-eastern districts of the Punjab	44
<i>Central Provinces and Berar.—</i>	
Central Provinces and Berar Cotton Breeding Scheme	45
<i>Madras.—</i>	
(a) Scheme for improvement of Mungari cotton in Madras Province ..	46
(b) Scheme for improvement of Cocanadas cotton in Madras Province ..	47
(c) Scheme for breeding Cambodia cotton in Ceded Districts in Madras Province	48
<i>United Provinces.—</i>	
Scheme for hybridisation in <i>arboreum</i> cottons	49
<i>Assam.—</i>	
Scheme for improvement of Hill Cotton in Assam	50
<i>Hyderabad State.—</i>	
(a) Gaorani Cotton Improvement Scheme	51
(b) Scheme for improvement of cotton in Parbhani district	52
(c) Scheme for improvement of Kumpta cotton	54
<i>Baroda State.—</i>	
Scheme for improvement of Mathio cotton at Amreli	54
<i>Mysore State.—</i>	
Scheme for breeding Sea Island and Egyptian cottons in Mysore	55
<i>Studies of Pests & Diseases :—</i>	
Scheme for investigation of Small leaf diseases of cotton	56
Co-ordinated crop-weather scheme	56

CHAPTER V.

<i>Extension Work in Provinces and States</i>	58
<i>Bombay.—</i>	
(a) Jarila Seed Distribution and Extension Scheme	58
(b) Revised Jayawant and Gadag No. 1 Seed Distribution Scheme ..	59
(c) Scheme for cultivation of 1027 A.L.F. cotton in Nawapur Taluka ..	61

	PAGE
(d) Scheme for multiplication and distribution of 'Vijayz' cotton in Middle Gujerat	62
(e) Scheme for multiplication and distribution of Kalyan (K 72-2) cotton in Ahmedabad District	63
(f) Scheme for multiplication and distribution of 'Suyog' cotton in Surat tract (South of river Nerbudda)	63
<i>Central Provinces and Berar.—</i>	
Scheme for Distribution and Marketing of Jari'a cotton in Central Provinces and Berar	64
<i>Madras.—</i>	
(a) Scheme for maintenance of nucleus of pure seed of improved varieties of cotton in Madras Province	65
(b) Scheme for multiplication and distribution of C. 11-2 cotton in Coimbatore District of Madras Province	65
<i>Baroda State.—</i>	
(a) Scheme for creation of pure Wagad Zone in Mehsana District in Baroda State	66
(b) Scheme for distribution and multiplication of Vijaya cotton in Baroda State	66
(c) Scheme for distribution of Suyog cotton seed in Navsari District of Baroda State	67
<i>Mysore State.—</i>	
Scheme for multiplication and distribution of Selection 69 and M.A.V. in Mysore	67

CHAPTER VI.

<i>Progress in the Introduction of Improved Varieties of Cotton</i>	69-87
(i) Bombay Province	72
(ii) Madras Province	75
(iii) Central Provinces and Berar	79
(iv) East Punjab	80
(v) United Provinces	81
(vi) Hyderabad State	83
(vii) Baroda State	84
(viii) Rajpipla State	85
(ix) Mysore State	86

CHAPTER VII.

	PAGE
<i>Cotton Marketing, legislation and other protective measures</i>	88-92
(i) Cotton export policy	88
(ii) Exemption of cotton, cotton seed and cotton yarn from the Sales-tax	88
(iii) System of Survey and Appeal of East India Cotton Association ..	88
(iv) Revision of the Indian Cotton Contract	89
(v) Cotton baling hoops	89
(vi) Fuel requirements of ginning and pressing factories	89
(vii) Dismantling of cotton ginning and pressing factories	90
(viii) Regulated Cotton Markets	90
(ix) Agmarking	90
(x) Legislation to maintain the purity of cotton and other protective measures	90
(a) Cotton Transport Act	91
(b) Cotton Ginning and Pressing Factories Act	91
(c) Prevention of Introduction of Foreign Cotton Pests	91
(d) Cotton Control Act	92

 APPENDICES

I. Indian Cotton Cess (Amendment) Acts, 1947 & 1948	93-94
II. Members of the Indian Central Cotton Committee	96
III. Sub-Committees	98
IV. Statement of receipts and payments for the year ended 31st March, 1948, Balance Sheet as at 31st March, 1946 ..	100-104
V. Stocks of Indian cotton on 31st January 1948, held by the mills and the trade in Madras Province	119
VI. Indian raw cotton consumed in Indian mills	120

INDIAN CENTRAL COTTON COMMITTEE ANNUAL REPORT.

CHAPTER I.

GENERAL.

THE Indian Central Cotton Committee was established by the Government of India in 1921, in pursuance of the recommendations of the Indian Cotton Committee of 1917-18, and this is its twenty-seventh Annual Report covering the period 1st September, 1947, to 31st August, 1948. At first, the Committee was purely a technical advisory body to Government on matters connected with cotton. In 1923, however, it was incorporated under the Indian Cotton Cess Act and provided with separate funds to enable it to undertake work for the improvement of the growing, marketing and manufacture of Indian cotton. These funds are derived from the levy of a cess on all cottons consumed in mills in India or exported from Indian ports. For the first three years after the passing of the Act, the cess was collected at the rate of annas four on every bale of Indian cotton consumed in Indian mills or exported and, thereafter, at the rate of annas two. Subsequently, as a result of the war and the consequent decline in exports, receipts from the cess dropped considerably and it became necessary for the Committee to fall back on its accumulated funds in order to finance its activities. The income of the Committee was further reduced by the partition of the country on 15th August, 1947. Due to the constitution of Pakistan as an independent country, the cess on exports of cotton from Pakistan as also on cotton consumed in Pakistan mills was lost to the Committee. This loss of income was made up to some extent by grants given by the Government of India from the Cotton Fund built up from the proceeds of the levy of an additional duty of one anna per lb. on all imports of raw cotton. However, it was felt essential that the Committee should be assured of a more regular income to enable it to carry out its future work and policy effectively. Accordingly by two successive amendments (Appendix I) of the Indian Cotton Cess Act in 1947 and 1948, the cess was made leviable on all cotton consumed in Indian mills or exported from India with effect from 15th August, 1947, and the rate of the cess was raised from two annas per bale to four annas per bale

from 10th September, 1948. The idea from the very beginning was that the Indian Central Cotton Committee should form a common meeting ground for all sections of the cotton industry with the Agricultural Departments of all the cotton growing provinces in India, at which the cotton problems of the country would be discussed and measures suggested for tackling them. It was realised from the outset that the cultivator's interests must be paramount in all matters considered and decided on by the Committee and that no permanent developments could take place unless they were in his interests.

The first task of the Committee was to arrange for a well-directed co-ordinated effort for the improvement of every aspect of cotton in India, including the improvement of the race of the plant by scientific plant breeding. Grants were made to Departments of Agriculture in the various cotton growing Provinces and States for specific investigations on cotton, in which improvement of the variety was naturally given high priority. The policy in the main has been to supplement and not to supplant the work of the Provincial and State Departments of Agriculture, and though, as a matter of convenience, certain lines of demarcation have been laid down regarding the investigations which the Committee considers most appropriate for its grants, assistance, as a general rule, is given in the directions where it is most needed.

Under the Indian Cotton Cess Rules, members who are not *ex-officio* members, hold office for three years and one-third of their number retire each year in rotation. The term of office of additional members appointed by the Governor-General under Section 4 (x) of the Indian Cotton Cess Act is three years or such lesser period as may be specified in the notification appointing them. A list of members constituting the Committee indicating the various interests they represent, as on the 31st August, 1948, is given in Appendix II. The composition of the various Sub-Committees of the Committee as on the 31st August, 1948, is shown in Appendix III. The functions of these Sub-Committees have been detailed in earlier reports of the Committee.

Mr. C. J. Bocarro, Assistant Secretary of the Committee, continued to officiate as Secretary of the Committee upto the 17th August, 1948, when Shri Kalidas Sawhney, Director of Agriculture, Hyderabad State, who was appointed as Secretary of the Committee assumed charge of the office. Shri Ajodhya Sahai, Superintendent of the office, officiated as Assistant Secretary, up to the 17th August, 1948.

Shri D. L. Sen, officiating Director of the Technological Laboratory, was confirmed in that appointment retrospectively from the 17th February, 1947.

The total receipts of the Committee up to the 31st March, 1948, since its inception amounted to Rs. 2,32,09,668-4-1 of which Rs. 1,73,83,701-6-3 represent collections from the Cotton Cess and the remainder, miscellaneous receipts and special grants from the Government of India. The receipts during the year amounted to Rs. 6,30,718-12-2 and the total expenditure to Rs. 9,92,895-4-7. A statement of receipts and expenditure as well as the Balance Sheet for the year as at 31st March, 1948, is contained in Appendix IV.

Sardar Datar Singh (President), Shri R. G. Saraiya, (Vice-President), Shri Chunilal B. Mehta, Shri Madhaorao Deshpande, Shri Kalidas Sawhney, Shri V. Isvaran and the Secretary represented the Committee on the Board of Governors of the Institute of Plant Industry, Indore, during the financial year ending 31st March, 1948. During the same period, Sir Roger Thomas represented the Committee on the Indian Council of Agricultural Research. Under Article 51 of the Articles of Association of the East India Cotton Association, the Indian Central Cotton Committee is entitled to nominate from amongst its growers' representatives three persons, whether members of the Association or not, not having dealings in forward contracts, as Directors of the Association. Shri Madhaorao Deshpande, Shri F. B. Loxmeshwar and Raje J. R. Deshmukh were elected as the Committee's representatives on the Board of Directors of the Association for the cotton year 1947-48. On the termination of the appointment of Shri Madhaorao Deshpande as a member of the Committee his place on the Board of Directors of the East India Cotton Association was filled by Shri S. K. Wankhede.

Two meetings of the Indian Central Cotton Committee were held in the year under report at both of which Sardar Datar Singh, President of the Committee and Vice-Chairman of the Indian Council of Agricultural Research, presided. The first meeting was held at Bombay on the 21st and 22nd November, 1947. The most important subject considered at this meeting was the position, consequent on the partition of the country of the supply of cotton of the types required by mills in the Indian Dominion and the future policy to be followed in this connection. The subject was first examined by a special Sub-Committee which expressed the view that under the changed

conditions, it had become absolutely imperative that there should be a complete re-orientation of the cotton policy of the Committee and in pursuance of this view it suggested that in future the Committee should assume full responsibility for all cotton work which should be put on a sound and permanent basis. The only way of achieving this objective was, in its opinion, by the establishment of permanent cotton research stations in all the main cotton tracts of the country. The functions of these stations would be to carry out a survey of the areas for which they would be responsible, to see that only the most suitable cottons are produced in those tracts and to ensure a proper supply of pure seed. In addition to the main stations, it was suggested that there should be subsidiary stations as might be found necessary.

The Committee passed the following resolution on this subject :—

RESOLUTION :—

“ In view of the very satisfactory results obtained from the research work done by the Committee in the past, the Indian Central Cotton Committee feels that it is imperative now that further impetus should be given to such work. It is unanimously of the opinion that the research work done at present on Indian cotton is totally inadequate and strongly recommends to the Government of India that they give urgent consideration to the scheme put forward by the Indian Central Cotton Committee for the development of research work throughout thominione D of India.”

The question of surveys and appeals under the bye-laws of the East India Cotton Association was another subject which received the earnest consideration of the Committee at this meeting. In this connection the Committee recommended in replacement of the then existing system the appointment of paid surveyors of proved honesty and integrity not personally interested in the trade.

At the same meeting the Committee also passed a resolution recommending the free export of cotton to all permissible destinations up to the 31st March, 1948, and also the removal of the ceiling prices on cotton.

The second meeting was held in March, 1948. The most important subject that came up for discussion was the planned production of cotton for the year 1948-49 season. So a result of the partition of the country, the need for increasing the area under staple cotton in the Dominion of India had become imperative. On the basis of the figures for the year 1946-47, the annual consumption of cotton in mills in the Indian Dominion was estimated at 38.6 lakhs bales comprising Indian, Pakistan and other foreign cotton and extra-factory consumption at 2.7 lakhs bales

thus making a total of 41.3 lakhs bales. Against this figure, production in the Dominion of India was estimated at 26 lakhs bales only. Whilst this replacement of foreign (other than Pakistan) cotton by indigeneous cotton was not considered likely in the near future, it was felt that the present production of cotton would have to be raised by one third to attain the limited objective of making India independent of supplies of Pakistan cotton. The yield of cotton could be raised to some extent on the existing acreage by the greater use of manure and the extension of irrigation facilities, but in view of the overriding necessity of producing more food in the country, the application of these aids would for sometime at least be limited. The only alternative left, therefore, for increasing the production of cotton was the extension of the acreage under cotton. The Committee accordingly recommended an increase of 4 million acres under medium and long staple varieties in the various Provinces and States thus raising the annual cotton area of the country from 11 million to about 15 million acres. It also strongly urged that the Central Government should recommend to all Provincial Governments to see that all possible measures are adopted to increase the acre yield of cotton and to incur such expenditure as may be necessary for the purpose of well sinking projects and the supply of manures and fertilizers at subsidised rates.

CHAPTER II.

PARTITION AND THE COTTON PROBLEM IN INDIA

As this is the first report after the partition of the country on the 15th August, 1947, it would be appropriate here to describe briefly the effects of the partition on the cotton supply position. The total area under cotton in undivided India during 1946-47 was 15,038,000 acres, of which the tracts now constituting the Indian Union (including Hyderabad State) and Pakistan accounted for 11,671,000 and 3,367,000 acres, respectively. The total area under irrigated cotton in undivided India during that year was about 4,100,000 acres, of which Pakistan accounted for 3.3 million acres. In other words, as a result of the partition, slightly less than one fourth of the total area and over four fifths of the area under irrigated cotton in undivided India, have fallen to the share of Pakistan. On the basis of the cotton area in undivided India in the pre-war year 1938-39, however, Pakistan's share then amounted to 15% of the total cotton acreage and nearly two-thirds of the area under irrigated cotton. The relatively higher share of Pakistan in the acreage for 1946-47 is due almost wholly to the fact that whereas the Indian Dominion curtailed a great deal of its cotton area (particularly of short staple varieties) during the war, the Pakistan Provinces effected very little reduction.

The effect of partition on the cotton supply position in India is illustrated by the following table showing the production of cotton during 1946-47 in undivided India, Indian Union and Pakistan. The figures are based on the estimates of actual production arrived at from 'cotton pressed' and 'unpressed cotton consumed in mills':—

Staple lengths.	In lakhs of bales.			
	Undivided India.	Indian Union.	Pakistan.	
7/8" and above	{ Actual	9.9	4.5	5.4
	{ Per cent	23	17	34
Below 7/8" and above 11/16" {	Actual	20.9	13.0	7.9
	Per cent	50	50	49
11/16" and below	{ Actual	11.2	8.5	2.7
	{ Per cent	27	33	17
Total all staples	{ Actual	42.0	26.0	16.0
	{ Per cent	100	100	100

The data given above show that the Indian Union's share of undivided India's production of cotton of staple lengths '7/8" and above,' 'below 7/8" and above 11/16" ' and '11/16" and below,' formed 45, 62 and 76 per cent, respectively. As regards cotton of staple length 1" and above, it may be mentioned that the Indian Union's and Pakistan's production amounted to 1 and 2 lakhs bales, respectively.

While the Indian Union's share of the total crop of 42 lakhs bales of undivided India in 1946-47 was only 26.0 lakhs bales (62%), its mill consumption accounted for 38.6 lakhs bales (98% of the total mill consumption of undivided India amounting to 39.4 lakhs bales.) Details of the Indian Union's mill consumption of cotton classified by staple length are given below :—

Mill consumption of cotton in Indian Union in 1946-47.
(In lakhs of bales.)

Staple lengths.	Indian Union cotton.	Pakistan cotton.	Other foreign cotton.	Total all cotton.
7/8" and above	3.9	4.2	7.0	15.1
Below 7/8" and above 11/16"	12.5	5.6	..	18.1
11/16" and below	5.4	..	..	5.4
Total (all staples)	21.8	9.8	7.0	38.6

It will be observed from the figures given above that, at the level of consumption in 1946-47, the Indian Union was dependent on Pakistan cotton to the extent of 9.8 lakhs bales (4.2 lakhs bales of staple length 7/8" and above and 5.6 lakhs bales of staple length below 7/8" and above 11/16") and other foreign cotton to the extent of 7.0 lakhs bales (mostly 1" and above in staple).

The position regarding production and consumption of cotton in the Indian Union in 1947-48 was as under :—

	In lakhs of bales.			
	Long staple (7/8" and above.)	Medium staple (below 7/8" and above 11/16".)	Short staple (11/16" and below.)	Total.
Production in Indian Union	5.0	16.6	10.3	31.9
<i>Mill consumption :—</i>				
Indian Union cotton	5.0	18.4	5.7	29.1
Pakistan cotton	4.4	2.4	..	6.8
Other foreign cotton	6.2	..	..	6.2
	15.6	20.8	5.7	42.1
Extra-factory consumption .. .. .	..	0.4	2.3	2.7
Total (internal requirements)	15.6	21.2	8.0	44.8

It will be seen that as against the total production of 31.9 lakhs bales in 1947-48 (on an acreage of about 11 millions) the internal requirements (including extra-factory consumption) amounted to 44.8 lakhs bales, leaving a deficit of 12.9 lakhs bales. Out of the production, about 2.3 lakhs bales of short staple cotton were surplus to internal requirements and were exported. If allowance is made on this account, the real deficit is of the order of 15.2 lakhs bales. This deficit was met in 1947-48 by the use of 6.8 lakhs bales of Pakistan cotton (4.4 lakhs bales of long staple and 2.4 lakhs bales of medium staple), 2.2 lakhs bales of medium staple Indian Union cotton from the previous carryover which would otherwise have been imported from Pakistan and 6.2 lakhs bales of other foreign cotton of long staple.

As far as can be foreseen at present, the types of cotton imported from countries other than Pakistan are not likely to be grown in the country for some time to come. The import of 6 to 7 lakhs bales of these varieties will, therefore, have to be continued until as a result of research and experimental work now initiated in the Madras Province and Mysore State, suitable varieties of equally good cotton have been developed for cultivation in India. The dependence on Pakistan, however, can largely be avoided, as barring a very small quantity, Pakistan cotton can be replaced by increasing the production of similar varieties already in cultivation in the Indian Dominion.

In order to become independent of Pakistan, provision has to be made for an additional annual production of 4.4 lakhs bales of long staple and 4.6 lakhs bales of medium staple cotton. To achieve this object, the Indian Central Cotton Committee in March 1948 recommended to the Government of India, an over-all increase of 4.0 million acres in the area under medium and long staple cotton (as compared with the area in 1946-47, *viz.*, 11.7 million acres) distributed according to different varieties as under :—

Name of variety.	Staple length.	Proposed increase over 1946-47 (in lakhs of acres.)	Estimated increase in production (in lakhs of bales.)
Cambodias Co.2, Co.3 and Co.4	1" and above ..	1.0	0.40
Surti-Suyog	7/8" to 31/32 " ..	3.0	0.68
Cambodias		1.5	0.75
Kumpta Jayawant		7.0	1.10
Buri (including Cambodia)		2.5	0.46
Hyderabad Gaorani	13/16" to 27/32".	4.0	0.63
Hyderabad American		0.5	0.08
Broach Vijaya		3.0	0.58
Westerns and Northerns	Below 13/16" and above 11/16".	2.0	0.27
Karunganni		0.5	0.12
Jarila, Verum or H.420		12.0	2.53
Dholleras	Below 13/16" and above 11/16".	3.0	0.50
	Total ..	40.0	8.10

No final decision has so far been taken by the Government of India on the above recommendation. The effect that such increase in cotton acreage might have on the position of food crops is still under examination.

CHAPTER III.

COTTON STATISTICS.

THE year under review was the first complete cotton year after the partition of the country. The area under cotton during the year was estimated at 10,932,000 acres for the Indian Union (including Hyderabad State) against 11,671,000 acres in the previous year and 20,972,000 acres on the average of the three years ending 1938-39. The decrease in area occurred despite the instructions issued by the Government of India to the Provinces and States early in 1947-48 for relaxing the measures for reducing the area under cotton with a view to ensuring that a part of the land diverted from cotton to food was reverted to cotton. One of the causes of the low acreage under cotton was the comparatively better prices obtained for food crops and other competing non-food crops. The decrease was mainly in the Provinces of Bombay, Central Provinces and Berar, Madras, East Punjab and the United Provinces and the States of Hyderabad and Baroda. The total estimated production for the Indian Union was 2,116,000 bales of 400 lbs. net against 2,125,000 bales (revised) in the previous year.

INDIAN COTTON SITUATION, 1947-48.

The season opened with the September Contract of the previous season at the floor level, *viz.*, Rs. 430. During the month of September 1947, no official business was reported in the September Contract which remained grounded at the floor, except for a temporary rise. The Government of India announced a new schedule of prices for the 1947-48 season effective from the 1st September, 1947. The important changes brought about were (i) the creation of a new class for basic staple 5/8" to cover all varieties of *desi* cotton, (ii) the separate classification of *Vijaya* and other allied cottons, (iii) the slight enhancement in the ceiling prices of *desi* cotton and (iv) the removal of price control on Sind *desi* cotton. Free exports of cotton were permitted up to the 30th November. The Government of Bombay, who were not agreeable to make any change in the structure of the then existing Indian Cotton Contract as proposed by the trade, permitted trading in the new crop contracts on the basis of the existing contract, subject to the condition that any revised system of survey arbitration and appeal, which might be approved by Government, should apply from the date of its introduction to contracts

entered into for the season 1947-48 and thereafter. Trading in new crop contracts started on the 6th September with the January contract opening at Rs. 456-8. After a small rise, there was a setback in prices owing to the deterioration in the communal situation in the northern part of the country. The middle of September witnessed an upspring in prices on account of encouraging spot demand and the possibility of the Sind and Punjab crops being lower than expected. The highest price during the month was reached on the 30th September. The prices in October continued to be fairly steady, the lowest and highest prices during the month for the January contract being Rs. 457 and Rs. 474, respectively. The market generally continued its upward trend in the following month, despite the uncertainty at the time regarding the accession of the Hyderabad State to the Indian Union. The market received with relief the announcement made towards the end of November about the conclusion of a standstill agreement for one year between the Government of India and the Nizam's Government. Two other important developments during the month were (i) the announcement of the Government's standardisation scheme to augment cloth production in the country and (ii) the Government of India's orders prohibiting the export of cotton of staple length 13/16" and above to all countries including Pakistan until it was known that the supply of long staple cotton grown in Pakistan would be normal during 1947-48, the export of short and medium staple cotton being allowed free, subject to the position being reviewed in March.

During the month of December, the market ruled very firm, especially the January contract, mainly on account of persistent rumours of early decontrol of cotton and textiles and the reported concentration of a large bloc of January future contracts in a few hands in the face of a difficult transport situation rendering large tenders improbable. The average price of the January contract stood at Rs. 494 during that month. The firm and active conditions continued during the month of January. Improved spot demand, paucity of better qualities and fears of a smaller crop owing to the unusual cold wave over the cotton tracts, imparted strength to the market. The January contract reached the ceiling of Rs. 530 on 15th January, while the March contract was quoted at a discount of Rs. 11-4. After a small reaction, all deliveries except March ruled at the ceiling rates. Following the Government of India's announcement on the decontrol of cloth and the removal of floor and ceiling prices of cotton the extension of the export ban to all varieties of Indian cotton with the exception of Bengal *desi*, Oomra *desi* (excluding

C. P. I and C. P. II), Mathia and Comillas and the doubling of the export duty on cotton from Rs. 20 to Rs. 40 per bale, the market reacted sharply on the 20th January. The nervous feeling was, however, short-lived. The news that the Pakistan Government had also decided to double the export duty on raw cotton and also to restrict the exports of cotton to foreign countries including the Indian Union, took the price of the March contract to Rs. 541-8 on the 24th January. The price level, however, began to slip down gradually due to various factors including reports regarding negotiations between India and Pakistan for cotton supplies against cloth. On the 31st January, the market remained closed on account of the tragic death of Mahatma Gandhi, the Father of the Nation.

During the month of February, the market ruled very firm due to the strong statistical position of Indian cotton, the rapid advance of Egyptian cotton prices, the paucity of arrivals from up-country and the scarcity of desirable varieties. The Pakistan Government's announcement on the 22nd February regarding the removal of floor and ceiling prices fixed for Pakistan cotton and the further enhancement of the export duty from Rs. 40 to Rs. 60 per bale had a bullish effect on the Bombay cotton market. After a voluntary suspension of business for nearly 13 days as a protest against the levy of stamp duty on all futures cotton transactions, the Bombay cotton market re-opened on the 10th March when the Indian Cotton Contract, March delivery, was quoted at Rs. 581. The announcement of the Indo-Pakistan agreement for exchange of Indian cloth against Pakistan cotton on the basis of 12 bales of cloth for every 20 bales of Pakistan cotton up to the 31st August, 1948, was interpreted bearishly in the first instance. The trade soon realised that Pakistan cotton would have to bear the export duty of Rs. 60 per bale and the Indian import duty, while Pakistan had no large quantities of desirable varieties to offer to India. The delay in the arrivals of cotton from up-country, better advices from the ready market coupled with the failure of the Indo-Sudanese talks for the purchase of Sudan cotton, all contributed to push up prices. This position continued up to the middle of March. Thereafter the Finance Minister's statement about the Central Government's proposed legislation to curb speculation brought about a sharp reaction in prices on the 18th March. Again, except for occasional setbacks the upward trend was resumed owing to the rising prices of Egyptians and the growing feeling that Pakistan would not be able to meet her commitments to India. The March contract eventually matured at Rs. 612. At the end of March,

the May contract closed around Rs. 623. The average price during March for the nearest delivery month was Rs. 593.

In April, the market remained very firm and prices touched a record high level in the existence of the Indian Cotton Contract. On the 3rd April, the Government of India announced the continuance of the restrictions on export. By the 9th April, there was an all-round spurt in prices, owing to the encouraging announcement of the Government of India's industrial policy, the higher cotton consumption by mills, the Government's intention to lift the existing control of cloth and yarn and the uncertainty of cotton imports from abroad. The bullish fervour was, however, checked on reports of a requisition made to the East India Cotton Association demanding the declaration of a "squeeze" and the reported exemption from the import duty granted by the Government of India to Pakistan cotton. Prices moved for sometime in a seesaw manner. After the result of the poll at the General Meeting of the East India Cotton Association declaring the existence of a squeeze, the market again firmed up on reports that a further representation would be made to nullify the declared emergency and of the total decontrol of cloth. The May contract rose to Rs. 726 on the 23rd April. With the gradual shifting of interest from May to July position, the price of the May contract declined to Rs. 698 on the 30th April. After erratic fluctuations, the market took an upward course again from the 10th May, following the resolution passed by the East India Cotton Association declaring the state of emergency to be at an end. The prospects of exports of cotton to Japan, consequent on the arrival of the SCAP Trade Mission in India, added to the bullish fervour. The result was that May and July contracts spurted up to the peak levels of Rs. 770 and Rs. 789, respectively, on the 13th May. Prices thereafter declined notwithstanding bullish factors such as the announcement of the Government of India to allow, as a special case, the exports to Japan of 55,000 bales of raw cotton, including the prohibited varieties C.P.1 and C.P.2 and Jarila and the active spot demand for desirable growths. Reports about the decline in Egyptian cotton prices and the possibility of drastic Government measures to bring down the prices of cloth encouraged the sagging tendency, with occasional rallies. The reported purchases of sizable quantities of cotton by the SCAP Trade Mission imparted firmness to the price level. Subsequently, however, the news about the conclusion

of an agreement between the Pakistan and Indian Dominions in respect of essential commodities including cotton and cloth and rumours about the impending imposition of textile control, depressed sentiment with the result that the July contract slipped to Rs. 714 on the 31st May.

The dominant factors which influenced cotton prices in June, apart from expectations of a larger crop during 1948-49, were the prospects of imports of foreign cotton from Egypt, Brazil and the U.S.A., as well as of imports of 650,000 bales from Pakistan according to the Indo-Pakistan Trade Agreement. The highest and lowest prices of the July contract during June were Rs. 732 and Rs. 643, respectively. The delayed monsoon in several cotton growing tracts, encouraging mill consumption, the reported failure of the Indian cotton delegation's mission to Egypt and the Indo-Hyderabad developments were the main factors which contributed to firm prices early in July. Thereafter press reports of a likely re-imposition of cloth control combined with switching over of commitments from July to September contract, depressed the quotation for July delivery. This was followed by an upward trend in prices until July delivery matured at Rs. 680 on the 25th July. After a short spell of erratic fluctuations, the Government of India's announcement regarding the imposition of textile control, the freezing of mill stocks of cloth and the proposal to control cotton prices unnerved the market and prices precipitately slumped and closed at Rs. 593 on the 31st July. During the month of August, the market ruled easy in the beginning and slumped on Government's announcement of the floor and ceiling prices for Jarila basic cotton tenderable against the Indian Cotton Contract. The floor price of Jarila (Fine) cotton 25/32" staple was fixed at Rs. 495 and the ceiling price at Rs. 620 per candy of 784 lbs. net which corresponded to a ceiling price of Rs. 600 for Jarila (Fine) 3/4" staple. The uncertainty as to whether the current crop was covered by the control order and reports of a bumper crop in the U.S.A., resulted in lack of confidence in prices. In the meantime, the Government of India announced that imports of raw cotton stapling 7/8" and above from sterling areas including Brazil but excluding East Africa and Sudan would be licensed freely for the half year, provided imports were made against actual sales to mills. As the floor and ceiling prices of varieties other than Jarila had not been fixed, prices were not sustained. The market closed on the 31st August with the September contract quoting at around Rs. 506.

The statistical position of cotton in the Indian Union during 1947-48 was as under :—

Indian Union & Pakistan cottons. (In lakhs of bales.)

	(In lakhs of bales.)			
	7/8" and above.	Below 7/8" and above 11/16".	11/16" and below.	Total.
Estimated carryover on 1-9-1947				
{ (a) With mills ..	4.8	8.0	2.2	15.0
{ (b) With trade ..	3.0	13.0	7.0	23.0
	7.8	21.0	9.2	38.0
Estimated actual crop of Indian Union in 1947-48.	5.0	16.6	10.3	31.9
Estimated receipts from Pakistan ..	1.8	1.5	..	3.3
Total supply ..	14.6	39.1	19.5	73.2
Mill consumption in Indian Union. {				
Indian Union cotton ..	5.0	18.4	5.7	29.1
Pakistan cotton..	4.4	2.4	..	6.8
Total ..	9.4	20.8	5.7	35.9
Extra-factory consumption .. ..	..	0.4	2.3	2.7
Exports .. .. .	..	4.5	5.0	9.5
Total offtake ..	9.4	25.7	13.0	48.1
Estimated carryover with mills and trade on 31-8-1948	5.2	13.4	6.5	25.1
Carryover with mills on 31-8-1948 ..	3.5	7.9	2.4	13.8
Estimated carryover with trade on 31-8-1948	1.7	5.5	4.1	11.3

STAPLE LENGTH OF INDIAN COTTON.

The need for revising the staple length classification adopted in the Committee's report on the staple length of the Indian cotton crop of each season published in its Statistical Leaflet No. 1 was felt for some time in view of the marked changes that had taken place in the character of the crop since the classification was last revised in 1936. Further, until recently there was

no uniform definition of the terms 'long,' 'medium' and 'short' staple cottons as used by the various Departments of the Government of India and the Indian Central Cotton Committee. For instance, according to the definition then adopted by the Committee, these three terms covered cottons 'over 1", '7/8" to 1" and 'below 7/8", respectively, whereas the Export Trade Controller, Bombay, and the Textile Commissioner, Bombay, defined long, medium and short staple cottons as '13/16" and above,' 'below 13/16" and above 11/16"' and '11/16" and below,' respectively. The question of revising the staple length details given in the Committee's Leaflet referred to above and the desirability of suggesting a uniform definition of the terms long, medium and short staple were accordingly referred to a Special Sub-Committee consisting of representatives of the Indian Central Cotton Committee, the East India Cotton Association, the Bombay Millowners' Association and the Southern India Millowners' Association. The Sub-Committee met in February 1948 and while recommending certain modifications in the grouping of some of the varieties and in their agricultural and technological details, suggested the following classification by staple length groups for adoption by the Committee, the Textile Commissioner and the Export Trade Controller, Bombay, in future :—

- | | | | |
|---------------------------|----|----|--------------------------------|
| 1. Superior long staple | .. | .. | 1" and above. |
| 2. Long staple | .. | .. | 7/8" to 31/32". |
| 3. Superior medium staple | .. | .. | 13/16" and 27/32". |
| 4. Medium staple | .. | .. | Below 13/16" and above 11/16". |
| 5. Short staple | .. | .. | 11/16" and below. |

With a view to assigning the different varieties to their proper staple length group under the revised classification, the following varieties included under the old staple length group '7/8" and above' have now been relegated to the group 'below 7/8"':—

- (1) Punjab L. S. S.
- (2) Karunganni strains.
- (3) White and Red Northerns.
- (4) Kumpta ordinary.
- (5) Westerns Farm (Hagari-I)
- (6) Mysore American—M.A. II.
- (7) Dharwar-American (Gadag 1).
- (8) Broach-Vijaya.

- (9) Hyderabad American.
- (10) Jarila.
- (11) C. P. Berar Verum.
- (12) Perso-American.
- (13) Tinnevellies other than Karungannies.
- (14) Punjab American 4F.

The above recommendations were approved by the Committee. The classification suggested has also since been accepted by the Export Trade Controller and the Textile Commissioner, Bombay.

The above classification together with the modified fibre particulars of the varieties included in each group as recommended by the Special Sub-Committee & approved by the full Committee has been given effect to in Statistical Leaflet No. 1 for 1946-47, issued during the year under review.

According to the official forecast, the cotton crop of the Indian Union (including Hyderabad State) during 1946-47 was estimated at 2,112,000 bales of 400 lbs. net. The proportion of the crop falling under each of the five staple length groups referred to above to the total formed 5, 15, 28, 21 and 31 per cent, respectively.

STATISTICS OF STOCKS OF COTTON HELD IN THE COUNTRY.

The statistics of stocks of cotton held by the mills on the 31st August each year are collected by the Committee from mills by direct enquiries on a voluntary basis. The figures of stocks held by the trade on the same date are obtained through the co-operation of Provincial and State Governments and trade bodies. To make the statistics of trade stocks as complete as possible, the Committee recommended, in 1944, to the Provincial Governments and States the introduction of legislation for the purpose. The Governments of Bombay, the Central Provinces and Berar, the United Provinces, the East Punjab and Baroda and Gwalior States have passed the required legislation. The Government of Madras propose to take similar action. Pending the introduction of legislation, the United States of Saurashtra and the Patiala and the East Punjab States Union have undertaken to collect the required data on a voluntary basis with effect from the 31st August, 1948. Good progress has thus been made in extending the area of the census and it is hoped that before long more comprehensive and reliable statistics of stocks would be available.

As the cotton crop season of the Madras Province is taken as the year ending 31st January, figures of stocks of cotton held in the province on this date are collected annually in addition to the figures relating to the 31st August. The relevant figures for the 31st January, 1948, together with comparative details for previous years, are given in Appendix V.

DEMAND FOR VARIOUS TYPES OF INDIAN COTTON.

Statistics relating to internal and export demand for the various types of Indian cotton are compiled from the information collected on a voluntary basis and are published in Statistical Leaflets Nos. 3 and 4. Such statistics are of great value to the trade and the industry and to those entrusted with the responsibility of shaping and directing the cotton policy of the country. The statistics relating to mill receipts and exports of cotton classified by varieties for the 1946-47 season were published during the year under review. During that season, mills in the Indian Union received 3,611,000 bales of all growths of cotton of which the shares of Indian Union, Pakistan and other foreign cottons were 55, 25 and 20 per cent, respectively. Out of the total exports of 882,000 bales from the Indian Union and Pakistan during 1946-47, the Indian Union alone accounted for 419,000 bales or 48% of the total.

INDIAN MILL CONSUMPTION.

Figures of consumption of Indian cotton in mills in Provinces and Indian States for the years 1933-34 to 1947-48 based on the monthly statements issued by the Committee are given in Appendix VI. From the 15th August, 1947, owing to the constitutional changes, the figures of consumption of cotton by mills in Pakistan are excluded and the consumption figures from that date refer only to the Dominion of India, including Indian States. By virtue of the Indian Cotton Cess (Amendment) Act, 1947, and consequent amendments made in the Indian Cotton Cess Rules, mills are required to furnish their figures for consumption of cotton under the three heads (i) Indian cotton, (ii) Pakistan cotton and (iii) other foreign cotton. It is proposed to publish the cotton consumption statistics under the three heads from September 1948. The total consumption of Indian and Pakistan cottons in 1947-48 amounted to 3,573,000 bales, being 425,000 bales higher than in 1946-47. The figures compiled by the Textile Commissioner, Bombay, indicate that consumption of Indian Union, Pakistan and other foreign cottons in 1947-48 was 29.1, 6.8 and 6.2 lakhs bales against 21.9, 9.8 and 7.0 lakhs bales, res-

pectively, in 1946-47. This noteworthy increase in the consumption of Indian cotton may be ascribed, apart from the price factor in its favour, to the difficulties of obtaining supplies of Pakistan cotton and the fortuitous increase of about six lakhs bales in the Indian Union's crop in 1947-48 as compared with 1946-47.

EXPORTS.

Exports of Indian cotton from the Indian Union during the season are estimated at 951,000 bales, against 1,005,000 for undivided India bales in 1946-47. Exports to the United Kingdom, the Continent, U.S.A., and other countries formed 8, 38, 6 and 48 per cent of the total exports during 1947-48, the corresponding percentages for 1946-47 being 19, 39, 11 and 31, respectively.

STATISTICS OF COTTON PRESSED.

During the season under review, 1,665,000 bales of cotton were pressed in the Provinces of the Indian Union and 1,029,000 bales in Indian States, making a total of 2,694,000 bales for all-India; the corresponding figures for 1946-47 were 1,234,000, 990,000 and 2,224,000 bales, respectively.

UNPRESSED (LOOSE) COTTON STATISTICS.

The statistics of cotton pressed do not account for the whole of the Indian cotton crop as, apart from the quantity utilised for extra-factory consumption, chiefly in the form of hand ginned cotton, mills situated near cotton growing areas often use considerable quantities of ginned, unpressed cotton. During the year, unpressed cotton equal to 220,000 bales was consumed in mills in the Indian Union against the same quantity in the preceding year. The relevant figures for the years 1933-34 to 1947-48 are given in Appendix VI to this report.

STATISTICS OF COTTON GINNED.

The figures of cotton pressed do not cover the entire crop, as, apart from unpressed lint consumed in spinning mills, for which figures are available, unpressed lint is also utilised for domestic purposes, such as hand-spinning, making of quilts, mattresses, etc., for which there are no reliable data. If ginning returns were instituted, all that would be required for arriving at the actual crop is a reliable estimate of the quantity of hand ginned cotton used for domestic purposes. The ginning and pressing returns would, at the same time, serve as a check on each other. The submission of ginning returns

is now in force in the Central Provinces and Berar, Bombay Province, West Bengal, the United Provinces, Madras Province, East Punjab and Ajmer-Merwara and certain Indian States.

IMPROVEMENT OF COTTON FORECASTS.

The examination of the accuracy of the cotton forecasts of the 1946-47 season has been held up owing to complete information relating to the rail and river-borne trade in cotton for that season not being available. The results of the post-mortem examination of the cotton forecasts of the five seasons ending 1945-46 were published during the year under report in Statistical Leaflet No. 5 entitled "Report on the accuracy of the all-India cotton forecasts of the five seasons ending 1945-46." It has been found that on the average of the five seasons in question, the cotton forecasts of undivided India were underestimated by 15% of the actual.

SUPPLY OF MONTHLY REPORTS ON INDIAN COTTON TO THE INTERNATIONAL COTTON ADVISORY COMMITTEE.

During the year under review, the Committee's office was entrusted by the Government of India with the work of supplying monthly reports on Indian cotton to the International Cotton Advisory Committee, Washington. Accordingly, the required information is being supplied from December 1947.

SCHEME FOR CROP ESTIMATING SURVEY ON COTTON IN THE CENTRAL PROVINCES AND BERAR.

The object of the scheme is to provide a suitable technique for conducting yield surveys on cotton which are considered to constitute the most reliable direct basis for estimation of the outturn of the crop. The scheme was originally sanctioned in July 1942 for a period of one year. It came into operation on the 15th October, 1942, the venue of the experiment being the Akola district. At its meeting in July 1943, the Committee agreed to extend the scheme to Buldana district for a period of one year. In July 1944, the scheme was extended to the whole cotton tract of the Province for a period of one year in the first instance, the object being to determine accurately the average yield of *kapas* per acre and the total production for the whole of the cotton area in the Province by the method of harvesting random plots. At the same time, it was intended to train the staff of the Land Records and Revenue Departments in the practical working of the method so that the work could ultimately be taken over by these Departments as a routine procedure for carrying out yield surveys.

In July 1945, the Committee approved of a further extension of the scheme for a period of one year. The practicability of the random sampling technique and the trustworthiness of the results obtained having been fully demonstrated by the first three years' work, it was considered necessary to take the experiment to the final stage in which the field work would be organised in such a manner that it could be entrusted completely to the staff of the Revenue and Land Records Departments primarily responsible for the yield survey work in the Province. In August 1946, the scheme was extended for a further period of two years, *viz.*, 1946-47 and 1947-48 (up to 31st March, 1948), the expenditure to be shared between the Committee and the Provincial Government on a 50:50 basis, subject to the condition that at the end of that period the Provincial Government would take up crop estimating survey as an annual routine at their own cost.

The survey in 1947-48 was the fourth provincial survey carried out for estimating the average yield per acre and the total production for the Province by the random sampling technique. The survey was conducted on the lines of the previous year except that 8 more villages were sampled in the Nagpur district with a view to increasing the accuracy of the yield estimates of that district.

According to the survey, the total production of lint for 1947-48 calculated on the basis of actual acreage and the actual ginning outturn based on information obtained from principal cotton ginning factories was estimated at 550,940 bales for the whole province, with a standard error of 13,108 bales. The average yield of *kapas* per acre for the province was estimated at 220.7 lbs. with a standard error of 5.3 lbs. or 2.4%, the average yield in Berar being 25.6 lbs. (or 12.7%) higher than that in the Central Provinces.

As in the previous year, the survey was utilised to supply timely estimates for the third, fourth and final forecasts of yield this year also. As compared with the actual yields obtained under the survey, the yield was underestimated both in Berar and the Central Provinces in the third forecast based on anna valuation of survey plots in November. The fourth forecast which is made when the crop is harvested agreed very closely with the actual yield all over the Province except for Amraoti district where a few bolls matured late in the season but their produce was not harvested because of the high cost of picking. The final forecast was identical with the actual yield.

Provisional figures for district standard outturns calculated from the results of the survey indicate that the present official district figures are pitched at a very high level. It is proposed that as from 1948-49 these figures should be replaced by quinquennial average of mean district yields based on survey results when the provincial survey will have completed 5 years.

The survey was conducted under the technical and administrative control of the staff of the Land Records Department. As it is to become a part of the normal duty of that Department, it has been recommended that these experiments should be included in the curriculum of the Patwaris' and Revenue Inspectors' examinations.

PUBLICATIONS.

The following statistical publications were issued during the year under review :—

- (1) Statistical Leaflet No. 1—Fourteenth Issue (1946-47) Report on the staple length of the Indian cotton crop of 1946-47 season.
 - (2) Statistical Leaflet No. 3—Fourteenth Issue (1946-47) Receipts at mills in India of raw cotton classified by varieties, 1946-47.
 - (3) Statistical Leaflet No. 4—Fourteenth Issue (1946-47) Exports by sea of Indian raw cotton classified by varieties, 1946-47 season.
 - (4) Statistical Leaflet No. 5—Seventh Issue (1941-46), Report on the accuracy of the all-India cotton forecasts of the five seasons ending 1945-46.
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CHAPTER IV.

RESEARCH.

Most of the research schemes of the Committee are concerned with the improvement of the race of the plant, the object being to enable the grower to secure the greatest profit. To do this there have to be taken into account the yield per unit area and the quality of the lint, on which demand and price depend. A number of research schemes, among which the most important are those for cotton breeding for the improvement of quality, are in operation in the various cotton growing Provinces and States. The majority of these schemes are financed entirely by the Committee, while the cost of others is borne partly by the Committee and partly by the Provincial or State Governments concerned. The Committee also makes grants to Departments of Agriculture in the various cotton growing Provinces and States for specific investigations on cotton, not necessarily confined to the breeding of new varieties, the aim being to arrange for a well-directed co-ordinated effort for the improvement of every aspect of cotton in India. Since January, 1943, the expenditure on new schemes and extensions of old schemes sanctioned by the Committee, which are for the benefit of cotton growers, is being met from the Cotton Fund at the disposal of the Government of India. Research on cotton technology is carried on at the Committee's Technological Laboratory and in addition trained Technological Assistants are posted at the Cotton Research Stations at Surat, Dharwar, Coimbatore, Indore and Nanded to help the botanists in charge in their work of breeding improved varieties of cotton.

COTTON TECHNOLOGY.

The research and testing work was maintained at the level attained in the past. Valuable assistance was rendered to Cotton Breeders, cotton trade and textile industry by carrying out tests for them and giving them technical information and advice. The area under improved varieties, mainly of medium and long staple types, brought about with the help of the tests at the Laboratory by the Indian Central Cotton Committee in collaboration with the Provincial and State Departments of Agriculture, was 56 per cent of the total cotton area. The total number of samples received for tests of all kinds was 1248 in the year and 259 reports were issued on them.

A new micro-spinning technique suitable for Indian cottons was evolved by which it is possible to spin and estimate with reasonable accuracy the spinning quality of so small a quantity of lint as 2 oz. Thus, the produce of even a few plants would be enough for a spinning test which would prove of immense help in the selection of improved strains at a very early stage.

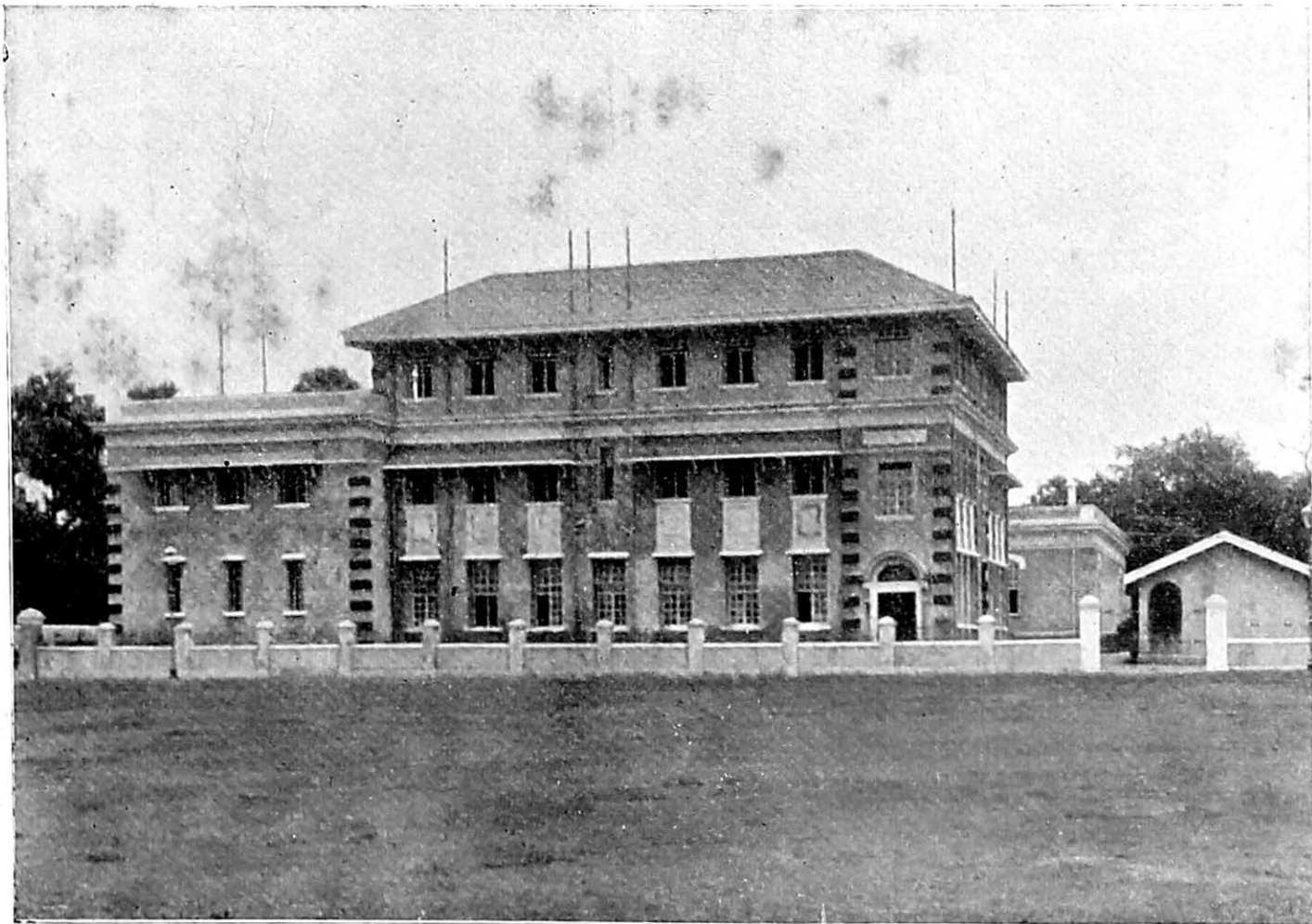
A ginning technique for small samples was standardised and recommended for use by all Cotton Breeding Stations. A balance of the cement balance type was designed for rapid and direct determination of ginning percentage of cotton for use by the Cotton Breeders. A small gin of the Macarthy type that could be used for small samples of *kapas* (seed cotton) was devised for use in Cotton breeding work. A modified type of Bardoli gin in which seed-crushing is practically eliminated and an instrument to measure the strength of attachment of fibres to cotton-seed were also designed.

Experiments on *kapas* samples were made with a view to ascertain the relative efficiency of the pre-cleaning machines and to evolve technique of cleaning *kapas* to obtain better quality lint. The cause of difference between the spinning performance of saw-ginned and roller-ginned samples of the same cotton were investigated. Comparative ginning tests at upcountry ginning factories and at the Laboratory were completed on two varieties of cotton.

A suitable standard technique for halo-length determination is being evolved for adoption at all breeding stations.

Tests carried out on agricultural samples included tests on certified Vijay grown at different centres in middle Gujarat and Baroda State, comparative tests on hybrids to replace Jarila, tests on Gaorani 6 of different generations and produced with different doses of manure, comparative tests on Jawahir and Jayawant on the one hand and Subhas and Gadag 1 on the other, tests on district trials of Suyog and Type 1-4, tests on long staple types bred at Coimbatore and Avanashi, tests on *desi* and American varieties grown in the United Provinces, tests for the effect of exposure of cotton-seeds to X-ray tests on Narma Cotton, tests on bast fibres as substitute for jute, tests on long staple hybrids grown in Surat and Sea Island Cotton grown in North Canara.

Spinning tests were made, as usual, on representative standard and trade varieties of Indian cottons, the results for which were published for general information of the trade and the industry in technological bulletins and circulars.



The Technological Laboratory, Matunga, Bombay.



Tests on 391 samples of various textile fibres, yarns and cloths as compared with 279 last year, were made in the Testing House of the Laboratory on behalf of firms and mills. These included 12 samples of cloth sent by a firm to ascertain whether they were hand-spun and hand-woven, 14 samples of belting by the Indian Tariff Board for analysis and 13 samples of surgical catguts for report on quality. The total number of samples tested in the Testing House alone amounted to about 5,600 in the past 12 years.

Good progress was recorded in technological investigations, some of which were of a fundamental nature while others were of direct practical value to the trade and the industry. Causes leading to neppiness in Indian cotton yarns are being investigated in detail. Causes of abnormal spinning performance of certain Indian cottons having longer staple but spinning lower were investigated. Formulae were developed to estimate the spinning value of different botanical varieties which were more precise than those derived for them from Technological classification previously. The influence of different lengthgroups of fibres in yarn strength is being studied. Indian trade bales of Cambodia Co.2, Jarila and P. A. 124F were stored in upcountry centres and in Bombay in order to study the effect on the quality of lint. It was found that all these three varieties had maintained their yarn-strengths even after a year's storage. Plain cloths are being manufactured in the Victoria Jubilee Technical Institute from the carded and combed yarns prepared from Sind M4 and Sultani (199F) cottons with a view to compare them with the cloths prepared from carded Kampala yarns. Tests on medium staple Indian cottons regarding their suitability to manufacture hosiery yarns were made. Optimum conditions for partial acetylation of cotton fibres with a view to render them highly resistant to mildewing, rotting and other attacks from micro-organisms are being worked out. In addition, several batches of chemical cotton were prepared from linters by the method specially evolved at the Laboratory. Many lengths of cellulose sheets had been produced by the viscose method and efforts are being made to make them fully transparent.

In addition to the above investigations, work is in progress on the spinning quality of mixings of Indian cottons with special reference to their fibre-properties, on the effect of agronomical factors on the physical properties of the cotton fibre and on the use of Air Permeability apparatus for determining the fineness of cotton. The work of the scheme on the survey of cellulose bearing materials in India financed by the Council of Scientific and Industrial

Research was continued and a paper on the investigations on some promising cellulose bearing materials (other than cotton) for the manufacture of rayon was sent for publication.

FUNDAMENTAL RESEARCH WORK ON COTTON.

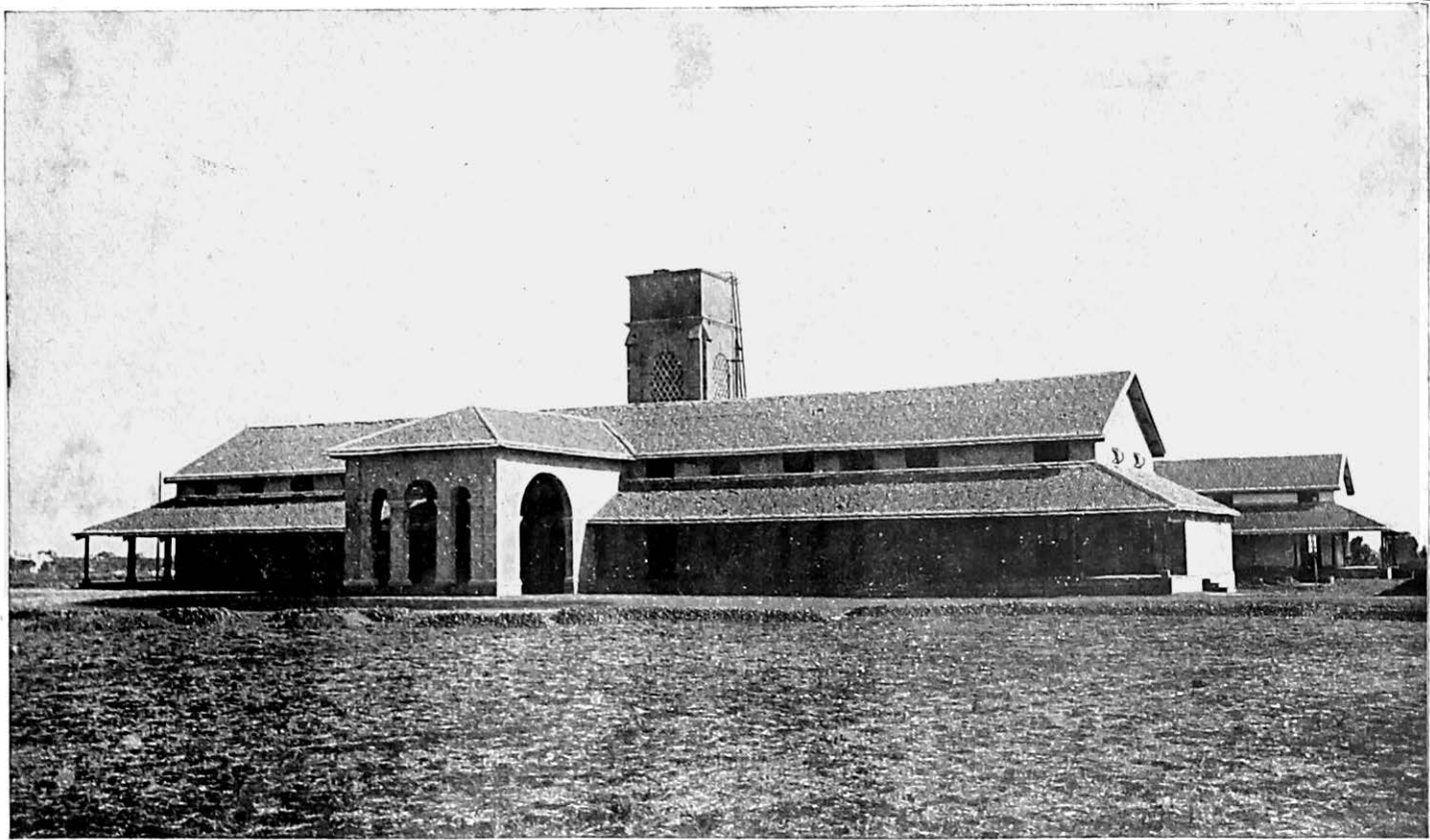
1. Genetics.

(i) **Chlorophyll deficiencies.**—F₂ grown during the season from the crosses of normal plants with chlorophyll deficient ones observed during 1946-47 showed a simple monogenic segregation, normal greenness being fully dominant. Further, this gene for chlorophyll deficiency was found to be linked with R₂ locus giving only 10% cross-overs. It, therefore, appears to be identical with the gene observed by Yu (J. of Genetics, 1940) and represents another case of recurrent mutation.

Extensive observations carried out during the past two seasons with regard to the occurrence of the yellow tissue (variegation) show that this may occur at any time or on any part of the plant belonging to any species of the cultivated Asiatic cottons although with varying frequencies. Heritable nature of variegations is doubtful.

(ii) **Lintlessness.**—During the season, work on the lintless genes in Asiatic cottons was commenced with the object of extracting the different lint quantity genes present in various standard strains of Indian cottons in order to study their genetics and a number of crosses were accordingly made during the season.

(iii) **Fuzz colour.**—It is known that a commercial sample of seed of Buri 107 is usually a mixture of green and white seeds and it was decided to explore the possibility of evolving substrains of Buri 107 of uniform fuzz colour and also to study the relationship, if any, between the fuzz colour and economic characters. A fresh sample of Buri 107 was obtained from the Economic Botanist, C.P., and as usual it consisted of a mixture of white and green seeds. There were, however, a number of intergrades which it was difficult to classify. The sample was, therefore, divided into two extreme classes, *viz.*, green and white, and 120 seeds of each class were sown. In the green seed group 36 plants were obtained of which 32 produced exclusively white seed, three produced green seeds and one produced seed of intermediate fuzz colour. In the white seeded class 54 plants were obtained, all of



The Institute of Plant Industry, Indoro.

which produced white seed. This indicates that in most cases the green colour of fuzz may be due to non-genetic causes

(iv) Interspecific hybridisation.—It was pointed out in the last year's report that work had been in progress at Indore to introduce the drought and disease-resistance of the American wild species, viz., *G. thurberi* and *G. raimondi* in the cultivated cottons. These two species were crossed to *G. arboreum* and *G. hirsutum* respectively and the hybrids doubled by colchicine. These doubled hybrids and their progenies were, back-crossed to either *G. hirsutum* or to *G. hirsutum* and *G. barbadense* in order to restore fertility. Last year 680 and 10 fertile plants were obtained from *thurberi* and *raimondi* crosses respectively. During the year under report, progenies were grown from these plants and the details of the material obtained from it are summarised below :—

				No. of seeds sown.	Germination stand.	Final Stand.	No. of fertile plants.
<i>G. arboreum</i>	} Doubled x	{	<i>hirsutum</i> ..	20588	4760	4204	1814
<i>G. thurberi</i>			<i>barbadense</i> ..	995	432	306	86
<i>G. hirsutum</i>	} Doubled x	{	<i>hirsutum</i> ..	122	38	30	15
<i>G. raimondi</i>							

The above 1915 fertile plants show a wide range of economic characters, particularly, halo-length. In the coming year, progenies will be grown from about 1,000 plants characterised by earliness, good boll bearing and long staple and rest of the material will be grown as a variable bulk.

(v) Effect of agronomic factors on the yielding capacity of the seed.—This was the second season's trial to find out the performance of sowing seed obtained from a crop grown under different agronomic conditions in the preceding season. This year seed of Jarila obtained from 36 agronomic treatments due to 4 levels of spacing between plants (18", 12", 6" and 3"), 3 levels of manuring (0, 40 lbs. of nitrogen as $(\text{NH}_4)_2\text{SO}_4$, and 40 lbs. of nitrogen as NaNO_3), and 3 types of seed density (water, saline, control) was sown in 4 randomised blocks with uniform spacing, individual plot size being 32' x 4'. Results obtained showed that (1) the seed obtained from widely spaced crop gave much better yield of *kapas* than the one obtained from the closely spaced crop, (2) the seed obtained from manured plots gave lower yield,

and (3) the crop grown from heavy seeds gave seed which yielded better than the one obtained from a crop from lighter seed.

(vi) **Vernalisation.**—(a) **Cold treatment.**—It was pointed out in the last year's report that the cold treatment given to seed of X4463 in 1944-45 had brought about a change of permanent nature in the genotype of the strain which in two seasons gave significantly higher yield than untreated and in one season significantly lower yield. In the season under review, it was noticed that this seed again gave a 40% more yield than the untreated bulk seed of X4463. Thus the four seasons' results obtained hitherto, show that whereas the cold treatment failed to achieve the object of vernalization, it probably brought about some genotypic change. The material obtained from last year's trials will be tested for its performance against X 4463 in large plot size in the coming season.

(b) **Heat treatment.**—During the year under report, an experiment was started to study the effect of giving constant treatment of 28° C for 10, 20 and 30 days to the seed of Dhar 43 and Indore 1. The treated seed when sown in the field failed to germinate. It is proposed to continue this experiment in a modified form in the coming season.

2. Agronomy.

(i) **Long term rotational and manurial trial.**—On the basis of the recommendations made in Dr. A. B. Stewart's report on soil fertility investigations in India, a comprehensive experiment was commenced at Indore in the year under report in order to study the effect of crop rotations, nitrogeneous manuring with inorganic and organic manures and addition of phosphate on soil fertility. The experiment is to continue for a period of 12 years in the first instance, and in addition to measuring the growth and yield of crops, the soil will also be analysed for chemical and physical characters at intervals.

Two rotations, the traditional jowar-cotton-wheat rotation and the improved four course rotation with the inclusion of groundnut in between jowar and cotton, are being compared. Nitrogen and phosphate are applied at the rate of 20 lbs. nitrogen and 20 lbs. P_2O_5 per acre and sources of nitrogen compared are farm yard manure, groundnut cake and ammonium sulphate. Phosphate is applied in the standard form as superphosphate. Frequency of manuring, whether once, twice or thrice, during each rotation is also a factor

under study. There are in all 72 manurial treatments in each crop plot. The experiment is laid out in an average field. The results of the first year's cotton yields are summarised below :—

Nitrogen increased yield significantly and although the difference in yield due to different sources of nitrogen was not quite significant, ammonium sulphate ranked at the top followed by groundnut cake and farm yard manure. Phosphate applied in addition to nitrogen increased yield significantly beyond the average of the yield from nitrogen and phosphate applied singly ; but the different forms of nitrogen did not differ significantly in their interaction with phosphate. Yield figures showing average effect of different treatment are given below :

Yield of kapas in lbs. per acre.

No manure.	Ammonium sulphate.	Groundnut cake.	F.Y.M.		
251	316	295	273		
	⏟				
S.E.	10.3	17.9			
	Nitrogen alone.	Phosphate alone.	Nitrogen plus phosphate.	S. E.	Sig. diff.
	295	273	317	4.8	13

(ii) **Soaking of seed in nutrient solution.**—In the preliminary trial reported last year, there was an indication that soaking of cotton seed for 24 hours in solutions of potassium phosphate prior to sowing resulted in an increase of boll number and yield. The trial was repeated in the year under report with the addition of three more salts, ammonium sulphate, ammonium phosphate and potassium nitrate. The solutions employed were $1\frac{1}{2}$, 1 and $\frac{1}{2}$ molar in strength as in the previous year's test. The soaking was done either a month before sowing and the seed dried and stored or the seed was soaked just before sowing. The control seed was similarly soaked in plain water. Dry unsoaked seed was also sown for comparison. The same four varieties, two *desi* and two American, as were tried last year were included.

Yields of *kapas* per plant for the different nutrient solutions are given below for each variety separately :—

Yield of *kapas* in gms. per plant.

Variety.	Ammonium sulphate.	Mono-Potassium phosphate.	Ammonium phosphate.	Tri-Potassium phosphate.	Potassium nitrate.	S. E.	Control.	S. E.	Dry.	S. E.
Jarila ..	10.2	8.7	7.1	5.0	4.4	0.31	3.6	0.38	2.9	0.54
Dbar 43 ..	9.8	8.0	7.5	6.0	5.5	0.34	3.8	0.41	3.0	0.58
M. U. 4 ..	8.5	7.9	4.3	4.1	3.9	0.23	3.1	0.8	2.9	0.40
X 4463 ..	7.6	7.	5.	5.4	4.9	0.29	3.5	0.35	2.6	0.50

The results are striking. The soaking in nutrient solutions has increased yield over the control in all varieties although the effect is somewhat greater in the two desi varieties than in the American varieties. The behaviour of different nutrients is consistent in the different varieties. Ammonium sulphate followed by mono-potassium phosphate (KH_2PO_4) has brought about the highest increase, the yield for the two nutrient solutions being 2 to 3 times the yield of the control. It is interesting to note that soaking in plain water (control) has given a slight increase over sowing of dry seed presumably because the absorption of water from the soil and germination are quickened in the former. The different concentrations of the nutrient solutions or the two methods of soaking have made no significant difference. The experiment is being repeated in the coming season.

3. Statistics.

(i) **Field technique. Study of incomplete block designs.**—An important point being investigated in connection with the study of efficiency of incomplete block designs is to specify the conditions under which these designs are likely to be profitable. This is necessary in view of the fact that different results have been obtained by different workers with these designs. The studies made at Indore have not generally shown these designs to be as efficient as they have been found in America. The efficiency of the incomplete block design is a function of the intra-class correlation within the complete blocks and within the incomplete blocks. The relationship may be expressed as

$$\text{Efficiency} = \frac{\lambda}{kf} \cdot \frac{r_1}{r_2} \left(\frac{1-r_2}{1-r_1} \right) \quad \text{where}$$

k and f are constants characteristic of the design; λ is the ratio of the true variances between the complete and incomplete blocks and r_1 and r_2 are the intra-class correlation coefficients within incomplete and complete blocks, respectively. These coefficients were actually calculated for a number of designs with cotton and jowar and it was observed that as required by the above relationship, the incomplete block design was superior to simple, randomised blocks where r_1 was relatively large and r_2 small simultaneously. This problem is being studied further.

(ii) **Study of genetic variability and selection in quantitative characters.**—The method of estimating genetic variability by taking the regression of progeny means on parent values was examined further. The method is strictly valid and provides an unbiased estimate of genetic variance only in self-fertilized plants in the absence of dominance. It is also valid when biparental progenies from random crosses are involved even in the presence of dominance. In self-fertilized plants, the method as employed in practice is shown to over-estimate genetic variability when the character concerned is subject to dominance. The degree of over-estimation is highest when dominance is complete and when heterozygotes form the largest proportion of the population as in F_2 . An alternative method is the estimation of variance between progenies grown from selfed seed of the parent plants. As an estimate of genetic variance of the parent population, this estimate has been shown to be better than the regression estimate as the amount of over-estimation is half by the former method as compared to the latter method. Estimates of genetic variance were calculated by the two methods for halo-length in Malvi cotton from various localities in Central India. These results have been published. (Panse and Bokil J. Ind. Soc. Agric. Stat. 1948, Vol. I, pp. 80-91).

(iii) An experiment is in progress to study the relationship between genetic variability and response to selection. In six of the several *arboreum* crosses, which had been made for a statistical study of the genetics of quantitative characters and the results of which were discussed in earlier reports, selection for high halo-length and for low halo-length has been continued from the F_3 onwards. Results upto F_7 , which was grown in the year under report, were reviewed in a preliminary way and are found interesting. The method of selection followed is first to select progenies with the highest and lowest halo-length means in each cross and grow replicated progenies next

year from plants with individual highest and lowest values for the character, adjusted for soil differences as far as possible. The progress by selection is shown below :—

Cross.	Mean halo length in F ₃ . (millimetres.)	Selection for halo-length.	Mean halo-length of selected progenies (millimetres.)			
			F ₄ .	F ₅ .	F ₆ .	F ₇ .
1. D77 x Shan 764	22.5	High ..	25.3	27.6	29.5	31.0
		Low ..	20.4	19.8	19.4	20.8
2. D77 x Gao.115	23.3	High ..	25.4	26.9	27.9	29.9
		Low ..	20.5	20.0	20.4	21.2
3. Cwn.520 x Sh. 764	24.6	High ..	25.9	27.4	28.9	30.4
		Low ..	22.9	20.9	21.6	22.1
4. B.G. x Sh. 764	24.1	High ..	25.8	28.2	28.3	29.7
		Low ..	21.5	20.4	21.6	21.1
5. B.G. x Jarilla	26.4	High ..	27.2	29.2	31.8	32.8
		Low ..	22.8	23.5	23.9	24.5
6. R 10 x Sh. 764	23.3	High ..	24.3	26.9	27.4	29.2
		Low ..	20.2	19.9	21.0	20.9

The most outstanding result is that whereas there is a steady improvement of mean values in the high lines of all crosses as a result of continued selection, the effect of selection in the low lines seems to have come to a standstill either in the first or second generation. In the first cross (D77 x Shan. 764) progress continued for three generations and then ceased. This cross differs from the rest in its response to selection in the high line also. The rate of improvement by selection for high values in this cross is distinctly better than the other crosses which do not seem to differ much among themselves. The gross variance in the F₂ generation of the cross D77 X Shan 764 was also much greater than in the other crosses, although the genetic component of the variance did not differ appreciably from the other crosses. The observed progress has thus been determined by gross variance which would include

the effect of dominance. The results indicate a considerable influence of dominance, and in the cross D77 × Shan. 764 also the influence of a larger number of genes affecting halo-length. Further work is in progress to elucidate these points.

(iv) **Discriminant function for selection of yield in cotton.**—The results of an experiment with 210 Malvi progenies have been analysed and the following coefficients have been obtained for the discriminant formula for yield of seed cotton (with and without the ginning percentage being taken into account) and for lint.

	Yield of seed cotton.		
	With ginning percentage.	Without ginning percentage.	Yield of lint.
b1 (No. of bolls per plant)	0.5002	0.5820	0.4209
b2 (No. of seeds per plant)	0.1720	0.1802	0.1920
b3 (wt. of seed cotton per seed)	1.0000	1.0000	1.0000
b4 (ginning percentage)	-0.2855	..	0.6295

Comparing these coefficients with those obtained in previous experiments carried out for studying this problem, it is seen that the coefficients for the different components are of the same order relatively, in all trials. In the present formula, however, the coefficients for other components are somewhat lower in comparison to that for weight of seed cotton per seed (b_3). The problem of the efficiency of the discriminant function as compared to straight forward selection is being studied.

Scheme for interspecific hybridisation in cottons at Surat.—This scheme was sanctioned by the Committee in January 1938, for a period of five years, with the object of obtaining, if possible, fully fertile hybrids between Asiatic and American cottons, combining the useful agronomic characters of both, particularly the good staple length of the American and hardiness and adaptability to Indian climate of the Asiatic. Work on crossing Asiatic and American cottons, began at Surat in 1932, had already yielded 23 hybrids in which the American parents used were mostly the acclimatised Upland types from different parts of India, while the Asiatic parents were forms of *G. herbaceum* and *G. arboreum*. The hybrids produced from these were, however, sterile and efforts to induce fertility in them were successful only

when they were back crossed to American types. In January 1940, the Committee sanctioned an expansion of the scheme so as to include cytological studies during the remaining period of its continuance. In July 1943, the scheme was extended for a further period of five years from the 1st November 1943, in March last another interim extension of the scheme for a period of six months from the 1st November 1948 was sanctioned.

During the year under review, ten synthetic types derived from fertile backcrosses of (American \times Asiatic) \times American were grown in replicated tests. One was significantly superior to both the controls Co.2 and Suyog, five were bracketted with Suyog and seven with Co.2, for yield. Growth of Co.2 was very healthy this season and its yield was almost as good as that of Suyog. Of the above, 3 types are promising as they have also good combination of ginning percentage (38.5 to 40.4) and staple length (0.97" to 1.03") as against 38.1 and 40.0 ginning percentage and 0.95" and 0.99" staple length of Co.2 and Suyog, respectively.

Out of the 45 progenies representing 9 families grown under compact family block, 8 have been retained for further work on the basis of good yielding capacity, high ginning percentage (more than 38%) and staple length above 25 mm. Additionally, 237 progeny row cultures were tried in triplicate plots during this season. Two of them were significantly superior to Co.2 and 38 were bracketted with it for yield. The ginning percentage ranged from 38% to 42.2% (as against 36.7% of Co.2) and staple length ranged from 25 to 28 mm. (as against 23.5 mm. of Co.2). Special attention is now being paid for selecting progenies having fibre length above 28 mm. and ginning percentage 35% or more, and satisfactory yield.

Material from interspecific hybrids was sent to six places. The derivatives from B.C. 68 (B.C. 125 \times Co.2) and (B.C. 134 \times Co.2) were promising either for combination of yield, ginning percentage and staple length or for staple length alone at Viramgam and Bróach under dry conditions and at Padegaon and Kopargaon under irrigated conditions. It was also confirmed that most of the derivatives were distinctly longer in staple length than the local check varieties, both Indian and American, at all the places under trial.

Preliminary tests of the produce of first generation hybrid of Bourbon \times Sea Island (5th year ratoon) show that it is possible to produce lint of nearly $1\frac{1}{4}$ inch staple length which is also strong and superfine and roughly estimated to spin upto 70-75 counts, by using hybrid seed of such crosses and taking advantage of the dominance of desirable characters.

Selfing of flowers by fixing wire rings over unopened buds.



By Courtesy—I.C.A.R.

Wild species of cotton are being used in crosses with cultivated cottons for introducing resistance to pests and diseases like jassids, thrips, black-arm etc., affecting the cotton leaf. Some of the material has reached third back cross generation showing great resistance particularly to jassids.

Cytological work is in progress to elucidate the behaviour of plant populations raised from crosses of synthetic hexaploids involving wild species with cultivated cottons.

PHYSIOLOGICAL RESEARCH.

Scheme for Cotton Physiological Research, Indore.—Arising out of the work done in the Punjab under this scheme and in view of the desirability of investigating the applicability of the results achieved under it to other areas, the Committee, at its meeting in January 1944, sanctioned a new scheme for Cotton Physiological Research with headquarters at Indore. Under this scheme it was proposed to do work in three cotton tracts, viz., (1) irrigated, (2) partially irrigated and partially rainfed and (3) totally rainfed. The aim was to obtain, as far as possible, precise knowledge of the inter-relationship between the soil and climatic factors and the growth of different varieties of cotton and then attempt to apply the knowledge gained into practice for improving the quality and yield of cotton in general. In February 1947, the scheme was extended for a period of five years, with effect from the 1st March, 1947.

During the year under report, a preliminary replicated field trial was conducted at Indore to study the effect of molybdenum, boron, copper, magnesium, iron, zinc, manganese and chromium on the growth and yield of cotton. Observations made on the crop revealed that the crops treated with zinc, manganese and chromium were definitely greener in appearance than the crops under other treatments. There was also a significant increase in the yield per plant as well as per acre varying from 20 to 25% over the control. If these findings are confirmed in the next season, similar trials will be conducted in other cotton tracts and an effort will be made to determine the part played by these elements in the nutrition of the cotton plant.

The interrelationships of sowing time, spacing and manuring on the growth and yield of cotton were determined on two soil types, viz., (1) soils that become waterlogged during monsoon and (2) well drained deep soils. It was observed that the optimum sowing period for cotton varied according

to the soil type. It was found to be between 25th May and 10th June on water-logged lands and 1st June and 20th June on well drained lands. Rain sowings on water-logged lands gave poor yields of about one maund per acre.

Spacing of cotton was found to be an important factor in increasing the yields per acre. The existing practice in Central India is to plant cotton at a distance of $1\frac{1}{4}$ feet to $2\frac{1}{2}$ feet between rows. Experiments have demonstrated the need for closer spacing and $\frac{1}{2}$ sq. ft. per plant equivalent to 9 inches between rows and eight inches between plants or 12 inches between rows and six inches between plants has been found to be the optimum spacing. Wider or closer spacing than $\frac{1}{2}$ sq. ft. per plant decreased the yield. Similarly closely spaced crops were found to be more benefited by manuring than widely spaced crop.

The study of the effect of water-logging on the growth and the mineral uptake of the cotton plant revealed that the growth of the crop completely stopped during the rainy months and there was no increase in dry matter in early as well as rain-sown crop, even though buds and flowers developed in the former. There was a decrease in concentration of nitrogen and lime (on % dry matter) in the leaves of early sown crop during the same period. These results suggested that the uptake of these two nutrients during the period of water-logging did not occur as there was no increase in total dry matter and the decrease in concentration in the leaves was caused by the translocation of these nutrients to the developing buds, flowers and bolls. The concentrations of potash and phosphoric acid in the leaves however remained almost constant and were not found to decrease during the same months indicating that these nutrients were absorbed even when water-logging occurred. This was another new finding that would require confirmation.

In order to confirm the above conclusion, nitrate and ammoniacal nitrogen of the soil were determined from the same field during the period July to August at small intervals and it was found that a small accumulation of nitrate nitrogen especially in the top six inches of the soil occurred during the period of water-logging indicating that it was not absorbed by the crop. There was no indication of an accumulation of ammoniacal nitrogen during the same period.

The relation between sandiness of a soil and the magnitude of the response to manuring has been established by conducting 16 trials in the different parts of south and east Sind. The results with one exception indicated that

wherever the soils contained more than 50% of sand in the first two feet, a high and profitable response to the fertilizer was obtained and the response was low where the sand percentage was less than 50%. Thus it was highly profitable to manure cotton growing on light sandy soils.

The green-red leaf in American Upland cottons growing in black cotton soils under rain-fed conditions has been found to develop at three stages on growth : (1) vegetative phase ; (2) reproductive phase and (3) at the termination of the reproductive phase in the month of January or February (at Indore) when the dormant buds developed into new small leaves which were either red or green.

The reddening that occurred during the reproductive phase was the most common of all. It was found that the application of sulphate of ammonia to black cotton soils invariably hastened the development of reddening in leaves which was noticeable in pronounced form two to three weeks earlier in the manured plots than in the unmanured plots. It was also found that application of sulphate of ammonia to black cotton soils hastened the maturity of the crop. The index of earliness determined according to Bartlett's formula was found higher in the manured plots than in unmanured plots. Early maturity suggested early depletion of food nutrients or some early change in the metabolic activity of the leaves which may bring about formation of the red pigment. Thus it was expected that the time of reddening may vary to a small extent from field to field according to the differences in the time of crop maturity.

It may be stated that the application of sulphate of ammonia was also found to hasten maturity in the *herbaceum* cottons grown at Surat and *arboreum* cottons grown at Indore.

It is at present not understood why manuring should make the crop early or hasten reddening of the leaves in black cotton soils. The case was quite opposite for yellow-red leaf that developed in American cottons on light sandy lands in Sind, where manuring with sulphate of ammonia was found to remedy or delay the onset of the yellow-red leaf and to cause a delay in the arrival of the crop.

In order to prove experimentally that the maturity of crop and the leaf reddening were directly or indirectly interrelated, plants in a properly replicated experiment were not allowed to reach normal maturity by the removal

of buds as soon as they appeared from the month of September onwards. The control plants were allowed to flower and fruit normally. It was found that the leaves remained deep green uptill the end of the season in the debudded plants while reddening appeared in the control plants in the month of November.

Further investigations on the effect of spacing on growth and yield of cotton in the black cotton soils at Surat again supported the previous finding that nitrogen remained accumulated in the leaves of plants under wider spacing as phosphate was not available in adequate quantity. If phosphate was, however, added, nitrogen came to be utilised and higher yields were obtained. The chemical analysis of the leaves of 1946-47 experiment revealed that the application of phosphate to the soil had significantly increased the phosphoric acid content of the leaves and the leaves of plants treated with nitrogen had been more depleted of phosphoric acid content than the leaves of plants not treated with nitrogen, indicating that more phosphoric acid was utilised for fruit formation in presence of nitrogen.

BREEDING OF IMPROVED VARIETIES.

COTTON RESEARCH IN PROVINCES AND STATES.

BOMBAY.

(a) **Broach Cotton Breeding Scheme.**—The Cotton Breeding Scheme at Broach has been in operation since April 1932. The original object of this scheme was to obtain, by selection or hybridization, suitable types of cotton possessing wilt-resistant, high yielding, high ginning and superior spinning qualities, to replace the local mixture, a large proportion of which consisted of *Goghari* a short staple, high ginning (40%) variety. In view, however, of the Committee's policy to replace, wherever possible, short staple with medium and long staple cottons, attention is now being concentrated on wilt-resistance, high yield and fibre length.

The breeding of wilt-resistant types originally formed part of the Broach Breeding Scheme, but as it was considered desirable that this work should be done under optimum conditions of wilt infection, and as the required conditions, especially soil temperature in pots, were difficult to maintain at Broach, this part of the work was transferred to Poona, in June 1935, together with similar work on cottons for the Jalgaon tract.

During the year under report, the bulk seed of ten promising cultures from crosses of B.C. 1-2 and 1027 A.L.F. along with No. 3652 (wilt-resistant type bred at Shera) with B.C. 1-2 as check were tried in randomised replicated tests in wilt-free soil. Five cultures were significantly superior to B. C. 1-2 in respect of seed-cotton yield, while the rest including No. 3652 were bracketted with it. In respect of lint yield, three of the five were significantly better and five including No. 3652 were as good as B.C. 1-2. As regards ginning percentage, 6 cultures were as good as B.C. 1-2 and the remaining were significantly lower. In staple length all of them were superior to B.C. 1-2 by 0.2 to 1.2 mm.

In wilt-sick soil, B.C. 1-2 and 2 other families from crosses of B. C. 1-2 and 1027 A. L. F. were completely free from mortality and partial wilting, while the remaining families and 1027 A. L. F. suffered to an extent of 0.7 to 3.5% mortality and 1.1 to 66.2% partial wilting, respectively. The average yield per plant in all the families was higher than B. C. 1-2 and 1027 A. L. F. used as checks. The ginning percentage ranged from 37.1 to 42.1 as against 41.8 and 33.8% of B. C. 1-2 and 1027 A. L. F., respectively. In staple length, all of them were intermediate between B. C. 1-2 (23.0 mm.) and 1027 A.L.F. (24.9 mm.)

Three hundred and forty promising single plant selections from the additional material of the crosses and back-crosses of 1027 A. L. F. with B. C. 1-2, B. C. 1-6 and B. C. 5-18 were grown in single rows. From these, 134 cultures having ginning percentage from 37.0 to 46.2%, staple length from 22.1 to 24.3 mm. and freedom from wilt have been retained for further work.

Ninety two early maturing wilt-resistant selections with ginning percentage ranging from 38.0 to 41.6%, and staple length from 21.5 to 22.8 mm. from the crosses and back-crosses of B. D. 8 Early, Maktampore Early 2-3 and 2-5 with B. C. 1-2 and B. C. 1-6 were grown in progeny rows. Of these, 45 progenies have been selected for further work. They have the ginning percentage ranging from 39.5 to 45.4 and staple length 20.1 to 22.7 mm. as against 42.1 ginning percentage and 22.2 mm. staple length of B. C. 1-2.

The results of spinning tests of 1946-47 show that Farm Vijay and District Vijay Stage 'A' gave practically the same spinning performance *viz.*, 38's H. S. W.C. While District Vijay Stage 'C' and 'B' were lower in spinning capacity by 2 and 6 counts, respectively, all the four samples of Vijay were equal in fibre length as well as as in fibre weight per inch.

Vijay cotton (B. C. 1-2) was multiplied on an area of 3 acres for supply of pure seed to the Vijay Seed Multiplication and Distribution Scheme for Middle Gujerat and 1140 lbs. selfed and 520 lbs. open fertilized seed was produced this season.

(b) **Jalgaon Cotton Breeding Scheme.**—This scheme has been in operation since April 1932. Its original object was to obtain, by selection or hybridisation, suitable wilt-resistant types with heavy yielding, high ginning and good spinning qualities to replace the local mixture of N.R. and *Banilla* cottons in Khandesh. Wilt-breeding work was originally included in the Broach and Jalgaon Cotton Breeding Schemes, but, in August 1936, it was decided that the wilt work should be treated as a separate scheme from the 1st April, 1937. In July 1941, the wilt-breeding scheme was extended upto 31st March 1947. In February 1947, it was again extended for a further period of five years from the 1st April, 1947.

During the year under report comparative district trials of 197-3 and *Jarila* were arranged in 24 places under varying conditions of soil. The results when analysed statistically confirmed the superiority of 197-3 over *Jarila* in yield of *kapas* and lint per acre, ginning percentage and staple length. The strain has been valued on an average at Rs. 64 on *Jarila* per *khandi* (784 lbs. lint.) The new variety has been adjudged suitable for 19-21's highest standard warp counts i.e., about 2 to 3 counts lower than *Jarila*.

Only one mill test on the bulk sample of *Jarila* and 197-3 could be arranged this year. The results are not comparable as strain 197-3 and *Jarila* happened to be grown on plots with a wide fertility difference.

The mortality due to wilt was less than one per cent in both 197-3 and *Jarila*. The strain possesses white flowers as against the yellow flowers of *Jarila* and thus possesses a very useful distinguishing mark. Size of petal is also bigger than that of any white flowered *roseum* variety.

The following crosses are being pursued with a view to pick out segregates showing better performance than 197-3, either in one or more of its agricultural and fibre attributes :—

Cross IV [(*Jarila* x N. R. 5) x *Jarila*] BC. 5 :—

Cross VIII [(*Jarila* x N. R. 5) x *Jarila*] BC. 1.

(New Back cross). Five best progenies were tried in replications on Jalgaon Farm. Out of these Nos. 29-7-4, 29-7-5 and 29-7-6 showed superiority

over Jarila in yield, ginning percentage and staple length. They will be tested further. Besides these, 13 out of the 71 plant-to-row cultures were selected for further observations.

Four new crosses were made this year with 197-3 as their basis and are meant for improving further its ginning, yield, fineness of fibre and wilt-resistance.

Secondary selections in Jarila :—

After the examination of about 2000 plants in the field and of 500 plants in the laboratory, 108 plants were finally chosen for next year's study.

The Committee at its meeting in November 1947 sanctioned a new scheme for cotton breeding in Khandesh for a period of 5 years from the 1st April, 1948. This new scheme has now replaced the Jalgaon Cotton Breeding Scheme.

(c) **Scheme for breeding wilt-resistant cottons in Surat area.**—This scheme was sanctioned by the Committee in August 1936 and commenced work in April 1937. The object of the scheme is to obtain a strain of cotton completely resistant to wilt and suited to the natural conditions obtaining in the Surat tract. This is sought to be achieved either by selection in 1027 A.L.F. or by crossing this cotton with B.D.8 or other wilt-resistant strains.

During the year under report cultures from the following three crosses were tested in wilt-sick plot at Shera :—

(1) [(8-1 x K. F.) x 8-1] x 8-1 F5

Material of this cross is found to be completely resistant to wilt under field conditions. It also combines earliness, good yield, good staple length and fairly good ginning percentage. The feel of the staple, however, is coarse and not up to the standard usually associated with Surat Cotton.

(2) (8-1 x B. C. 1-6) F9

Of the three cultures of this cross *viz.*, 2266-1-4-2, 2266-1-4-3 and 2231-6, the first two are similar in respect of ginning outturn, staple length and resistance to wilt under field conditions. These three characters are fairly good in both, but the first one is coarse in staple feel. Culture 2231-6 is characterised by very high ginning percentage and better staple feel. This culture, is, however, late and is shorter in staple length.

(3) (1027 A. L. F. x B.C. 1-6)F9

Culture 3652-22-2-11 of this cross seems to be promising as it combines high ginning percentage, good staple length and feel combined with high degree of wilt-resistance. Further selection for higher resistance to wilt is in progress. The culture has been crossed again with 1027 A. L. F. for further improvement in staple length.

(d) Scheme for improvement of Wagad cotton at Viramgam, Jagudan and Bavla.—While examining the possibility of growing medium and long staple cottons in the short staple areas of India, the Committee, in August 1935, decided that, in view of the absence of any serious attempt to improve the cotton of the large *Dholleras* tract, a comparative study of Indian and Iranian *herbaceum* cottons should be undertaken, with the object of finding out one or more suitable types for the tract. A special officer was deputed to Iran to collect *herbaceum* types of cotton grown there and, in August 1936, a five-year scheme was sanctioned for the improvement of *Wagad* and *Mathio* cottons, the work on *Wagad* cottons being centred at Viramgam and that on *Mathio* at Amreli. The object of this scheme is the improvement of *Wagad* cotton for (a) quality and yield and (b) earliness in order to escape frost. These improvements are sought to be achieved by (a) selection in *Wagad* cotton, (b) hybridization with Surti-Broach quality cottons like 1027 A.L.F. and B.D.8 and (c) hybridization with Iranian *herbaceums* known to be early and of better quality.

The whole of the *Wagad* area is divided into two main tracts (i) the Viramgam tract, characterised by low rainfall and (ii) the Dholka tract with greater and more regular rainfall. The main breeding station is situated at Viramgam and simultaneously a small area is being maintained under irrigation at Jagudan to safeguard the work at Viramgam. In July 1941, it was decided to establish another sub-station at Dholka for conducting botanical work on the promising material obtained from Viramgam.

During the year under review, K. 72-2 (Kalyan) was tested against Wagotar and Local Wagad at Viramgam, Bavla and Jagudan. The results showed that on the whole K. 72-2 maintained its usual superiority over Wagotar and Local Wagad in respect of yield, ginning percentage and spinning quality.

Out of 15 quality types tried at Viramgam, Bavla and Jagudan, 4 were retained for further study in view of their promising performance. In addition, several F1 and F2 progenies of crosses made with the object of combining early maturity with other economic characters, were under observation and the desirable ones amongst them were selected for further study.

K. 72-2 was in good demand in the market during the year under report and the maximum premium realised was Re. 1 per 40 lbs. of *kalas* (dry bolls) and Rs. 5 per 40 lbs. of lint over the local crop.

The average acre cash value of the *kapas* of K. 72-2 was estimated at Rs. 172 against Rs. 139 of Wagotar and Rs. 140 of Local Wagad.

(e) **Scheme for improvement of Dharwar-American Cotton.**—This scheme was sanctioned by the Committee in July 1941 for a period of five years, and the work was commenced in April 1942. It was extended in February 1947 for a further period of five years. The object of the scheme is to improve the Dharwar-American cotton crop grown in the Kannada districts of the Bombay Province, the adjoining areas of the Madras Province and in Hyderabad and Mysore States. This object is sought to be achieved by the development, (by selection or hybridisation) of an early maturing type, superior to Gadag 1 in respect of yield, staple length and ginning percentage, and which is, at the same time, more resistant to 'red-leaf' blight. The work is being done at Gadag, where conditions of soil, climate, rainfall, etc., are suited to the cultivation of *hirsutum* cotton.

The standard improved variety Gadag-1 isolated from acclimatised Dharwar-American variety is superior to the latter in several respects. To enhance ginning outturn, and resistance to red-leaf blight of Gadag-1, it was crossed with Co2. Out of the several families isolated from this cross, seg. 9-3 was found to combine all the requisite field and trade characters. During the last six years, 9-3 was compared with Gadag-1, both on the breeder's plot at Gadag and on the cultivators' fields, where it showed consistent superiority over Gadag-1 in *Kapas* yield by 26.9%, in ginning outturn by 3.3%, and in resistance to red-leaf-blight by 85.6%. The staple length and spinning value of 9-3 are respectively 0.93" inch and 42 counts against 0.85" in fibre length and 32 counts of Gadag-1. Comparative mill tests of both these varieties have been arranged for.

For further improvement of 9-3, this strain has been crossed with Co2 Co3, Co4, 44113, Perso-American, M-4, Kampala, Jinjiya, 4F-98, Sind-Sudhar, L. S. S., and Parabhani-American.

Effects of manures on yield and incidence of 'red-leaf-blight' were also studied.

EAST PUNJAB.

(a) Scheme for improvement of cotton of south-eastern districts of the Punjab.—

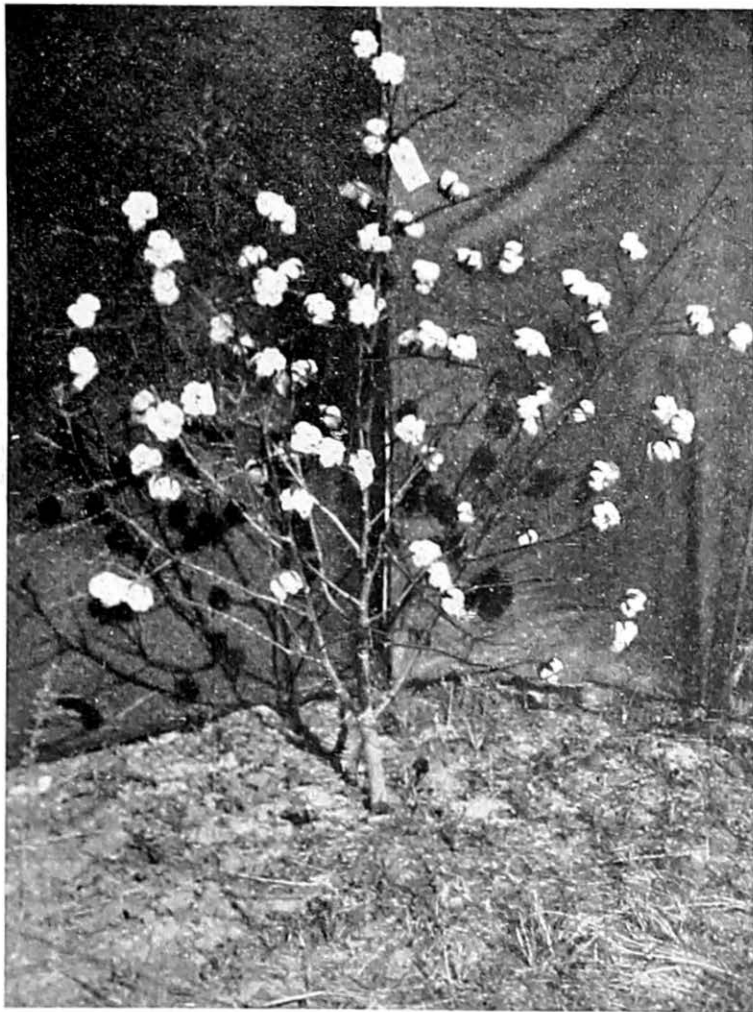
This scheme is an offshoot of the Punjab Botanical Scheme . It was sanctioned by the Committee in July 1944, for a period of five years. At its meeting in January 1945, the Committee, however, reduced the sanctioned period of the scheme from five to two years, as it decided to review the position at the end of 18 months in regard to the extent of the elimination of *desi* cotton in the Canal Colonies. The scheme came into operation at Hansi on the 1st March, 1945. In August 1946, an extension of the scheme was sanctioned for a period of 3 years from the 1st March, 1947.

The object of the scheme is to replace the area under *desi* cotton by high quality American cottons in the irrigated portions of the tract without, however, losing sight of the desirability of breeding improved *desi* types which will continue to be grown in certain parts of the districts in question.

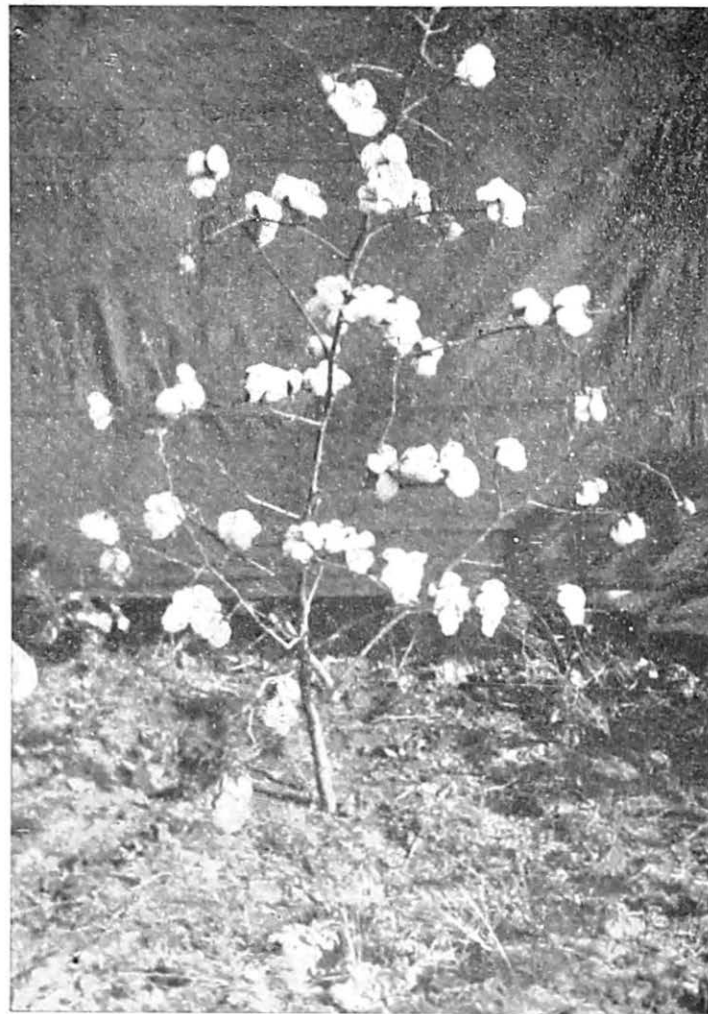
The work so far carried out on *desi* and American cottons has yielded two improved strains (one of each type) which have, in the extensive trials carried out, proved superior to the existing local varieties. The improved *desi* strain, 231R, gave an average yield of 13.9 maunds of *kapas* and a ginning outturn of 41.7% against 11.98 maunds per acre and 38.3% ginning, respectively of the standard Mollisoni strain, M 60 A2. The new American improved strain, "Hariana," which has passed the experimental stage and has been approved departmentally for distribution in the tract, was tested again on the cultivators' fields. It was found to give a mean yield of 14.08 maunds *kapas* per acre against 12.09 maunds of the *desi* variety M. 60A2 It has a staple of 0.92" and a ginning percentage of 32.8, and it is capable of spinning 34's standard warp counts against 6's of Mollisoni.

During the year under review, 535 maunds of seed of "Hariana" were distributed in the districts of Hissar, Rohtak, Gurgaon and Karnal, to cover an area of approximately, 2,000 acres during 1948-49.

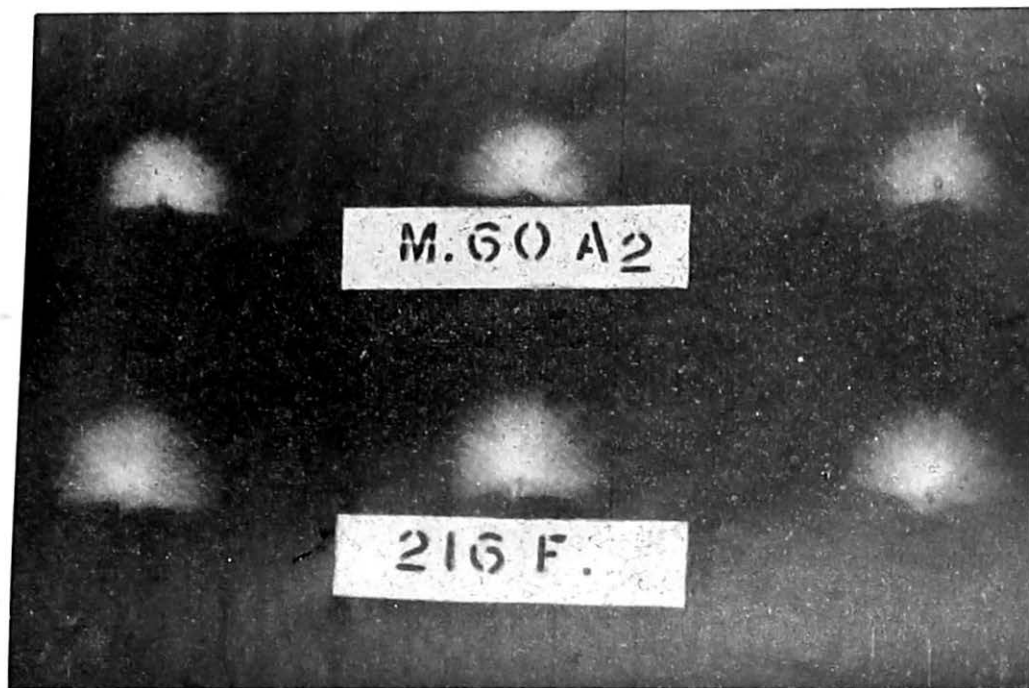
Improved varieties of East Punjab Cotton.



Plant of Punjab-American 216F. (Haryana).



Plant of L. S. S.



Staple of Punjab-American 216F compared with that of the improved *Desi* (indigenous) strain, M 60A2.

It is reported that two more American strains, AC 101 and AC 102, which are even more promising than "Haryana" have been produced. These will be further studied in the coming season.

CENTRAL PROVINCES AND BERAR.

Central Provinces and Berar Cotton Breeding Scheme.—The Central Provinces and Berar Cotton Breeding Scheme was sanctioned by the Committee for a period of five years with effect from the 1st April, 1939, in replacement of the Central Provinces Botanical Scheme which terminated on the 31st March, 1939. It was extended for three years from the 1st April, 1944 and for six months more from 1st April 1947. It was again extended for six months from 1st October 1947. The object of this scheme is to evolve, by selection or hybridisation, suitable new strains of cotton which can compete successfully with the local Oomras in point of ginning outturn and yield and which, at the same time, possess a staple capable of spinning between 20s and 25s standard warp counts. The scheme is worked at Nagpur and at Akola, to suit the special requirements of the Central Provinces and Berar respectively. Breeding of high ginning strains of Buri cotton for the Burhanpur *tahsil* also forms part of this scheme.

During the year under review, the season on the whole was unfavourable to the cotton crop. The average outturn per acre was over 300 lbs. of *kapas* against 329 lbs. in the previous year. The area covered by V. 434 was 3,06,998 acres against 325,775 in the previous season and that by Jarila, 1,333,729 acres against 1,427,762 last year. ,

In the field tests of promising *desi* strains against V. 434 and local Jadi, the superiority of M. 5A, H. 420, 91, B.40 and No. 99 over the controls in respect of yield was recorded. M. 5A is said to be the best quality strain, being adjudged suitable for 34's standard Warp counts against 28's of V. 434 and 32's of *Jarila*.

A comparison of the results of trials of H. 420 against V. 434, Jarila and Local Jadi conducted in Nagpur, Nimar, Wardha and Chhindwara districts during the past four years showed that H. 420 was the highest yielding strain in Nagpur and Nimar districts, though in Wardha and Chhindwara it stood second. As regards monetary return, H. 420 gave the highest cash value per acre in all districts except Chhindwara. It is stated that there is a great demand for its seed from various parts of the province, particularly from

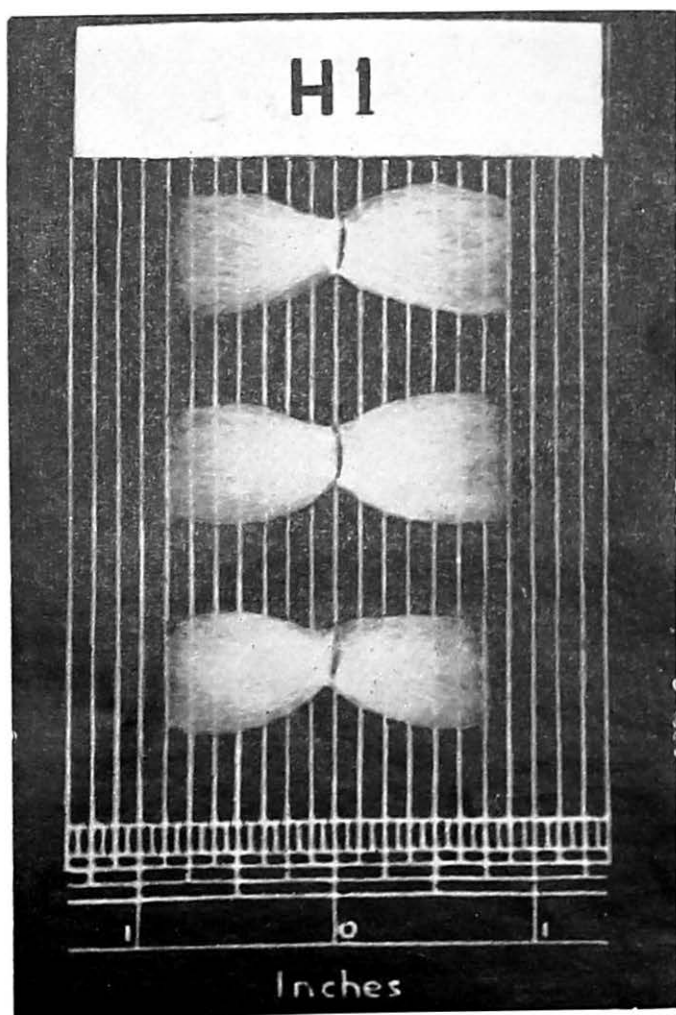
Nimar district, where it is reported to have been grown on an area of about 43,200 acres in the season under review. In the trials in Berar, H.420 gave the highest cash value per acre in Amraoti and Buldana districts, while in Akola and Yeotmal districts, Jarila was found to give the maximum cash value per acre.

Buri 107, which is grown on a large scale in Burhanpur *tahsil*, has spread to certain parts of Berar, particularly in Amraoti district. It was grown on 25 acres on the Akola farm and its yield averaged 437 lbs. per acre against 248 lbs. in the previous year. As a result of further selection, 3 improved strains, viz., 0394, 0396 and 0382, showing a definite improvement over Buri 107, have been evolved. Of these three strains, 0394 has proved to be the best both in respect of yield and ginning percentage.

MADRAS.

(a) **Scheme for Improvement of Mungari Cotton in Madras Province.**— This scheme was sanctioned by the Committee in 1937 and has for its object the evolution of strains suitable to the red soils and combining the quality of the Westerns with the yield of Mungari, to replace the inferior Mungari, the existence of which affords opportunities for mixing, with the result that the better cottons of the tract fail to get their proper value. On the black soils of Anantapur, Bellary and Kurnool districts of the Madras Province, cottons commercially known as Westerns and Northernns are grown. These are medium staple varieties, capable of spinning 24s to 32s' counts. The type of cotton grown on the red and mixed soils, on the other hand, is that known by the name of Mungari, which is a coarse, short staple variety, similar to Bengals, and not fit to spin more than 8s or 10s. The co-existence of varieties of widely different values favours undesirable mixing, with the result that the better cottons suffer in price. It is to overcome this difficulty that the Mungari scheme was started. In January 1942 the scheme was extended for five years from the 24th May 1942 and in February 1947, for a further period of three years.

During the year under review, the new strain 881F was tested in three taluqs—Adoni, Hadagalli and Nandyal—in the cultivators' fields. The results showed that this strain gave on an average about 300 lbs. of seed-cotton per acre and that the lint fetched a price equal to that of the Farm Westerns. The strain is adjudged suitable for spinning 30's Standard Warp Counts against 10's of the local Mungari. The demand for its seed is reported to be great.



Improved strain of *Herbaceum* cotton from Madras.

The trials with 14 selected American varieties showed the superiority of five of them in respect of yield over the local and 881F against which they were compared. In another experiment with early types, one culture, 3920 was found to be the best biotype combining all the desirable characters and excelling the mean values of 881F as regards staple length and early maturity.

Owing to very low incidence of stenosis during the year, the comparative resistance of the promising selections in the progeny rows to this malady could not be assessed. Fresh crosses to combine yield with earliness, medium staple, and high ginning outturn were effected.

(b) Scheme for Improvement of Cocanadas cotton in Madras Province.—

This scheme was sanctioned by the Committee in November 1938, for a period of five years. The work was started from 1st February 1940. The object of the scheme is to improve the yield and ginning percentage of Cocanadas cotton, preserving at the same time the light pinkish colour of its lint owing to which it is in great demand for the manufacture of dyed yarns. In July 1944, an interim extension of 6 months from 1st February, 1945, was sanctioned and in January 1945, a further extension of 4½ years from 1st August 1945 was sanctioned.

Studies on the variability of economic characters revealed that (a) plant habit characters were affected by changes in environment (b) lint colour was modified by a change in locality of growth (c) conjoint variability for all characters was absent in all bulk collections (d) there was wide scope for the selection of plants with single attributes like staple, ginning percentage or colour (3) plants with deep coloured lint had always a shorter lint length and coarser fibre (f) Godavari district was likely to be a secondary centre of origin for 'Cocanadas' as judged from the variability and isolation of six new botanical types and (g) heritable variability for colour was abundant in Godavari district but from the point of view of other attributes, Guntur district possessed the largest useful variation and (h) preliminary survey and analysis of the white cotton variety in the Vizagapatam district showed that the yellow-flowered *Buradapathi* had longer staple than the white flowered type.

Lint colour was affected by changes in environment. Heavy dew or rains at harvest stage followed by bright and hot weather, intensified the colour. Dry hot periods, cloudy days with low temperatures and harvests of unripe bolls contributed to colour dilution. Detailed study of the fibre properties disclosed a very strong association between depth of colour, short-

ness of staple and coarseness of fibre. In view of these findings, the requirements of the trade and mills were ascertained. The consensus of the opinion was in favour of a biotype having the colour grade of the variety now in cultivation with improvements in strength and cleanliness.

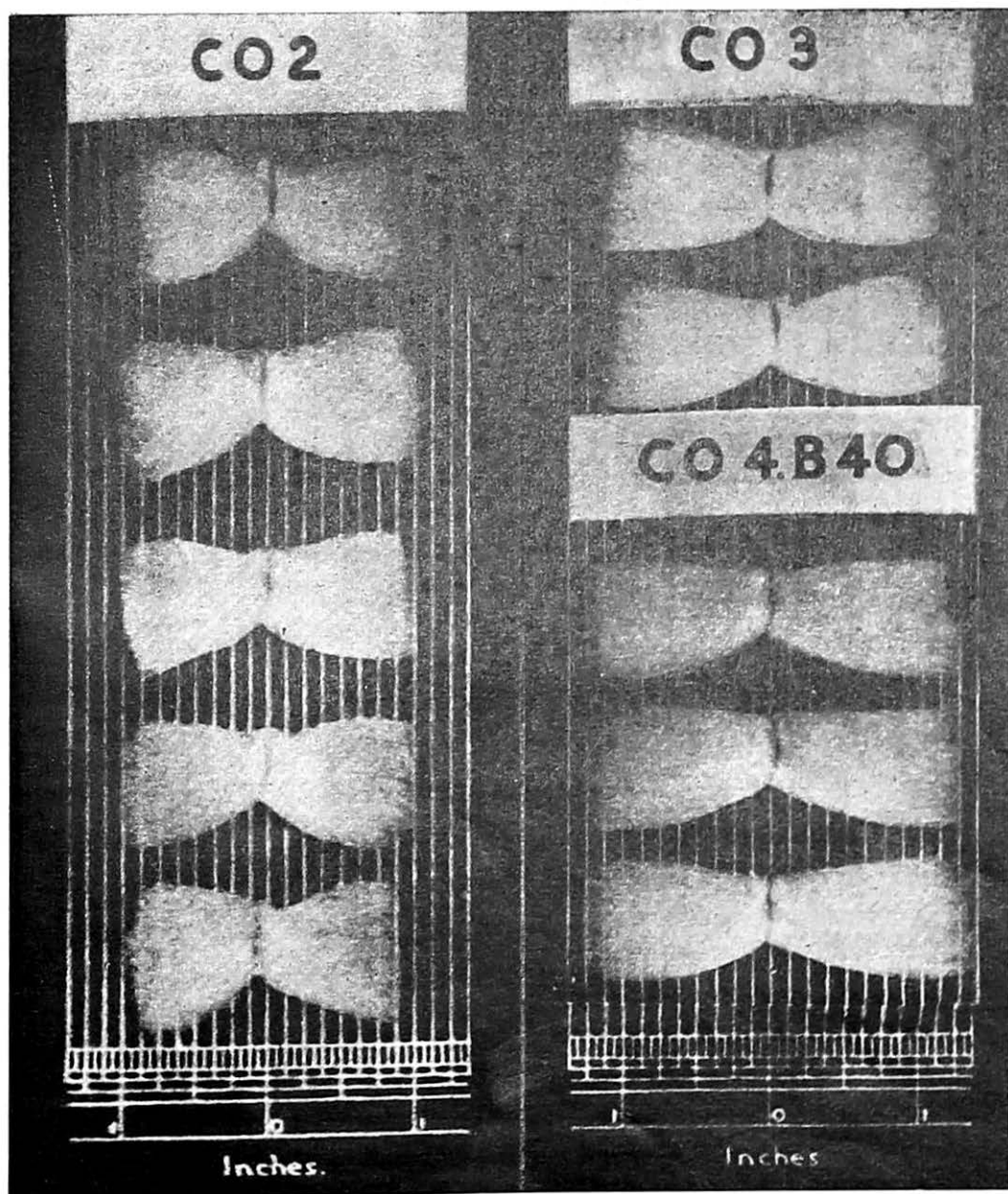
Interstrain crosses were effected for the synthesis of colour-staple combinations beyond the limits noticed in natural populations but so far the mean staple length of the best biotype isolated by this method has not exceeded that of the best pure line. They, however, contributed to the increase of productivity and ginning. Interforma hybridisation was, therefore, taken up as the next promising line of attack and crosses between *indica* strains possessing staple, fineness and adaptability on the one side and *burmanica* varieties having staple colour genes, were made and studied. Reselection in Manipur khaki yielded biotypes possessing colour grade over 3 and staple of 23 mm. and this is being used as a parent in later crosses. Three varieties in the collection *viz.*, Manipur Khaki, Nanking Khaki and G. 1019 have been employed as parents and the work is in the early stages.

The 'Chinnapathi' zone characterised by early season and inferior quality like *mungari* in Ceded Districts did not possess any variability for applying selection. Conversion into a medium staple white cotton area of replacement by a coloured variety were the two alternative possibilities for this tract. G. I. was unsuitable on account of its late habit. Hybridisation with early types has been commenced to evolve the desired biotype. Jarila and 881F from the white linted group were as good as Chinnapathi in yield and far superior in quality. There was no outstanding type from the coloured group and as such fresh crosses were programmed and partly carried out.

G. I is a strain evolved at Guntur through interstrain hybridisation. It possesses all qualities except the desired colour shade. The opinions elicited through technological tests, trade valuations and consuming mills were generally in its favour in spite of its lighter shade. Trials on cultivators' lands indicated that it could be distributed in zones where the quality of cotton now produced was inferior in staple and variable in colour. The whole of the Nellore district, Red Northern area of Kurnool district and eastern talukas of Guntur District would fall under this category.

(c) **Scheme for breeding Cambodia cotton in ceded districts in Madras Province.**—This scheme was sanctioned by the Committee in July 1944, spread over a period of five years.

Staples of Improved Cambodia (American) Strains from Madras.



Co. 4. B 40 is not only the latest improved strain but also is the longest stapled.

The co-existence of several varieties differing in quality, the paucity of variation in the indigenous mixed *desi* material resulting in no progress being made in the improvement of the 'Northern' and 'Western' cottons and the prospect of bringing a million acres or more under the Tungabhadra irrigation project are the main reasons for undertaking this scheme. The objects of the scheme are (1) to evolve a long staple American variety capable of giving good yields when grown as an irrigated *rabi* crop, and (2) to breed an exotic type suitable for cultivation in the unirrigated regions not served by the Tungabhadra project.

The work is conducted at three centres—Siruguppa, Hagari and Nandyal representing three distinct regions, *viz.*, (1) irrigated black soil, (2) unirrigated black soil, subject to variable rainfall, and (3) unirrigated black soil, characterised by heavy rainfall and early season.

During the year under review, the yield of the experimental crop was low. The drought caused by scanty rainfall and the breakdown of the pumping engine were deemed responsible for this. In the trials conducted at Siruguppa under irrigation, nine of the best selections of the previous season together with seven varieties from Nanded and seven types from Lyallpur, were tested against H. A. 11, the control variety. M. A. II was the only type which was significantly superior to H. A. 11 in respect of yield of seed cotton and lint. Seven more types gave yields of seed cotton equal to the control. A review of the results obtained during the past several years showed that M. A. II is the most consistent type that has maintained its first rank in respect of yield, earliness and jassid resistance. Nevertheless a preliminary examination of the different economic characters revealed that further improvement of this variety through re-selection was not possible. Accordingly M. A. II along with other desirable types was extensively used for crossing with selected bio-types possessing the desired characters. Of the various crosses tested, those involving M.A. II and G. 1 x Co. 2-5 were found to be promising; they combine higher ginning and greater lint length than those of the parental types. In the trials under rainfed conditions carried out at Nandyal and Hagari, four varieties, M.A. II, D.A. 2-6-5/3, H.A. II and 11-43-8380 have been found to be equal to the control in regard to yield of seed cotton.

UNITED PROVINCES.

Scheme for hybridisation in arboreum cottons.—This scheme was sanctioned in July 1943 and it came into operation on the 1st April, 1944.

The object of the scheme is to evolve strains of *desi* cotton, primarily for the rainfed areas of the Province, which, while possessing the earliness, hardness, yield and ginning qualities of C.520 would be capable of spinning higher counts than the latter. This is proposed to be achieved by crossing some of the promising strains obtained under the United Provinces Botanical Scheme with superior quality cottons, such as *Jarila*, *Verums*, *Indicums* (*Banis* and *Gaoranis*), *Shans* and *Million Dollars*.

During the year under review, work on *desi* cottons was carried out at the Bulandshahr and Raya Experiment Stations and the hybrid material available in the different stages of F1 to F4 and F6 to F9 of the crosses of C.402, C.520 and survey selections with better varieties such as *Jarila*, *Verum*, *Bani* and *Gaorani* were studied. 19 progenies gave significantly higher yield than C.520 (control) and were found superior in one or other economic characters.

The work on American cottons has for its object the evolution, by hybridisation or selection, of strains superior to Perso-American in yield and quality. Several successful crosses were made, using Perso-American, Punjab-American, Parbhani-American, Iran-American and 104F as parents and selections superior to the parents in one or more economic characters have been obtained.

ASSAM.

Scheme for improvement of hill cotton in Assam.—This scheme was sanctioned by the Committee in January 1944 for a period of five years and it came into operation in February 1947.

The scheme has for its object the production of high yielding types of coarse short staple cotton with high ginning percentage.

During the year under review, the material tested at Jorhat Experimental Farm consisted of selections made previously from all the cotton growing tracts of Assam. The types under study included 32 from the Garo Hills, 7 from the Naga Hills, 16 from the Mikir Hills, 11 from Comilla, 11 from the Mismi Hills, 9 from the Chittagong Hills, 3 from the Lushai Hills, 15 from the Haflong Hills and 38 of long and medium staple Upland cotton. Selfing was carried out for the maintenance of the purity of the types but owing to the departure of the Botanical Assistant for training, the material could not be studied in detail. The *hirsutum* types are reported to have fared very badly; some of them were not able to stand the weather conditions, and others

were affected severely by jassids. The insect pests, *Sphenoptera gossypi*, Jassids, *Platyedra gossypiella* and *Dysdercus cingulatus* were found to do some damage.

HYDERABAD STATE.

(a) **Gaorani Cotton Improvement Scheme.**—This scheme, which is an off-shoot of the Hyderabad Botanical Scheme, was sanctioned by the Committee in July 1943, for a period of 5 years from the 1st April, 1944.

The objects of the scheme are :—(1) production of suitable, fine quality wilt-resistant strains of *bani* cotton for the three different zones, viz., North-East, Central and South-West portions of the *Gaorani* protected area, and (2) evolution of a suitable Upland American strain for the highlands of Adilabad. Work in connection with the production of wilt-resistant types of *Gaorani* is being conducted at Parbhani as part of the newly sanctioned scheme for the improvement of Oomras cotton.

The work in connection with this scheme was located at Madhol, Nanded and Latur representing the north eastern, central and south western parts of the *Gaorani* Protected Area. Preliminary work for the production of a suitable upland strain for Adilabad Plateau was carried out at Madhol. In addition, the agronomic experiments with cotton started in 1941-42 were continued.

North eastern Gaorani Protected Area.—The three wilt resistant types tested in the main varietal test viz., P-II-43-159 (*Gaorani* 6), P-II-43-165 (*Gaorani* 6E-3) and II-42-7316 (*Gaorani* 6E-3) from the 1946-47 crop at Parbhani spun to 33's, 35's and 40's highest standard warp counts respectively.

Central Gaorani Protected Area.—Of the two strains II-42-7310 (*Gaorani* 6) and N-II-42-165, which gave a promising performance in the previous years, the former spun to 31's and the latter to 29's. As such these do not compare favourably with *Gaorani* 6. In the varietal test at Nanded, *Gaorani* 6E-3 and *Gaorani* 12F-2, though similar to *Gaorani* 6 in other respects, spun better than it. *Gaorani* 12F-2's performance on cultivators' fields in the past two seasons coupled with the more vigorous habit and somewhat better resistance to wilt makes it a serious competitor to *Gaorani* 6, the variety now under large scale cultivation.

South western Gaorani Protected Area.—*Gaorani* 12F-2 has justified the decision taken by the Indian Central Cotton Committee on the multiplication and distribution of this variety in this area. The higher ginning sub-strains of this variety need further trial.

There is a tendency of the earlier maturing selections from *Gaorani* 4M-II to spin lower than the parent but two cultures from the sub-strain, II-44-1464 are reported to be promising for wilt-resistance under controlled conditions at Poona.

Adilabad plateau.—The work of this tract has not made much progress due to the lack of a proper experimental farm at or near Adilabad.

Production of selfed seed of *Gaorani* 6, *Gaorani* 6-E-3 and *Gaorani* 12F-2 to form the nucleus of large scale multiplication of these varieties was continued. The area covered by the improved varieties (Departmental seed) during the year under report was as follows :—

Variety.	Area covered (Acres).	Tract in which the crop was grown.
Gaorani 6 ..	2,56,000	Nanded district.
Gaorani 6E-3 ..	15,732	Wadi Buzurg and villages surrounding it in Nanded district.
Gaorani 12F-2	10,500	Latur, Kallam and Ahmedpur taluqas of Osmanabad district.

(b) **Scheme for Improvement of Cotton in Parbhani district.**—This Scheme, which is an off-shoot of the Scheme for improvement of cotton of Oomras tract in Hyderabad State, was sanctioned by the Committee in February, 1947 for a period of five years. The scheme started functioning from the 1st April, 1947.

The objects of the scheme are :—

- (1) the production of a high ginning and high wilt-resistant strain of G. 12F-2 suitable for the entire district of Parbhani, if possible,

the production of similar other strains from basic material other than G. 12F-2,

- (3) the maintenance of the improved strains of American cotton bred for the *ghat* area of Aurangabad district,
- (4) the study of wilt-resistance in field conditions at Parbhani and under optimum conditions of temperature and infection at Poona,
- (5) the carrying out of district trials of the improved strains against the local variety.

The following is a summary of the work done during the year under review :

- (a) Efforts to produce a higher ginning and wilt-resistant strain of *Gaorani* 12F-2 resulted in the production of nine strains; of these, three strains, *viz.*, II-43-35, II-44-1231 and II-44-1290 were under trial in cultivators' fields.

Further one sib of *Gaorani* 6 (II-43-159) and two of *Gaorani* 6E-3 (II-42-7316 and II-43-165) gave promising results and deserve further trial.

- (b) Five other strains obtained from basic material proved to be higher ginning than *Gaorani* 12F-2 and fairly resistant to wilt. All of these are suited to the southern part of Aurangabad and Bhir districts.
- (c) Eleven cultures derived from a progeny of *Gaorani* 16C (II-41-6838) were found 100 per cent wilt-resistant at Poona under optimum conditions of wilt-infection, temperature and humidity. Of these, two cultures possess desirable fibre characters and ginning percentage.
- (d) In the district trials, *Gaorani* 12F-2 maintained its superiority in yield and spinning quality. The performance of its higher ginning sibs (II-43-35, II-44-1231 and II-44-1290) needs to be studied further.
- (e) In the heavy soils of the *ghat* area of Aurangabad district, all the improved American varieties except II-43-8380 yielded better than the local American crop. The improved varieties are all earlier maturing and higher ginning than Parbhani American 1.

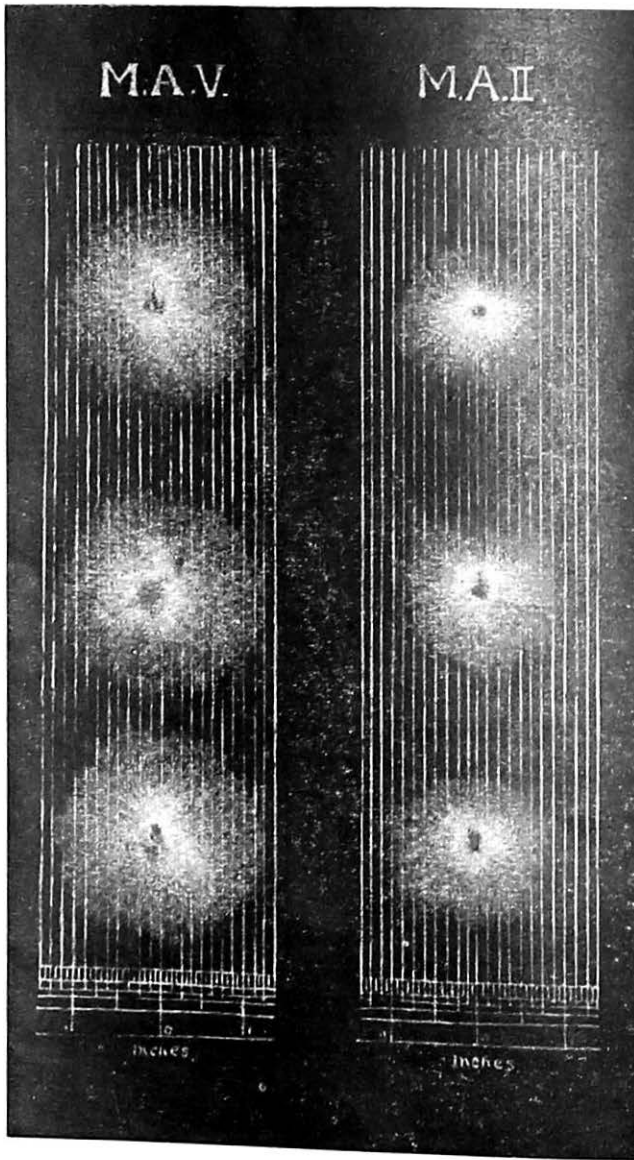
(b) **Scheme for improvement of Kumpta cotton.**—This scheme was sanctioned for a period of five years and it came into operation in November 1937. The object of the scheme is to develop certain strains of Kumpta cotton bred from the local variety of Raichur which, in the preliminary tests conducted at the Government Experimental Farm, Raichur, prior to the starting of the scheme, had given better yields of both seed-cotton and lint than either the local variety or improved *Jayawant*. After two years' work, the strain Raichur-Kumpta 15 was selected for further development. It was sown in 1939-40 on an area of about 40 acres in a cultivator's field, and an average yield of 293 lbs. of seed cotton per acre was obtained. Though this yield was a good deal better than the average of the local variety in the adjoining fields, the Committee, at its meeting held in August 1940, suggested that this strain should not be distributed on account of its susceptibility to wilt, and that strain R. K. 19 should be tested instead and attempts made at once to produce a wilt-resistant Kumpta type. In January 1942, the Scheme was extended for five years from 28th November 1942. At its meeting in January, 1944, the Committee approved of the release of Raichur Kumpta strain 19 for large-scale cultivation. During 1945-46 this strain was cultivated over an area of 800 acres, and in 1947-48 on 3,000 acres.

In the year under review, seed of six improved strains which were more resistant to wilt in the field than Raichur Kumpta 19 was sent to Poona for trial, but none of them was found promising. As a result of hybridisation, fourteen segregates with fair wilt-resistance in the field have been produced. Of the several back crosses sent to the Plant Pathologist, Poona, for testing under optimum conditions of temperature, humidity and wilt infection, twenty three cultures are reported to be very promising.

Production of selfed seed was continued as part of the work of seed multiplication and distribution of Raichur Kumpta 19 financed by the Hyderabad Government.

BARODA STATE.

Scheme for improvement of Mathio cotton at Amreli.—This scheme has for its object the improvement of *Mathio* mixture in respect of yield, ginning percentage and quality and the trial at Amreli of the early strains of *Wagad* evolved at Viramgam with a view to replacing, if possible, inferior *Mathio* by early *herbaceums*. The scheme came into operation in June, 1937. In January 1942, it was extended for five years from 1st June 1942, and in August 1946, for a further period of 5 years from 1st June, 1947.



Two Improved strains of Mysore American Cotton.

During the year under review, thirty-four progenies of C. 520 x Pratap and its back-crosses were studied in 4 replications. Four promising progenies were selected for further trials. Out of 10 Fs of Pratap x Coimbatore *arboreums* studied in six replications, 4 Fs were found desirable for economic characters. The back-crosses made with these 4 Fs are, therefore, retained for further work. Fresh exploration of *Mathio* mixture was done during the year. It was observed that anything superior to Pratap was a rarity. Fifteen plants (11 for long staple and 4 for high ginning percentage) were selected from this collection for further work.

MYSORE STATE.

Scheme for breeding Sea Island and Egyptian cottons in Mysore.—This scheme, which is an off-shoot of the Mysore (Doddahathi) cotton scheme, was sanctioned by the Committee in January, 1944, for a period of three years from 1st November, 1944, and was extended from 1st November, 1947, in February 1947 for a further period of three years.

It is concerned with (1) the acclimatisation and breeding of Egyptian and Sea Island cottons, and (2) the testing, in large-scale trials, of Mysore-American strains evolved under the Doddahathi scheme.

It is reported that during the year under review, the superiority as regards yield of seed cotton of M. A. V over other American strains including Co.4 was once again confirmed. The sowings done in October, November and December at the Irwin Canal Farm proved more suitable, both from the point of yield and plant growth, than plantings in other months. Giza 12 gave the highest yield in all the sowings and Maarad, which has now been acclimatised, came next. At the Babbur farm, it is stated, no conclusive results regarding the optimum period of sowing have so far been obtained, though there was an indication that June-July sowings were generally good. In the June sowings, Giza 12 is reported to have excelled Giza 7 this year.

In another similar trial, the Sea Island type, S. I. V. 135 was found to respond better to October—November plantings than to September sowings, in which a high mortality of plants was recorded.

It is stated that out of the 40 selections from S. I. V. 135 tested in progeny rows, the twenty three which gave higher yield than the control and possessed long lint and good ginning, were retained for further study.

STUDIES OF PESTS AND DISEASES.

Scheme for investigation of 'small leaf' disease of cotton.—This scheme is an off-shoot of the Mungari Cotton Breeding Scheme. It was sanctioned by the Committee in January 1942, for a period of three years and came into operation on the 1st June, 1943. It was extended in August 1946 for a further period of two years. The extension scheme was put into operation with effect from the 1st September, 1946, and it terminated on the 31st August, 1948. The object of the scheme was to investigate the causes of "small leaf" disease of cotton, and to determine whether or not the disease is of virus origin. The work was carried out at Poona.

During the year under review, experiments on transmission of the virus of "Small Leaf" disease to healthy plants of cotton were carried out at the Government Main Farm, Raichur, through the agency of the undermentioned sucking insects :—

White fly	.. ..	1) <i>Bemisia tabaci</i>
Aphids	.. ..	2) <i>Aphis gossypii</i>
		3) <i>Myzus persicae</i>
Jassids	.. ..	4) <i>Empoasca devastans</i> .
		5) <i>Empoasca</i> Sp.
		6) <i>Eutettix</i> Sp.
Scale insects..	.. ..	7) <i>Pseudococcus</i> sp.
		8) An unidentified <i>membracid</i>

It is stated that 79 plants were inoculated during October, 1947, by the different species of insects mentioned and all the plants were kept under observation till February, 1948. In a few plants inoculated with jassids, smalling of the leaves was noticed in December, but in no case, pronounced symptoms of "Small Leaf" were noticed.

Co-ordinated crop weather scheme.—This scheme was sanctioned by the Committee in August 1946 for a period of 5 years and it came into operation in September, 1947. The object of the scheme is to study the effect of climatic factors on plant growth, crop yield and the incidence of pests and diseases over a series of years at selected experimental farms according to a

common plan. The farms selected for the purpose of this scheme are located at the following stations :—

- | | | |
|-------------|--------------|--------------------------------|
| 1. Kanpur, | 5. Virangam, | 9. Coimbatore, |
| 2. Dharwar, | 6. Nagpur, | 10. Koilpatti, |
| 3. Surat, | 7. Amraoti, | 11. Parbhani (Hydera-
bad), |
| 4. Jalgaon, | 8. Akola, | 12. Indore, |
| | | 13. Baroda. |

The technical programme of the preparatory stage of the scheme in respect of cotton is on the same lines as that for the corresponding schemes sanctioned by the Indian Council of Agricultural Research and the Indian Central Sugarcane Committee. During the preparatory period which is expected to last until March 1949, the initial work relating to the training of the headquarters staff and the observers at out-stations, setting up of the meteorological observatories and the laying out of the crop experiments at these stations, preparation and distribution of technical circulars and standard forms, etc., is to be carried out. Thereafter, all the co-operating stations are expected to start recording the crop and weather data according to the scheme and sending them for analysis to Poona.

The headquarters staff consists of one Assistant Meteorologist, one Assistant and four Computers. Their training in the details of the work and in statistical analysis is being completed shortly.

CHAPTER V.

EXTENSION WORK IN THE PROVINCES AND STATES.

The Seed Distribution and Extension Schemes of the Committee form the real link between the experimental station and the cultivator and in recent years increasing attention has been paid to the development of the extension work with the object of getting the grower to adopt the various improved practices and improved seed evolved as a result of the research schemes of the Committee. The total amount so far spent by the Committee on such schemes amounts to some Rs. 23½ lakhs. During the period under review, there were 13 seed distribution and extension schemes in operation in the various cotton growing Provinces and States. A brief report on the working of these schemes is given below :—

BOMBAY.

(a) **Jarila Seed Distribution and Extension Scheme.**—This scheme was sanctioned in March 1937, for a period of ten months in the first instance. It was extended in January 1938, for a period of one year, in November 1938, for three years and again in July 1941, for a further period of five years. In February 1947 the Committee sanctioned a further extension of two years from the 1st March, 1947. Its original object was to replace *Banilla* in the Khandesh tract with *Jarila*, which is wilt-resistant, over an area of some 155,000 acres. In view, however, of the general suitability of *Jarila* for the Khandesh area, the expansion now aimed at is 8,00,000 acres, out of a total cotton area of 1,100,000. The scheme was operated in five stages of which the first two were the Government Farms at Jalgaon and Bhadgaon. The seed produced at the Jalgaon Farm was used for further multiplication in the wilt-affected regions, and that at Bhadgaon Farm for the wilt-free zone of Khandesh. In January 1943, the Committee approved of the proposal to close down the seed farm at Bhadgaon and to transfer the seed multiplication work being done there to the Jalgaon Farm and the Mamurabad village adjoining it.

Stages I and II.—The selfed seed from the previous year was sown on an area of 23.6 acres on the farm and 4,920 lbs. of seed were obtained for multiplication in stage II. The seed of stage II produced from 98.7 acres was 20,232 lbs. The produce of both stages was ginned in the Farm Gin and the

Seed stock marking.



By Courtesy—I.C.A.R.



lint, which was sold by auction at Jalgaon, fetched Rs. 265/8 per *boja*, i.e., Rs. 601 per *candy* f.o.r. Bombay, against Bombay Jarila quotation of Rs. 509 per *candy* on the same day.

Stages III and IV.—Of the 10,366,070 lbs. of Jarila seed distributed by the Department and approved stockists, 9,366,760 lbs. of seed were utilised for sowing and the balance 999,310 lbs. was handed over to the Revenue Department for feeding purposes. The controlled area during the year was 221,722 acres (including a reserved area of 89,453.5 acres). This acreage, however, fell short of the stipulated area of 550,000 acres by 328,278 acres and the reduction was attributed to the replacement of cotton by food crops on a part of the area and to adverse seasonal factors. The total area under *Jarila* (including natural spread) was estimated at 229,929 acres against 244,297 acres last year.

It is estimated that the growers realised on an average Rs. 23/10 per Bengal maund of *kapas*. In auction sales, premia ranging from Rs. 30 to Rs. 80 over the prevailing Bombay Jarila quotations are said to have been obtained. The *extra income* realised by the cultivators of Jarila was estimated at Rs. 30,46,559 over an area of 229,929 acres, i.e., Rs. 13/4 per acre.

For sowing in 1948-49, the Agricultural Department and approved stockists purchased and stocked 1,561,690 lbs. of seed.

The Cotton Control Act was applied to the whole of Khandesh tract, making Jarila the prescribed variety for the tract. The Cotton Transport Act has been applied to the tract but in so far only as it relates to movement by rail. The question of its application to transport by road is under consideration. It is reported that with the removal of control on movement of cotton seed, there was a large flow of cotton seed into the Khandesh Protected area from adjoining areas of the Central Provinces and Berar both by rail and road. The transport by rail is said to have been brought under control.

(b) **Revised Jayawant and Gadag No. 1 Seed Distribution Scheme.**—This scheme, which was sanctioned in August 1935, for a period of five years replaced five seed schemes in the Southern Division of the Bombay Province, *viz.*, the Hubli, Gadag, Athani, Haveri and Bailhongal schemes. It came into operation on the 1st June, 1936; in August 1940, it was extended for a period of one year and again in July 1941, for a further period of four years from 1st June, 1942. In August 1946, it was further extended up to the

31st May, 1948, and again in March 1948 for a further period of one year up to the 31st May, 1949.

The original object of the scheme was to eliminate local mixtures and to extend pure Jayawant and Gadag No. 1 in the Southern Division of the Bombay Province, over an area of 9½ lakhs acres, within a period of five years. During the extension period of the scheme, it was proposed :—

- (1) to cover an additional area of 425,000 acres with Jayawant and 75,000 acres with Gadag No. 1.
- (2) to carry on intensive propaganda for the cultivation of improved cotton and to check the growing of inferior types ;
- (3) to have Jayawant and Gadag No. 1 pressed under departmental supervision and marketed under 'Agmark' ;
- (4) to make seed distribution work self-supporting by gradually reducing the subsidy on cotton distributed ; and
- (5) to entrust the work of the scheme to efficient co-operative organisations provided the working of the scheme was not adversely affected.

The scheme is operated from eleven centres for Jayawant, *viz.*, Dharwar, Hubli, Nargund, Haveri, Bailhongal, Gokak, Athani, Bagalkot, Hungund, Bijapur and Muddebihal, and from two centres for Gadag No. 1, *viz.*, Gadag and Ron. Decentralisation is the key-note of the scheme, the idea being that no single agency should have too big an area to cover or too great a responsibility to shoulder.

During the year under report, the Department of Agriculture organised a reserve area of 94,980 acres of Jayawant and 21,374 acres of Gadag No. 1, of which 94,044 acres and 20,409 acres, respectively, were rogued. Owing to the 'Grow More Food' campaign, fall in price of cotton and the difficulties of sowing due to continuous rains, all the seed stocked could not be distributed. In all 48,459 bags (60,84,260 lbs.) of Jayawant and 12,580 bags (12,85,000 lbs.) of Gadag No. 1 seed were distributed to cover an area of 515,134 acres and 120,690 acres, respectively. The area under natural spread was estimated at 56,882 acres under Jayawant and 50,320 acres under Gadag No. 1, thus bringing the total area under to 572,016 acres and that under Jayawant Gadag No. 1 to 171,010 acres ; the corresponding figures for the previous year being 667,629 acres and 158,477 acres, respectively.

The produce of both the reserved and general areas amounting to 40,708 *docras* of *Jayawant* and 14,356 *docras* of Gadag No. 1 was sold by auction at an average premium of Rs. 18-2 for *Jayawant* and Rs. 27/5 for Gadag No. 1 per *nag* (1,344 lbs.) of *kapas* over the *bazar* rates.

The original programme was to stock 11,025,700 lbs. of *Jayawant* and 1,675,000 lbs. of Gadag No. 1 seed for sowing in 1948-49, but purchases made up to the 30th April, 1948, amounted to 3,334,520 lbs. of *Jayawant* and 930,600 lbs. of Gadag No. 1.

The agmarking was continued on an optional basis and up to the end of April 1948, 873 bales of *Jayawant* were agmarked. It is believed, however, that unless the millowners show their appreciation of agmarking by paying adequate premiums for agmarked bales over the ungraded cotton, agmarking of cotton will not become popular.

(c) Scheme for cultivation of 1027 A. L. F. cotton in Nawapur Taluka.— This scheme was sanctioned by the Committee in January 1942, for a period of three years and it came into operation on the 4th May, 1942. In January 1945, it was extended for a period of one year. The Committee was informed at that meeting that the total area under cotton in the taluka had decreased from 25,000 acres in 1942-43 to 18,300 acres in 1943-44 and to 16,000 acres in 1944-45 and that, of this, the area covered with pure seed of 1027 A.L.F. distributed by the Department was 10,000 acres. In February 1946, the scheme was further extended from 4th July, 1946, to 31st March, 1947, and in February 1947, for a further period of 3 years from the 1st April, 1947.

The original object of the scheme was to cover an area of 25,000 acres in Nawapur taluka with 1027 A. L. F. cotton. During the 1st extension period, it was proposed to multiply 1027 A. L. F. cotton in the controlled area so as eventually to cover the whole area with this variety. During the present extension it is also proposed to study the results of the comparative trials with *Suyog* and 1027 A. L. F. with a view to selecting the better of the two for cultivation in Nawapur taluka.

A total quantity of 2,23,397 lbs. of seed was distributed during the year by the approved merchants to cover an area of 10,000 acres, of which 3,730 acres are certified. The seed obtained from this area would be sufficient to cover the whole area of Nawapur taluka.

The results of trials of *Suyog* and 1027 A. L. F. conducted in Nawapur taluka indicated that *Suyog* is better in respect of yield and ginning percentage, but inferior in spinning value to 1027 A.L.F. The question of replacing 1027 A. L. F. by *Suyog* has, therefore, been postponed.

The produce of the 1947-48 crop was pooled and marketed by public auction and an average premium of Rs. 3 per *bhar* (924 lbs.) of seed cotton over the local variety was realised. The average selling rate of seed cotton of Nawapur 1027 A. L. F. is stated to be Rs. 372 against Rs. 405 for Surat *Suyog*.

(d) **Scheme for multiplication and distribution of "Vijaya" cotton in Middle Gujerat.**—This scheme was sanctioned by the Committee in July 1943, for a period of five years and it came into operation on the 1st December, 1943.

The object of the scheme is to completely replace local Broach and B.D.8 cottons by *Vijaya* cotton over an area of 5 lakhs acres in the Nerbudda-Mahi and the Mahi-Sabarmati zones of middle Gujerat.

During the year under review, the Agricultural Department controlled a seed multiplication area of 19,349 acres (including 1,294 acres grown with farm pedigree seed) against an area of 20,009 acres (including 2,074 acres grown with farm pedigree seed) in the previous year. The total estimated area under *Vijaya* during the year was 210,600 acres (out of a total cotton area of 246,700 acres) against an area of 184,750 acres in 1946-47. The total quantity of seed distributed by the Agricultural Department was 151,335 lbs. against 1,144,527 lbs. in the previous year. In addition, the Co-operative Cotton Sale and Seed Supply Societies distributed 856,970 lbs. (against 348,980 lbs. of seed in the previous year) to cotton growers in parts of Broach and Kaira districts. The total quantity of seed thus distributed was 1,008,305 lbs. against 1,493,507 lbs. in the previous year; the reduction is attributed to the damage caused by the abnormal rains in April 1947. In all, 5,322 full pressed bales of pure *Vijaya* were obtained from the controlled area, of which 4,550 were sold at a premium varying from Rs. 145 to Rs. 215 per candy f.o.r. Bombay over the March and May Indian Cotton Contract quotations. At the end of the season, 772 full pressed bales remained on hand. These are reported to have been held back in expectation of higher prices. The marketing of *Vijaya* cotton during the season was quite easy due to its good quality and the rising prices brought about by the scarcity of staple cottons in the Indian Union.

Moreover, the premium obtained by 1027 A. L. F. cotton was not sufficient to compensate for its lower ginning outturn, and consequently *Vijaya* seed cotton from the general area was readily purchased by ginowners at a premium of Rs. 20 to Rs. 30 per *bhar* over 1027 A. L. F. cotton grown in the tract.

(e) **Scheme for multiplication and distribution of Kalyan (K. 72-2) cotton in Ahmedabad district.**—This scheme was sanctioned by the Committee in February 1947 for a period of five years and it came into operation on the 1st April, 1947. The object of the scheme is to replace completely Wagotar cotton by Kalyan variety over an area of 330,000 acres in the Wagad tract of Ahmedabad district, comprising the talukas of Viramgam, parts of Sanad, Dholka, Dhandhuka and Deskroi.

During the year under review, the total available quantity of 36,200 lbs. of Kalyan cotton seed was distributed to cover an area of 1,914 acres against 995 acres programmed for.

Stages II and III were organised at Viramgam over an area of 12½ and 129.4 acres, respectively. The produce of these two stages was purchased and ginned under departmental supervision. The *kalas* (dry bolls with seed cotton) of stages IV and V were purchased by the approved agents.

384,000 lbs. of cotton seed were expected to be produced in the season 1947-48, of which some 348,000 lbs. are proposed to be distributed for sowing over an area of 17,500 acres during the year 1948-49 against 7,945 acres originally programmed for. The remaining 36,000 lbs. of seed would be kept as reserve material for emergent use.

About 750 bales of *Kalyan* cotton were expected to be produced during the season under report and the bales which have been sold to the mills at Ahmedabad up to the date of reporting are stated to have realised a premium of Rs. 30 to Rs. 50 per bale over local *Wajad*. On this basis, the growers of *Kalyan* cotton are said to have realised an extra income of Rs. 16,750.

(f) **Scheme for multiplication and distribution of Suyog cotton in Surat tract (South of river Nerbudda).**—This scheme was sanctioned by the Committee in July 1944 for a period of five years and it came into operation on the 1st April, 1945.

The object of the scheme is to replace 1027 A. L.F. and 1A cottons by *Suyog* over an area of 2 lakhs acres in the Surat tract of Bombay Province, lying South of the river Nerbudda, excluding Nawapur taluka of West Khandesh district.

During the year under report, the Agricultural Department controlled an area of 49,165 acres (against 33,562 acres in the previous year), out of which, the produce of 47,170 acres was certified and agmarked. A total quantity of 1,168,282 lbs. of *Suyog* seed was distributed (against 1,021,181 lbs. in 1946-47) including 12,573 lbs. from the Government Farm at Surat. The number of pressed bales of certified *Suyog* cotton was 14,432 (against 8,809 in the previous year) of which 263 were agmarked with red lables (Pedigree) and 14,169 with black labels (Agmark certified). 14,229 bales were disposed of at a premium ranging from Rs. 10 to Rs. 80 per candy, leaving only a small balance on hand at the end of the year.

CENTRAL PROVINCES AND BERAR.

Scheme for distribution and marketing of *Jarila* cotton in Central Provinces and Berar.—A small scheme for the distribution of *Jarila* seed, sufficient for 1,000 acres each in 17 *tahsils* and for roguing the area thoroughly, was sanctioned by the Committee in January 1943, for a period of one year. It came into operation in September 1943. The present scheme was sanctioned in January 1944 for a period of three years from the 1st March, 1944. In November 1947, it was extended for a period of two years. Its object is to arrange for the distribution of pure seed of *Jarila* in Berar, excluding the Pusad *talug*, covering an area of two lakhs acres.

During the year under report, the Department of Agriculture distributed 9,983 maunds of pure seed of stages III, IV, V and VI to cover an area of 66,313 acres against 22,082 maunds to cover 91,728 acres in the previous year. The reduction in acreage is attributed to (1) the susceptibility of *Jarila* to the vagaries of monsoon and particularly to late rains and (2) the decrease in the premia paid for *Jarila* over local or *Oomras* type.

A total quantity of 14,681 maunds of seed of various stages has been stocked for distribution in the ensuing year and is expected to cover 78,300 acres.

The marketing of *Jarila* was done through the pool organisation, which received during the year 1,156 bales for disposal, against 2,817 in the previous

year. The average premium obtained over the Indian Cotton Contract price was Rs. 68-6, and the gross extra income realised by the growers of Jarila from 1,233,417 acres was estimated at Rs. 35,71,054 against Rs. 62,65,576 from 1,387,684 acres in 1946-47.

MADRAS.

(a) **Scheme for maintenance of nucleus of pure seed of improved varieties of cotton in Madras Province.**—This scheme was sanctioned by the Committee in January 1938 for a period of five years and came into operation on the 12th September, 1938. In July 1943, it was extended for a further period of five years for the maintenance of nucleus of the four strains, Co.2, Co.4, K.1 and N. 14. In November, 1947, it was again extended for five years for the maintenance of nucleus of the five strains, Co.2, 4706, Co.3, H.1 and N. 14.

The 'selfed' area of each variety and the quantity of 'selfed' seed produced during the year are given below :—

Name of variety.	Area 'selfed.'	Quantity of 'selfed' seed produced.	Proposed disposal of seed.
	Acres.	lbs.	
Co.2.	1.5	233	For Central Farm sowings and for inner seed farm at Tiruppur in 1948-49.
Co.4.	1.0	65	For sowing in the inner area in Ramnad district in 1948-49.
N.14.	2.0	130	For sowing in multiplication blocks at the Nandyal station in 1948-49.

(b) **Scheme for multiplication and distribution of C. 11-2 cotton in Coimbatore district of Madras Province.**—This scheme was sanctioned in August 1946 for a period of three years. It came into operation on the 1st July, 1946. The object of the scheme is to extend the cultivation of the improved strain C. 11-2 over an area of one lakh acres in the rainfed region of Coimbatore district.

During the year under review, the total available quantity of 94,883 lbs. of seed was distributed to cover an area of 5,249 acres. The extension of the

variety was adversely affected by the inadequacy and late arrival of sowing rains. Droughty conditions persisted after sowing and adversely affected the cotton crop in general, but it was observed that C-11-2 was appreciably resistant to them.

Owing to the non-functioning of the Cotton Market Committee at Tiruppur, the lint produce had to be disposed of to the dealers directly at the best available rates. About 58,800 lbs. of lint (approximately 150 bales) were sold up to July 1948 against 70,425 lbs. (approximately 180 bales) during the previous season. A premium of 6% over local variety was said to have been realised, and it is estimated that the growers earned an extra income of Rs. 52,490 from an area of 5,249 acres or Rs. 10 per acre.

BARODA STATE.

(a) Scheme for creation of a pure Wagotar cotton zone in Mehsana district in Baroda State. This scheme was sanctioned by the Committee in July 1945 for a period of 2 years and 7 months. It came into operation on the 1st January, 1946, and terminated on the 31st July, 1948.

The object of the scheme was to cover the whole of the closed boll tract of Mehsana district, extending over 54,000 acres, with *Wagotar*, a strain of *herbaceum* cotton developed by the Department of Agriculture, Bombay, at its research station at Viramgam.

During the year under report, 857,850 lbs. of *Wagotar* seed were distributed by the Department for sowing an area of 40,400 acres. Of this area, 1,893 acres (25 acres of nucleus seed, 186 acres of A grade and 1,682 acres of B grade) were controlled by the Department. In comparison with the local cotton grown in adjacent areas, the *kapas* of *Wagotar* sold dearer by Re. 0-8 per standard maund.

(b) Scheme for distribution and multiplication of Vijaya cotton in Baroda State.—This scheme was sanctioned by the Committee in January 1944 for a period of five years and it came into operation on the 1st April, 1944. It aims at the replacement of B. D. 8 cotton by Vijaya over approximately 300,000 acres in the black soil areas of Baroda State.

During the year under report, the Department of Agriculture sold 3,590,595 lbs. of seed to cover 226,463 acres, representing the total area under cotton in the tract. Of this, 40,874 acres (5,383 acres of A grade and the balance of B grade) were under Departmental control. The total quantity

of seed cotton pooled by the Department amounted to 1,79,544 maunds and that sold by cotton sales societies and unregistered groups of growers amounted to 70,116 maunds. Up to June 1948, 6,258 bales had been given Agmark labels by the Department. A further lot of 2,860 bales from the pooled produce of the cotton sales societies and unregistered groups of growers was also agmarked. The premium obtained for certified *kapas* over non-certified seed cotton was Rs. 5 per *bhar* of 924 lbs. and that for certified lint, Rs. 10 per candy of 784 lbs. over non-certified lint.

It is estimated that the farmers growing Vijaya cotton on an area of of 226,463 acres earned an additional income of Rs. 92,84,983 in comparison with what they would have earned if they had grown the ordinary B. D. 8 cotton.

(c) **Scheme for distribution of Suyog cotton seed in Navsari district of Baroda State.**—This scheme was sanctioned by the Committee in January, 1945, for a period of five years. It came into operation on the 1st April, 1945. The scheme aims at the replacement of 1027 A. L. F. by *Suyog* over the whole of Navsari district.

During the year under report, the Department of Agriculture, Baroda, sold 1,495,495 lbs. of controlled seed, covering a total estimated area of 149,615 acres, against, 2,168,030 lbs. of seed covering 160,000 acres in 1946-47. Of the total area sown, 19,118 acres (2,060 acres of 'A' grade and the remainder of 'B' grade) were under Departmental control. 68,734 maunds of cotton were pooled and 2,397 bales were agmarked up to the date of reporting. The premium realised by agmarked bales over non-certified cotton was Rs. 40 for red labelled (Agmark Pedigreed) and Rs. 15 to Rs. 30 for black labelled (Agmark certified) cotton.

The total extra income earned by the cultivators of *Suyog* is estimated at Rs. 11,68,867 from an area of 149,615 acres or Rs. 7/13 per acre.

MYSORE STATE.

Scheme for multiplication and distribution of Sel. 69 and M. A. V. in Mysore.—This scheme was sanctioned by the Committee in January 1945 for a period of 5 years. The scheme came into operation on the 1st June, 1946. The object of the scheme is to extend the cultivation of (i) Sel. 69, an improved Asiatic cotton, in the black soil tract of the State covering an area of about 64,000 acres and (ii) Mysore-American, M.A.V, in the red soil

tract extending from 16,000 to 20,000 acres, under rainfed and irrigated conditions.

The seasonal conditions during the year under review were not favourable for cotton cultivation.

Sel. 69.—Ten pounds of selfed seed obtained from an area of 1 acre were utilised to raise a pure nucleus crop at the Babbur Farm. In all 20 lbs. of seed were obtained for the next stage of multiplication. The area under Sel. 69 during the year was said to be 60 acres only.

M.A.V.—In collaboration with the Co-operative Marketing Society Arasikere, 70,000 lbs. of bulk seed were distributed, and an area of 3,000 acres against 1,200 acres in the previous year, was covered. Up to the date of reporting, a quantity, of 98,500 lbs. of seed had been collected and another 50,000 lbs. was expected to be collected for distribution in the following season. M. A. V fetched a price of Rs. 10/12 per maund of 28 lbs. *kapas* against Rs. 9/6 per maund obtained by the local variety at Arasikere. The corresponding prices realised at Davangere were Rs. 12/2 and Rs. 9/8 per maund, respectively.

CHAPTER VI.

PROGRESS IN THE INTRODUCTION OF IMPROVED VARIETIES OF COTTON.

The area under improved varieties of cotton in the Indian Union during the year under review was estimated at 5,148,000 acres or 47% of the total cotton area as compared with 5,249,000 acres or 45% of the total area in the previous year. The improved varieties in cultivation were mainly of medium and long staple types in accordance with the policy of the Committee to increase the production of such cottons. The extent to which the average staple of the crop during the past quarter of a century has been improved as a result of this policy, which was carried out in collaboration with the Provincial and State Departments of Agriculture, is illustrated in the table below :—

TABLE I.

Year. (1st September to 31st August).	Production.			
	(In thousand bales of 400 lbs. net).			
	Long and medium staple ($\frac{7}{8}$ " and above).	Short staple (below $\frac{7}{8}$ ").	Total all staples.	Percentage of Col.2 to Col.4.
1	2	3	4	7
1922-27 (Av)	1,622	3,827	5,449	30
1927-32	1,327	3,879	5,206	25
1932-37	1,650	3,665	5,315	31
1937-42	2,117	3,480	5,597	38
1942-47	2,649	1,478	4,127	64

The above figures relate to undivided India and it will be seen that the proportion of cotton of staple length $\frac{7}{8}$ " and above to the total production increased from 30% in the quinquennium 1922-27 to 64% in the quinquennium

1942-47. The sudden jump to 64% in the last quinquennium was due partly to the deliberate diversion of a large area of short staple cotton to food crops and partly to the substitution of medium and long staple varieties for inferior types of cotton. On the commencement of World War II, and more particularly after the start of hostilities with Japan, the exports of short staple cotton were virtually cut off and cotton of this type became a drug on the market.

As a result of the partition of the country in August, 1947, to which reference is made in Chapter II of this report, the acreage under cotton in the Indian Union was greatly reduced (Cotton Map India). The table below shows the production of cotton in the Indian Union classified according to staple lengths ' $\frac{3}{8}$ " and above' and 'below $\frac{3}{8}$ " for the year 1947-48 with corresponding figures for 1946-47 for purposes of comparison. It may be added here that the figures given in this table are based on the revised classification as explained in Chapter III of this report.

TABLE 2.

Year. (1st September to 31st August).	Production.			
	(In thousand bales of 400 lbs. net).			
	Long staple ($\frac{3}{8}$ " and above).	Medium and short staple (below $\frac{3}{8}$ ").	Total all staples.	Percentage of Col.2 to Col.4.
1	2	3	4	5
1946-47	409	1703	2112	19
194748	386	1730	2116	18

The proportion of cotton of staple length $\frac{3}{8}$ " and above (now termed as long staple) to the total production thus formed 18% during the year under report against 19% in the previous year.

It is worthy of note that the improvement in the quality of cotton has been accompanied by a not inconsiderable rise in the yield per acre of cotton. This will be evident from the following table in which two sets of figures of

yield, one based on the official crop forecasts and the other on the figures of actual crop calculated from cotton pressed, unpressed cotton consumed in mills, extra-factory consumption etc., are given :—

TABLE 3.

Period. (Year 1st September— 31st August).	Area (Thousand acres).	Production. Government estimates (Thousand bales of 400 lbs. net.)	Yield per acre (lbs) Col.3 Col.2.	Approximate commercial crop. (Thou- sand bales of 400 lbs. net.)	Yield per acre calcu- lated from approximate commercial crop. (lbs.) Col. 5 Col.2.
1	2	3	4	5	6
Average 1922-27 ..	24,723	5,449	87	*5,954	96
„ 1927-32 ..	24,738	5,208	84	*5,851	95
„ 1932-37 ..	23,912	5,315	89	*6,447	108
„ 1937-42 ..	23,656	5,597	95	†6,457	109
„ 1942-47 ..	16,932	4,127	97	†4,793	113
§ 1947-48 ..	10,932	2,116	77	‡3,190	117

* Calculated from mill consumption (mill consumption in Burma included up to 31st March, 1937) plus exports (Exports from Burma included up to 1934-35) plus extra factory consumption (the figure of 450,000 bales for the whole of India, based on enquiries conducted by the Committee in selected areas, has been used throughout). Variation in stocks has not, however, been taken into account.

† Best estimates of the crop as arrived at by the Indian Central Cotton Committee in connection with the annual post-mortem examination of all India cotton forecasts.

‡ Provisional.

§ Relates to the Indian Union.

Although the figures given in column 6 indicate a progressive improvement in the average yield per acre of the crop, there is still much scope for improvement in this direction and measures to achieve the end in view are under the active consideration of the Committee.

The main principle adopted by the Committee in making its recommendations for the spread of improved varieties of cotton is the extra income to the grower, and on the basis of the data furnished by Provinces and States in respect of the improved varieties for the extension of which seed distribution

schemes have been put into operation with the aid of funds provided by the Committee, it is estimated that the additional benefit accrued to the growers of improved varieties of cotton during 1947-48 was about 5.0 to 5.5 crores of rupees in the Indian Union.

The progress made in the introduction of improved varieties of cotton in the major cotton growing Provinces and certain Indian States is dealt with below :—

BOMBAY PROVINCE.

(^F The total estimated area under cotton in the Province during 1947-48 was 1,663,087 acres.

Broach Tract :—

Out of the total area of 226,696 acres, the estimated area under *Vijaya* cotton was 210,600 acres, against 184,750 acres in 1946-47. Out of a total quantity of 1,008,305 lbs. of *Vijaya* seed handled this year, against 1,493,507 lbs. in the previous year, 151,335 lbs. were distributed by the Agricultural Department, and 856,970 lbs. of seed were directly supplied to the growers by the Co-operative Societies in Middle Gujerat under the supervision of the Agricultural Department.

In all, 5,322 full pressed bales of pure *Vijaya* cotton were produced under Departmental control and disposed of at premiums varying from Rs. 145 to Rs. 215 per Bombay candy f.o.r. Bombay, on the March and May Indian Cotton Contract quotations.

Vijaya cotton has already established its popularity due to its intrinsic quality which accounts for its demand by the trade ever since its introduction. Further, an area of 19,200 acres was sown with *Vijaya* in Chhota Udepur State, the total area under cotton in this tract being 37,217 acres.

Wagad Tract :

Out of the total area of 210,259 acres, the estimated area under *Wagotar* was 188,021 acres.

A scheme for multiplication and distribution of *Kalyan* cotton (an improved variety of cotton superior to local *Wagad*) has been sanctioned by the Indian Central Cotton Committee. 36,120 lbs. of seed of this variety was distributed by the Department to cover an area of 1,914 acres. The distribution of the previous improved type, *Wagotar*, was discontinued.

Khandesh—Jarila Tract.

Jarila cotton, which has been introduced into general cultivation in Khandesh, is superior to local or Banilla in staple and is highly wilt-resistant. Its yield and ginning outturn are equal to those of the local type and it has admirably adapted itself to the conditions of the Khandesh Tract. Jarila is now the established and recognized variety of this Tract and is appreciated both by the cultivator and the trade.

Out of a total area of 237,993 acres, the estimated area under Jarila cotton was 229,929 acres of which 124,187 acres were controlled by the Department. The seed multiplication scheme for Jarila subsidised by the Committee was continued. During the year under report, 9,366,760 lbs. of pure seed of Jarila was distributed by the Department. There was no increase in area owing to adverse seasonal conditions and also to the fact that the cultivator was getting higher monetary return for his groundnut crop compared with what he obtained for cotton. The cotton from controlled area fetched Rs. 30 to Rs. 80 more than the ruling quotations for Jarila in Bombay Market.

The Cotton Control Act as well as the Cotton Transport Act remained in force as in the previous year. No other cotton but Jarila is now grown in the Khandesh Division.

In the Barsi-Nagar tract, there was an approximate area of 17,600 acres under Jarila against the total cotton area of 22,053 acres.

Surat Tract.

Against the total area of 126,869 acres under cotton, the estimated area under Suyog variety was 85,000 acres representing 67% of the total area. The Agricultural Department handled 1,168,282 lbs. of Suyog seed. The produce of the controlled area was Agmarked under the Grading and Marking Scheme and 14,432 agmarked bales of Suyog were disposed of at an average premium of Rs. 26/13 per candy over non-agmarked bales. The quality as well as the staple length of Suyog was maintained as in the past year.

Under the scheme for cultivation of 1027 A. L. F. cotton in the Nawapur Taluka of West Khandesh District, the whole Taluka is now covered with

1027 A. L. F. cotton. The total quantity of seed supplied during the year being 223,397 lbs. In all 514 agmarked bales of 1027 A. L. F. were sold at an average premium of Rs. 54/9 per candy over non-agmarked bales.

Kumpta-Dharwar Tract.

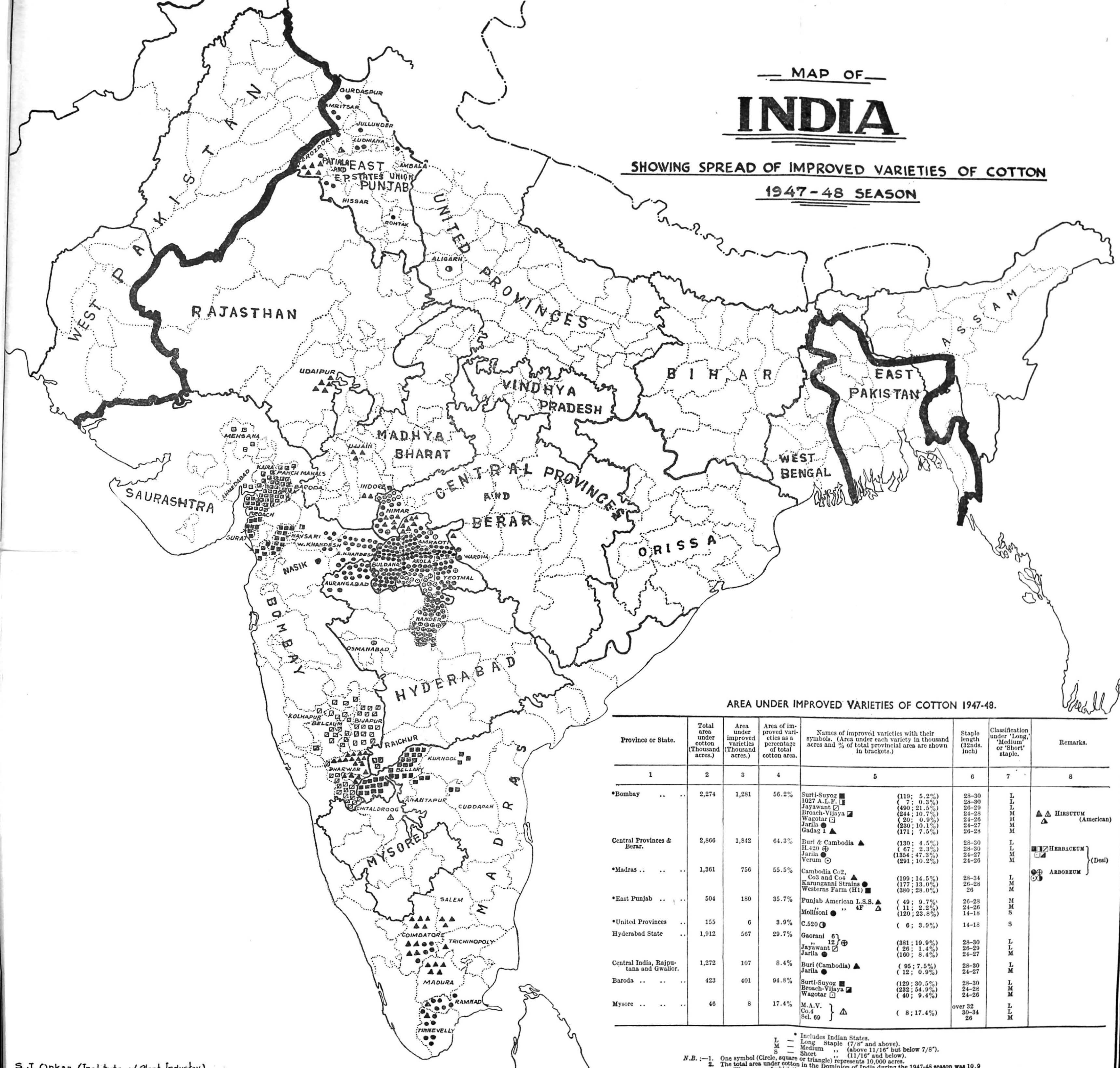
The total estimated area under cotton in the three districts of Dharwar, Belgaum and Bijapur of the Bombay Karnatak, including the Deccan States, for 1947-48 was 800,000 acres. Three improved varieties of cotton have been introduced in this Division by the Department of Agriculture. These are Jayawant (*herbaceum* type), Gadag No. 1, and Cambodia (*hirsutum* types). Jayawant and Gadag No. 1 are grown mainly as rainfed crops. The total estimated area under these improved varieties during 1947-48 was:—Jayawant, 572,016 acres (of which 56,882 acres were under natural spread and 515,134 acres under departmental seed) and Gadag No. 1, 171,010 acres, of which 50,320 acres were under natural spread and 120,690 acres under departmental seed.

Jayawant, which at present occupies the whole of the Kumpta cotton tract of the Bombay Karnatak, was evolved from the bulk Kumpta cotton, previously grown in the tract, with the main object of meeting the then (1930) pressing need of the cotton growers and the textile mills for a variety of cotton, having desirable agricultural and commercial characters such as, long staple, high ginning outturn, finer spinning capacity and resistance to wilt disease etc. The average staple length of Jayawant is $7/8$ ", its ginning outturn varies from 26 to 28% and it spins up to 37's (H. S. W. C.). The cultivation of this improved cotton is concentrated in the whole of the Kumpta Protected area and the major part of the Bijapur District. This cotton is sold at a premium of Rs. 50 to Rs. 100 per Bombay candy over Jarila (Standard cotton) in the Bombay market.

Gadag No. 1 which is a selection from the acclimatised Dharwar-American cotton, occupies the whole of the Dharwar-American cotton tract of the Bombay-Karnatak (Gadag, Ron and parts of the Haveri and Ranebennur Talukas of Dharwar District). The average staple length of this cotton is $13/16$ ", its ginning outturn is 33.8% and it spins up to 33 (H. S. W. C.). It is sold at a premium of Rs. 40 to Rs. 90 per Bombay candy over Jarila (Standard cotton) in the Bombay market.

MAP OF
INDIA

SHOWING SPREAD OF IMPROVED VARIETIES OF COTTON
1947-48 SEASON



AREA UNDER IMPROVED VARIETIES OF COTTON 1947-48.

Province or State.	Total area under cotton (Thousand acres.)	Area under improved varieties (Thousand acres.)	Area of improved varieties as a percentage of total cotton area.	Names of improved varieties with their symbols. (Area under each variety in thousand acres and % of total provincial area are shown in brackets.)	Staple length (32nds. inch)	Classification under 'Long', 'Medium' or 'Short' staple.	Remarks.
1	2	3	4	5	6	7	8
*Bombay	2,274	1,281	56.2%	Surti-Suyog ■ (119; 5.2%) 1027 A.L.F. ■ (7; 0.3%) Jayawant □ (490; 21.5%) Broach-Vijaya ■ (244; 10.7%) Wagotar □ (20; 0.9%) Jarila ● (230; 10.1%) Gadas 1 ▲ (171; 7.5%)	28-30 28-30 26-29 24-28 24-26 24-27 26-28	L L M M M M	▲ ▲ HIRSETUM (American)
Central Provinces & Berar.	2,866	1,842	64.3%	Buri & Cambodia ▲ (130; 4.5%) H.420 ⊕ (67; 2.3%) Jarila ● (1354; 47.3%) Verum ⊙ (291; 10.2%)	28-30 28-30 24-27 24-26	L L M M	■ ⊕ HERBACEUM } (Desi) ● ⊙ ARBOREUM }
*Madras	1,361	756	55.5%	Cambodia Co.2. ▲ (109; 14.5%) Co.3 and Co.4 ▲ (177; 13.0%) Karunganni Strains ■ (380; 28.0%) Westerns Farm (H1) ■	28-34 26-28 26	L M M	● ⊙ ARBOREUM }
*East Punjab	504	180	35.7%	Punjab American L.S.S. ▲ (49; 9.7%) Mollisoni ● " 4F ▲ (11; 2.2%) C.520 ⊙ (120; 23.8%)	26-28 24-26 14-18	M M S	
*United Provinces Hyderabad State	155 1,912	6 567	3.9% 29.7%	Gaorani 6 } (381; 19.9%) " 12 } ⊕ (26; 1.4%) Jayawant □ (190; 8.4%) Jarila ●	28-30 26-29 24-27	L L M	
Central India, Rajputana and Gwalior.	1,272	107	8.4%	Buri (Cambodia) ▲ (95; 7.5%) Jarila ● (12; 0.9%)	28-30 24-27	L M	
Baroda	423	401	94.8%	Surti-Suyog ■ (129; 30.5%) Broach-Vijaya ■ (232; 54.9%) Wagotar □ (40; 9.4%)	28-30 24-28 24-26	L M M	
Mysore	46	8	17.4%	M.A.V. Co.4 } ▲ (8; 17.4%) Sel. 69 }	over 32 30-34 26	L L M	

* Includes Indian States.
L — Long Staple (7/8" and above).
M — Medium " (above 11/16" but below 7/8").
S — Short " (11/16" and below).

N.B. :- 1. One symbol (Circle, square or triangle) represents 10,000 acres.
2. The total area under cotton in the Dominion of India during the 1947-48 season was 10.9 million acres, of which the area under improved varieties comprised 47.1%.

The total quantity of seed of the two improved varieties of cotton distributed by the Department in the year under review is shown below :—

	Quantity of seed distributed. lbs.
1. Jayawant	5,649,670
2. Gadag No. 1	1,635,400

MADRAS.

The average area under cotton in the Madras Province during the five years ending 1944-45 represents 10.7% of the total area under cotton in India.

The total area under cotton in the Madras Province during 1947-48 according to the additional forecast report was estimated at 1,360,900 acres against 1,565,800 acres for the corresponding period of the previous year. The present estimate for the province represents a decrease of 13.8% as compared with the finally recorded area of 1,579,000 acres in 1946-47. The fall in general was distributed in all the districts except Vizagapatam, Bellary, Chingleput and South Arcot where there is an increase. The decrease was marked in Salem, Coimbatore, Madura, Ramnad and Tinnevely. This was mainly due to the failure of rains during the sowing season, i.e., in October and November 1947 and to some extent to the diversion of the areas to groundnut and cholam.

A. Cambodia cotton.—The area under Cambodia cotton during the year was 260,700 acres against 337,700 acres in 1946-47. The improved strains Co.2, Co.3, Co.4, 4463 and 920 continued to be popular and covered an area of 198,847 acres which works out to 76% of the total area under Cambodia, against 86% estimated in 1946-47. Strain Co.2 being very cosmopolitan continued to occupy largest individual area and figured in all the districts growing Cambodia. The area under strain Co.3 decreased by 49% and its cultivation was confined to Salem, South Arcot and Trichinopoly districts. Co.4 recorded a total fall of 3% in area. Its spread was mainly confined to Ramnad, Tinnevely and Madura districts. The last two districts recorded increased acreage during 1947-48 as compared to the previous season. Strain 920 declined in acreage by 72% while 4463 increased by 58% as compared to previous season. The cultivation of these two strains was confined to Coimbatore district only. The extent of the spread of the different varieties is indicated in Table 1.

TABLE I.

Cambodia cotton.

Area as per forecast—260,700

Districts.	Name of strain.	Quantity of seeds distributed by		Total area under the strain inclusive of natural spread. Acres.
		Madras Agricultural Department. lbs.	Co-operative Societies.	
Madura	Co.2	29,400	....	46,740
Ramnad .. .. .	"	....	....	1,200
Tinnevelly	"	2,352	....	2,095
South Arcot	"	224	....	2,152
Salem .. .. .	"	....	....	13,750
Coimbatore	"	4,10,490	....	82,300
Trichy .. .. .	"	....	....	6,272
Malabar	"	1,274	....	1,300
Ananthapur	"	196	....	100
Kurnool .. .. .	"	....	....	224
North Arcot .. .. .	"	....	....	80
	Total ..	4,43,936	..	1,56,213
South Arcot	Co.3	1,000	....	470
Salem	"	8,823	59,500	11,850
Trichy .. .. .	"	....	....	1,000
	Total ..	9,823	59,500	13,320
Madura	Co.4	....	....	3,000
Ramnad	"	46,479	....	9,985
Tinnevelly	"	6,302	....	4,210
South Arcot	"	2,800	95	825
Chingleput .. .. .	"	....	....	20
	Total ..	55,581	95	18,040
Coimbatore	920	....	....	4,704
Coimbatore	4463	16,284	....	6,570
GRAND TOTAL		5,25,624	59,595	1,98,847

The agencies which multiplied and organised the sale of pure seeds were (1) The Madras Agricultural Department for Co.2, Co.3, Co.4 and 4463 (2) The co-operative Sales Society at Tirupur for Co.2 (3) The Co-operative Society at Salem for Co.3.

B. Tinnevellys.—The total area under Tinnies recorded during the year 1947-48 was 4,08,400 acres against 5,40,700 acres as per additional forecast report of 1946-47 indicating a reduction of 24%. The estimated acreage of 1,77,104 acres under the improved Karunganni strains, vide Table II works out to 43% of the total Tinnevellys as against the same percentage recorded last year. The new and improved strain 4706 renamed as K2 which has the merit of suffering less shedding than K1 under unseasonal rains in addition to being of better quality was distributed to a small extent during the year in Tinnevelly district pending the launching of a separate seed distribution scheme. Strain C.11-2 renamed as Co.5 showed an increase in acreage by 44% as compared to last season largely due to the working of a scheme to multiply and distribute the seed on a large scale at Palladam in Coimbatore district.

TABLE II.

Tinnies : Area as per forecast 4,08,400 acres.

District.	Name of strain.	Quantity of seed distributed by		Total area under the strain inclusive of natural spread acres.
		Madras Agricultural Department.	Co-operative Societies.	
Tinnevelly	K1	1,800	1,18,200	66,801
Madura .. .. .	"	....	....	4,500
Ramnad	"	39,205	6,250	57,713
Coimbatore .. .. .	"	....	....	27,640
Total ..	..	41,005	1,24,450	1,58,654
Tinnevelly	K2	1,524	....	150
Coimbatore	Co5	1,16,900	....	20,300
GRAND TOTAL ..	..	1,59,429	1,24,450	1,77,104

C. **Salems.** The area under the "Salems" decreased to 9800 acres during 1947-48 against 12,600 acres estimated in the additional forecast report of 1946-47. Improved strain Co.5 will be arranged to be distributed in the Trichinopoly district from 1948-49 onwards to replace the inferior types of cotton now grown.

D. **White and Red Northern.**—There was a fall during the year to 67,000 acres from 75,500 acres recorded last year. N14 was the only strain grown over an area of 1350 acres occupying 2% of the total area under white and Red Northern. The spread of the strain is limited due to want of proper organisation for multiplication and distribution of the seed.

TABLE III.

Northern. Area as per forecast 67,000 acres.

District.	Name of strain.	Quantity of seed distributed by		Total area under the strain inclusive of natural spread acres.
		Madras Agricultural Department.	Co-operative Societies.	
Kurnool	N14	....	....	13,50

E. **Westerns.** The estimated area in 1947-48 was 5,01,000 acres against 5,18,050 acres estimated in 1946-47 as per additional forecast. The area under the improved strain H1 was estimated at 3,79,545 acres which works out to 76% of the total area under the westerns and an increase of 3% over the last year's acreage.

TABLE IV.

Westerns. Area as per forecast 5,01,000 acres.

District.	Name of strain.	Quantity of seed distributed by		Total area under the strain inclusive of natural spread acres.
		Madras Agricultural Department.	Co-operative Societies.	
Anantapur	H1	47,970	....	34,200
Cuddapah	"	66,170	....	16,280
Bellary	"	1,48,175	13,000	2,97,115
Kurnool .. .. .	"	....	....	31,950
Total .. .. .	..	2,62,315	13,000	3,79,545

F. Warangal and Cocanadas. The estimated area under this variety of cotton was 83,900 acres, compared to 77,800 acres during 1946-47. Strain x20 renamed G1 (Guntur 1) a hybrid strain between two cocanadas cotton was found to be suitable for the tract. Its spread was confined to 236 acres in the districts of Guntur and West Godavari. An increase in the area under this strain is expected in future with the aid of a seed distribution scheme running at Guntur.

TABLE V.

Warangal and Cocanadas. Area as per forecast 83,900 acres.

District.	Name of strain.	Quantity of seeds distributed by		Total area under the strain inclusive of natural spread acres.
		Madras Agricultural Department.	Co-operative Society.	
Kurnool			
Guntur	21	....	216
West Godavari	200	....	20
Total	221	....	236

CENTRAL PROVINCES AND BERAR.

The total area under cotton in the province during the year 1947-48, was 2,910,350 acres (actuals) as against 2,966,719 acres (actuals) of last year. There has been a small decrease in the area, which can be attributed to the general trend of lower prices dominating throughout the season 1946-47 and partly due to the unfavourable season.

VERUM 434:—

The area under Verum 434 was 387,768 acres against 325,775 acres of last year. The strain possesses fine strong staple about 7/8" in length and is capable of spinning up to 30's H. S. W. C. The area under this variety is distributed all over the province. The departmental spread is mostly concentrated in Pusad, Basim, Murtizapur and Amraoti *taluqs* of Berar and Khandwa and Harsud *talhsils* of Nimar districts in the Central Provinces. 6561 mds. of seed was distributed for sowing purposes through the departmental, co-operative and other agencies.

BURI 107:—

The total area under this variety in the different parts of the province was 45,096 acres against 52,682 acres of last year. This strain possesses fine staple, about 1" in length and is capable of spinning upto 40's H. S. W. C. The area under this variety is mostly concentrated in Nimar district. 1353 mds. of seed was distributed for sowing purposes in the province by the department.

EAST PUNJAB.

The total area under cotton in the East Punjab was estimated at 3,15,000 acres. Of the total area 2,49,900 acres were grown under *desi* cottons and 65,100 acres under American varieties. The American varieties thus constituted about 21% of the total East Punjab cotton crop. The following estimated area was under the improved cottons:—

		<i>Areas where cultivated.</i>
4 F	11,339 acres.	Ferozepore
L. S. S.	48,510 "	"
216 F	302 "	Hissar
39 Moll-M 60 A2	1,02,774 "	Jullundur, Hoshiarpur, Ferozepore, Hissar.

4F.—A selection of acclimatized Punjab-American characterised by dwarf stout plants of rather bushy habit. Its leaves and stems are profusely hairy. Grown mostly in Ferozepore District.

Particulars of the variety are :

Staple length	.. ..	.76"
Ginning percentage	.. ..	32.5%
Highest standard warp counts	..	22

L.S.S.—This is a selection made from 4F but differs from that variety in having more bushy plants. Semi-naked seeds with white fuzz and longer staple (suitable for Ferozepore District)

Particulars of the variety are:—

Staple length	.. ..	.88"
Ginning percentage..	.. ..	33.0%
Highest standard warp counts.	..	40

216F (Haryana).—This is an early ripening variety of American cotton giving first picking at the same time as *desi* cotton. The plants are profusely hairy and are highly resistant to Jassids. The variety has been found suitable for cultivation in the irrigated areas of Hissar, Rohtak and Gurgaon Districts.

Particulars of the variety are :—

Staple length	.. .. .	.90"
Ginning percentage..	.. .. .	33.0%
Highest standard warp counts	.. .. .	35

39 Mollisoni. This is a high yielding variety of *desi* cotton best suited for cultivation in Ferozepore and Amritsar Districts.

Particulars of the variety are :—

Staple length	.. .. .	.72"
Ginning percentage..	.. .. .	35%
Highest standard warp counts	.. .. .	8

M 60 A2. This improved variety of *desi* cotton is well adapted for cultivation in the whole of South-Eastern tracts of the Province, consisting of the districts of Hissar, Rohtak, Karnal, Gurgaon and part of Ambala.

Particulars of the variety are :—

Staple length	.. .. .	.60"
Ginning percentage..	.. .. .	38 to 40%
Highest standard warp counts	.. .. .	6

SEED DISTRIBUTION BY THE DEPARTMENTS.

Due to the disturbed conditions prevailing in all the districts of the East Punjab in 1947-48, normal work of seed distribution could not be carried out. Only the following quantities of pure seed could be distributed :—

Variety.	Weight in maunds.	Area sown in acres.
216 F	316 Maunds.	1475 acres.
4F		
L. S. S.	400 „	2000 „

UNITED PROVINCES.

Owing to the late monsoon in the majority of the districts, the cotton sowings commenced somewhat late. During the growing period of the cotton crop, there was more even distribution of rainfall so that weeding and other cultural operations could be generally carried out normally. The crop was medium to good all over the province except in the Bundelkhand Circle where it was stunted in growth on account of incessant and heavy rain.

The total area under cotton this year was 1,51,811 acres against 1,68,170 (revised) last year, showing a decrease of 9.7 per cent. As compared with the average areas of the preceding five and ten years, the area during the year under report shows decreases of 49.7 and 64.8 per cent, respectively.

The outturn of the crop was estimated at 41,000 bales (rounded) of 400 lbs. each against 43,800 bales (rounded and revised) last year, showing a decrease of 2,800 bales (rounded) or about 6.3 per cent. The estimated production of cotton this year is stated to have fallen short even of the usual requirements for village consumption.

IMPROVED VARIETIES.

The position regarding improved varieties in the province has further deteriorated. After the closing down of the Perso-American Seed Distribution Scheme, there is now no scheme under which improved varieties, either Perso-American or *desi* are being propagated. The following table gives the area, etc., under the improved varieties for the year 1947-48 :—

Variety.	Total area in acres.	Quantity of seed distributed.	Area where the variety is chiefly concentrated.
All cotton	1,51,811	....	....
C.520	6,263	Non Departmentally.	Etah, Mainpur, Aligarh, Mathura and Bulandshahr.
P. Am.	1,378	„	Meerut (Hapur and Ghaziabad) Bulandshahr, Aligarh, Mathura, Etah (Kasganj) and Agra.

CHIEF CHARACTERISTICS OF THE IMPROVED VARIETIES.

C. 520 cotton is a pure line selection of "roseum" type isolated from the U. P. Bengals material collected in Saharanpur and Bijnor districts in 1920-21. It yields high under both irrigated and unirrigated conditions. When grown on a commercial scale at the Government Cotton Research Farm, Raya (Mathura), the variety yields about 9 to 10 maunds of *kapas* per acre. This variety has an average staple length of 0.72 inches, gins about 35-37 p.e., and is capable of spinning up to 10—12-1/2 highest standard warp counts.

The variety had spread fairly wide in the cotton areas, but now owing to general decline in cotton cultivation due to high prices of food grains, its area also has gone down. It had also taken a good hold in some of the Central Indian States, Baroda, Rajputana and in some areas in the Eastern part of the Punjab. The *kapas* of this variety is valued at about 0-8-0 per md., more than that of the ordinary *desi* under normal trade conditions.

PERSO-AMERICAN COTTON.

It is a selection from the American types of cotton originally imported from Persia (Iran) and acclimatised in the United Provinces. When grown on a commercial scale at Raya and other suitable areas, e.g., Budaun, it yielded up to 13-14 mds. per acre. This variety has an average staple length of 0.85", gins 30-32 per cent., and is capable of spinning up to 28 to 34 highest standard warp counts. The *kapas* of this variety ordinarily fetches a premium of Rs. 1-8-0 to Rs. 2 per maund over *desi* in normal times. During the previous year, the extension scheme financed by the Indian Central Cotton Committee was closed after the sowing season.

HYDERABAD.

The total area under cotton in the State during 1947-48 was 1,912,000 acres.

The area under improved varieties together with a short history of each and the quantity of seed of each distributed by the Agricultural Department is given in the following table :—

Name of variety.	Description.	1947-48.		Remarks.
		Quantity of seed distributed.	Area actually sown.	
Gaorani 6.	A selection made in 1929 from Hyderabad Gaorani in Bhainsa in Nanded district. An early maturing, fair yielding type with a staple length of 0.85 inch and ginning percentage of 32; capable of spinning 36's highest standard warp counts. It is under large scale cultivation and is specially suited to the north and north-eastern parts of the Gaorani Protected Area.	<i>lbs.</i> 51,25,561	<i>acres.</i> 2,56,272	Mostly confined to Nanded district.

Name of variety.	Description.	1947-48		Remarks.
		Quantity of seed distributed.	Areas actually sown.	
Gaorani SE-3.	A substrain of Gaorani 6 with a mean staple length of 0.85 inch, ginning percentage of 32, capable of spinning 35-40's highest standard warp counts.	3,14,650	15,732	Nanded taluqa.
Gaorani 12.	An earlier maturing reselection from Gaorani 12F which is as resistant to wilt in field as the parent. It has a staple length of 0.85 inch, ginning percentage of 32 and can spin 30's-35's highest standard warp counts.	1,59,250	9,950	Latur and Kallam taluqas of Osmanabad District and Udgir and Ahmedpur taluqas of Bidar district in the South - Western Gaorani Protected Area.
Raichur Kumpta 19	A selection from the local Kumpta crop of Raichur district. It is a good yielding drought and wilt-resistant variety with a staple of 0.81 inch, ginning percentage of 29-30 and is capable of spinning upto 24's highest standard warp counts.	88,768	2,913	Raichur taluqa of Raichur district.
Jaywant.	It is a segregate of a cross between Dharwar I and Dharwar II with a staple of 0.89 inch and ginning percentage of 28. It is capable of spinning 32-34's highest standard warp counts. It appears to be well suited to the western half of Raichur district.	72,189	7,219	Gangawati and Kopbal taluqas of Raichur district.

BARODA.

The total area under cotton in Baroda State during the year 1947-48 was 4,22,674 acres, distributed as follows :—

Baroda	.. .. .	2,31,658 Acres.
Navsari	.. .. .	1,29,389 "
Mehsana	.. .. .	55,362 "
Amreli	.. .. .	6,265 "

2. **Vijaya Cotton.**—This cotton covers the whole of Broach cotton tract lying in Baroda State between the two rivers, Narbada and Sabarmati. On account of its being grown in a high state of purity over an extensive area Vijaya has re-established the high reputation of Broach Cotton.

Suyog Cotton.—Suyog has practically covered the whole of the Surti tract in Baroda, i.e., the area lying South of the river Narbada. It was observed that Suyog stands up to water-logging brought about by incessant rains during monsoon and this is a very strong point in its favour, as the Surti tract is liable to heavy and continuous down pour.

Wagotar.—This cotton was introduced into the Wagad or closed boll tract of Baroda which extends from the Sabarmati river northwards; its cultivation is restricted to the Kadi and Kalol talukas. The area under this was 50,000 acres. From the year 1947-48 a new strain Kalyan, (K 72-2) has been introduced to replace Wagotar; an area of 23 acres was covered by it during the year under report.

3. The statements below show

(a) The area controlled by the Department.

	Vijaya Acres.	Suyog Acres.	Wagotar. Acres.
S. F. seed	4	2	1
Nucleus seed	36	25	25
Grade A seed	5383	2060	186
Grade B seed	35491	17058	1682
Grade C seed .. ..	..	..	38506

and (b)

the Quantity of seed distributed.

Vijaya	35,90,595 lbs.
Suyog	14,95,495 „
Wagotar	8,57,850 „

RAJPIPLA STATE.

The Rajpipla Cotton Improvement Act of 1921 has prohibited the import and sowing of Ghoghari or any other short staple cotton. The export likewise of cotton by rail or by boat is entirely prohibited except in the form of fully pressed bales, an exception being made only in favour of bona-fide *kheduts*

who are allowed to take their cotton in carts for sale outside the State. Best cotton seed of the 1027 A. L. F. variety is supplied by the State to the *Khedut* and only the long staple cotton of this strain is grown throughout the State. The cotton growth in the State has attained a high standard of reputation on account of its purity and finds ready customers in the market.

During the year under report the best seed was supplied as usual by the State to the cultivators.

The total area under cotton cultivation throughout the State was about 81,017 acres while the total output of the season was 26,591 bales pressed within the State and about 2,429 bales more, pressed outside the State limits from the cotton transported in cart by some cultivators of the outlying areas for sale outside the State.

The reduction in the production of cotton crop was mainly due to the "Grow More Food" campaign rigorously followed in the State.

MYSORE.

The total area under cotton of long, medium and short staples in the province is estimated at 68,600 acres during the year 1947-48 season. Of this area 3,000 acres were under the improved long staple M. A. V. cotton and 60 acres under medium staple cotton selection 69.

M. A. V.—This is a long staple cotton evolved in recent years under the Mysore Doddahatti Cotton Scheme of the Indian Central Committee and is increasing in popularity as a high priced fine cotton. This type seems to be well suited to the red loamy soils of the State and can be grown with equal facility both under rain-fed and irrigated conditions. Trials to examine its performance in the black soil tracts, have shown promising indications that this cotton is equally well suited to these soils, the only limitation being the time of sowing to be concurrent with that of the medium and the short staple cottons. The area and spread of this variety is more or less confined to the Western part of the State with an average rainfall of nearly 35 to 45 inches and spread over the four districts of Shimoga, Kadur, Hassan, and Mysore. The Northern District of Chitaldrug is also increasingly coming under this cotton. Its cultivation under assured supply of water from the Krishnarajasagara Reservoir Project, especially in the Malavalli Maddur Zone of the Irwin Canal, has been taken up recently and the first results are very encoura-

ging. It is hoped to develop this area as one of the large blocks for the development of this cotton. During the year under review, 1,48,000 lbs. of M. A. V. seeds were collected and distributed.

Selection 69. This is a medium staple cotton evolved by the Department as a substitute for the indigenous types in the Black Soil tracts. It is mainly suited to that particular type of soil and is largely grown in the Northern and North-Western Districts of Shimoga and Chitaldrug. It is also grown to some extent in the South East of the Southern District of Mysore, adjoining the Coimbatore District of Madras Presidency. During the year, 5,000 lbs. of Selection 69 seeds were collected and distributed.

Intensive propaganda is carried out through demonstration plots for the growing of improved strains and help is given in the timely cultivation of the crop. The advantages of marketing the produce through the Co-operative Societies are being vigorously brought home to the ryots and three such Societies are now in existence.

CHAPTER VII.

COTTON MARKETING, LEGISLATION AND OTHER PROTECTIVE MEASURES.

(i) Cotton Export Policy.

In November 1947, the Committee passed a resolution recommending to the Government of India that the exports of cotton should be allowed free to all permissible destinations up to the 31st March, 1948. The Committee also recommended that the ceiling prices of cotton should be removed as these had resulted in keeping the prices of Indian cotton artificially below world prices at the expense of the Indian cotton grower and it further suggested that the question of the control on prices of cloth should be reviewed in the light of the action that might be taken regarding the removal of the ceiling prices on cotton. With effect from the 15th January, 1948, the Government of India prohibited exports of cotton other than the five short staple varieties *viz.*, Bengal *deshi*, Oomra *deshi* (excluding C. P. I and II) Mathio, Assams and Comillas. This was done with a view to conserving supplies of cotton of the type required by Indian mills. The recommendation of the Committee for the removal of ceiling prices on cotton was given effect to from the same date, while control on cotton textiles was relaxed considerably. Towards the end of the season, however, both the controls were reimposed because immediately after decontrol the prices of both raw cotton and cloth rose unexpectedly high and the supplies of cloth at reasonable prices became scarce.

(ii) Exemption of Cotton, Cotton seed and Cotton Yarn from Sales Tax.—

The attention of the Committee was drawn to the United Provinces Sales Tax Bill in which cotton was not exempted from the tax. The Committee made a representation to the United Provinces Government that cotton, cotton seed and cotton yarn should be exempted from the sales tax as was the case in Bombay Province. The matter is still under the consideration of the United Provinces Government. A representation made by the Committee to the Government of Madras with a view to having cotton seed exempted from the Madras Sales Tax was reiterated. The Madras Government have again regretted their inability to accept the Committee's proposal.

(iii) System of Survey and appeal of East India Cotton Association.—

The recommendation made by the Indian Central Cotton Committee to the Government of Bombay, in connection with the control and regulation

of the cotton trade in Bombay, that the then existing system of survey under the bye-laws of the East India Cotton Association should be replaced by one of survey by whole time sworn paid surveyors, was accepted by the Government of Bombay and given effect to by the East India Cotton Association during the year under report.

(iv) **Revision of the Indian Cotton Contract.**—The question of revision of the Indian cotton contract was considered by the Local Sub-Committee of the Indian Central Cotton Committee in the light of the proposals made by the Hedge Contracts Sub-Committee of the East India Cotton Association. The majority of the Hedge Contract Sub-Committee had opined that the basis of the Indian Cotton Contract should be Fine Jarila, 3/4" in staple. However, the Local Sub-Committee after due consideration of the question suggested that with a view to discouraging mixing of cotton, the basis should be Fine Jarila 25/32", without any tolerance. In the revised contract as ultimately brought into force, Jarila 25/32", with a tolerance of 1/32" was adopted as the basis. Though this does not give full effect to the Committee's recommendation, nevertheless it is a step in the right direction which, it is hoped, would eventually lead to the abolition of the tolerance altogether.

(v) **Cotton Baling Hoops.**—

The arrangements for the distribution of cotton baling hoops were continued along the lines of the past year. During the year under report, some 6,903 tons of hoops were distributed to pressing factories in the country through the agency of this office working in conjunction with the Iron and Steel Controller. On the recommendation of the Baling Hoops Advisory Committee, the Government of India announced their decision not to fix any maximum rate for pressing cotton during the 1947-48 season, due to the varying rates of indigenous, English and American hoops.

(vi) **Fuel Requirements of Ginning and Pressing Factories.**—

The arrangements for the supply of coal, under priority, to cotton ginning and pressing factories on the recommendation of this office working in conjunction with the Textile Commissioner, Bombay, were continued during the season under report. The total quantity of coal recommended by this office for supply to ginning and pressing factories during the year amounted to about 1,63,000 tons. In addition, assistance was given to the factories in the matter of obtaining iron and steel required for maintenance and repairs.

(vii) Dismantling of Cotton Ginning and Pressing Factories.—

As in the previous years, this office continued to deal with applications for the grant of permission for the dismantling of cotton ginning and pressing factories, referred for opinion by the Textile Commissioner, Bombay.

(viii) Regulated Cotton Markets.—

In the past, the Cotton Committee had recommended to the Provincial and State Governments that they should establish regulated markets for the orderly and remunerative marketing of cotton. Accordingly, legislation for the establishment of regulated markets had been enacted in the Provinces of Bombay, Madras, the East Punjab and the Central Provinces and the Hyderabad, Baroda, Indore, Chota Udepur and Sangli States. In the year under report 15 regulated markets were functioning in the Province of Bombay under the Agricultural Produce Markets Act, and 4 more markets at Pandharpur, Barsi, Nargund and Athani are expected to function as soon as the bye-laws are approved. In the East Punjab, under the Agricultural Produce Markets Act, 1939, there were 44 market committees working in 1947-48. The Act has been extended to seven more areas where, however, market committees have yet to start functioning. In Madras, 3 regulated markets continued to function at Tirupur, Adoni and Nandyal. In the Hyderabad State under the Hyderabad Agricultural Produce Markets Act, 42 regulated markets functioned during the year under report as against only 34 in the previous year. The markets continued to work satisfactorily.

(ix) Agmarking.—

During the year, Agmarking of cotton bales continued at Hubli, Gadag, Bailhongal and Savanur as a guarantee of purity of cotton by affixing Agmark labels to bales after supervision of ginning and pressing by a special staff.

(x) Legislation to Maintain the Purity of Cotton and other Protective measures.—

Several legislative measures have been passed by the Central and Provincial Governments on the recommendation of the Indian Central Cotton Committee with a view to checking the spread of undesirable or inferior types of cotton, insect pests and diseases and malpractices in marketing. A brief account of the working of these measures during the year under review is given below. For more details, previous reports may be referred to.

(a) **Cotton Transport Act.**—The Cotton Transport Act, in so far as it relates to rail transport only, had been applied to the East Khandesh and parts of West Khandesh and Nasik districts of Bombay Province in 1946. In the year under review these restrictions were extended to road transport as well. The Act continued to be in operation in the Kumpta, Dharwar, Bagalkot and Bijapur Protected Areas.

(b) **Cotton Ginning and Pressing Factories Act.**—

The Government of the undivided Punjab sent to the Committee for comments the draft Punjab Cotton Ginning and Pressing Factories Bill providing penalties against mixing, watering and adulteration of cotton. This was considered by the Committee and its comments thereon were duly communicated to the East Punjab Government.

The attention of the Committee was drawn to the fact that under the Cotton Ginning and Pressing Factories Act, cotton was defined as including cotton waste and enquiry was made whether cotton waste pressed should be accounted for in the cotton press returns prescribed under the Act. It was decided that in addition to the statistics of pressings of raw cotton, information regarding cotton waste pressed should also be collected. The Provincial and State Governments concerned were requested to amend the form of return prescribed under the Act to provide for the collection of the statistics for raw cotton and cotton waste separately.

Out of 68 Indian States which have enforced in their respective territories the main provisions of the Cotton Ginning and Pressing Factories Act as applied to what was formerly British India, by legislation or executive orders, weekly returns of cotton pressed were received from 33 States; in the remaining States, pressing factories did not work during the year.

(c) **Prevention of Introduction of Foreign Cotton Pests.**—

In order to prevent the introduction into India of the Mexican Boll Weevil (*Anthonomus grandis*) with imported American cotton, at the instance of the Committee, regulations have been imposed by the Government of India under which the import of American cotton into India is prohibited except through the port of Bombay where it must be fumigated with hydrocyanic acid gas before entry into the country. The work of fumigation is carried out under the technical supervision of the Secretary, and the cost involved is

met by the levy of a small fee from importers on each bale of American cotton fumigated. During the year under review 20,628 bales of American cotton were imported and fumigated.

The restrictions on the import of foreign *kapas* (unginned cotton) and of foreign cotton seed remained in force throughout the year.

(d) **Cotton Control Act.**—Cotton Control Acts are in operation in the Provinces of Madras, Bombay and the Central Provinces and in the Baroda and Bhopal States. During the year, the Bombay Control Act, 1942, was repealed and in its place an amended Act—The Bombay Cotton Control (Repeal and Re-enactment) Act, 1947, was passed by the Government of Bombay. This provides for the prohibition of mixing of any standard cotton with another standard cotton.

It is reported that due to the vigorous propaganda carried out by the staff of the Central Provinces Agricultural Department, the cultivation and trade in Garrow Hill Cotton, against which the Central Provinces Cotton Control Act was directed, have become extinct.

K. SAWHNEY.

Secretary.

APPENDIX I.

BILL.

Further to amend the Indian Cotton Cess Act, 1923.

WHEREAS it is expedient further to amend the Indian Cotton Cess Act, 1923 (XIV of 1923), for the purposes hereinafter appearing ;

It is hereby enacted as follows :—

1. *Short title.*—This act may be called the Indian Cotton Cess (Amendment) Act, 1947.
2. *Amendment for section 3, Act XIV of 1923.*—In sub-section (1) of section 3 of the Indian Cotton Cess Act, 1923, the words “ produced in India and either ” and the proviso shall be omitted.
3. *Amendment to have retrospective effect.*—The amendment made by section 2 shall have effect as if this Act had come into force on the fifteenth day of August 1947.

STATEMENT OF OBJECTS AND REASONS.

This Bill is designed to prevent the loss of income to the Indian Central Cotton Committee consequent on the creation of the Dominion of Pakistan. Under the Indian Cotton Cess Act 1923, cotton produced in India and either consumed by the mills in India or exported is subject to the levy of a cess, the proceeds of which are utilised in financing the Indian Central Cotton Committee. As cotton produced in Pakistan is no longer cotton ‘ produced in India ’, it has become necessary to amend this Act with retrospective effect to permit levy of the cess on cotton produced in Pakistan and consumed in Indian Mills so as to prevent loss of income to the Committee in respect of Pakistan cotton consumed by Indian Mills.

(Sd.) RAJENDRA PRASAD

NEW DELHI,

8th December, 1947.

A. BILL* No. -62 of 1948.

A Bill further to amend the Indian Cotton Cess Act, 1923.

WHEREAS it is expedient further to amend the Indian Cotton Cess Act, 1923 (XIV of 1923), for the purposes hereinafter appearing ;

It is hereby enacted as follows :—

1. *SHORT TITLE*.—This Act may be called the Indian Cotton Cess (Amendment) Act, 1948.

2. *Amendment of section 3, Act XIV of 1923*.—In sub-section (1) of section 3 of the Indian Cotton Cess Act, 1923 (XIV of 1923) (hereinafter referred to as the said Act) for the words “two annas” and “six pies” the words “four annas” and “one anna” shall be substituted respectively.

3. *Amendment of section 4, Act XIV of 1923*.—In section 4 of the said Act.—

(a) for items (viii), (ix) and (x) the following items shall be substituted, namely.—

“ (viii) nine persons nominated by the Central Government to represent the cotton growing industry, of whom two shall be nominated to represent the industry in Madras, two to represent the industry in Bombay, two to represent the industry in the United Provinces, two to represent the industry in the Central Provinces and Berar, and one to represent the industry in East Punjab ;

(ix) seven persons nominated respectively by the Governments of the following Acceding States, namely, Mysore, the United States of Gwalior, Indore and Malwa (Madhya-Bharat), the United State of Rajasthan, the United State of Vindhya Pradesh, the Patiala and East Punjab States' Union, the United State of Kathiawar (Saurashtra) and Baroda ; and ”

(b) item (xi) shall be renumbered as item (x).

4. *Amendment of section 12, Act XIV of 1923*.—In sub-section (2) of section 12 of the said Act, after the words “in India”, the words “or for the improvement and development of the methods of growing, manufacturing and marketing of Indian cotton” shall be inserted.

5. *Repeal of section 12A, Act XIV of 1923*.—Section 12A of the said Act shall be omitted.

STATEMENT OF OBJECTS AND REASONS.

This Bill seeks to double the rate of the Cess leviable on cotton produced in India and either exported from any custom port to any outside India or consumed in any mill in India under the Indian Cotton Cess Act of 1923. Until the entry of Japan into the last war, the Central Cotton Committee enjoyed a sound financial position with an income of between Rs. 6 and Rs. 8 lakhs per annum. With the entry of Japan in the last War, the receipts from the Cess fell off considerably and the Committee had to draw upon its surplus balances to continue its programme of activities. As the surplus got depleted gradually, the Committee recommended in 1945 that the rate of the cess should be doubled.

*In pursuance of clause (a) of sub-section (1) of section 37 of the Government of India Act, 1935, the Governor-General has recommended the introduction of this Bill in the Legislature.

Before doing so, however, the Government of India decided to make grants from the Cotton Fund, which was built up from the proceeds of the import duty on raw cotton imposed by the Cotton Fund Ordinance (VIII of 1942). In order to enable the Committee to have a permanent source of income, it is considered necessary to double the rate of cess on cotton and also to permit the Committee to continue to receive grants from the Cotton Fund.

2. Under section 12 (2) of the Indian Cotton Cess Act, 1923, the Committee is permitted to apply the proceeds of the Cess on cotton and any other monies received by it to meet the cost of such measures as it may, with the previous approval of the Central Government, undertake for promoting agricultural and technological research in the interests of the cotton industry in India. This sub-section precludes the Committee from spending any monies received by it on development schemes. Since grants from the Cotton Fund can only be used for development schemes, it is proposed to amend this sub-section as well.

3. Opportunity is also being taken to undertake the following amendments due to the political changes in the country :—

(a) The representation granted to the cotton growing industry of the Punjab under section 4 (viii) is being reduced from two to one for East Punjab.

(b) The representation granted to Hyderabad State under section 4 (ix) is being deleted. The intention is to grant representation to this State under section 4 (xi) if and when negotiations with that State take a favourable turn.

(c) The representation granted to Gwalior and the States in Central India and Rajputana is being revised according to the re-grouping of the States into Unions, and representation is also being granted to certain other Unions and States, *e.g.*, Vindhya Pradesh, Patiala and East Punjab States' Union, Saurashtra and Mysore.

4. Section 12A of the Act is being omitted as it is obsolete.

JAIRAMDAS DOULATRAM

NEW DELHI :

2nd August, 1948.

APPENDIX II.

MEMBERS OF THE INDIAN CENTRAL COTTON COMMITTEE.

- (1) *President*, Sardar Datar Singh, Vice-Chairman, Indian Council of Agricultural Research, *ex-officio*.

The Agricultural Commissioner with the Government of India, *ex-officio*.

- (2) Representatives of Agricultural Departments :—

<i>Madras</i>	Shri M. S. Sivaraman.
<i>Bombay</i>	Dr. B. N. Uppal.
<i>United Provinces</i>	Dr. S. B. Singh.
<i>Central Provinces and Berar</i>	Shri P. D. Nair
<i>East Punjab</i>	Sardar Lal Singh.

- (3) The Director of Commercial Intelligence and Statistics, *ex-officio*.

- (4) Representatives of Chambers of Commerce and Associations :—

The East India Cotton Association	Shri Purshotamdas Thakurdas.
The Bombay Millowners' Association	Shri Bhagwandas C. Mehta.
The Bombay Chamber of Commerce	Mr. L. F. H. Goodwin.
The Indian Merchants' Chamber	Shri Chimanlal B. Parikh.
The Ahmedabad Millowners' Association	Shri Nanddas Haridas.
The Tuticorin Chamber of Commerce	Mr. A. Mueller.
The Upper India Chamber of Commerce	Major S. R. Pocock, M. C.
The Empire Cotton Growing Corporation	Vacant, <i>vice</i> Sir William Roberts.

- (5) Commercial Representatives nominated by Central Government :—

<i>Central Provinces and Berar</i>	Shri Pukharaj Kochar.
	Shri Kishanlal Goenka.
<i>Madras</i>	Shri Doraiswamy Naidu
<i>East Punjab</i>	Shri Ram Narain Varmani.

- (6) Bengal Representative Dr. N. Dutt.

- (7) Co-operative Banking Representative :—Vacant.

- (8) Representatives of Cotton Growing Industry :—

<i>Madras</i>	Shri D. Gnanasiromani.
	Shri H. Sitarama Reddy.
<i>Bombay</i>	Shri F. B. Loxmeshwar.
	Raje J. R. Deshmukh.
<i>United Provinces</i>	Major Mohd. Jamshed Ali Khan.
	Lala Basant Lal Agarwala.
<i>Central Provinces & Berar</i>	Shri S. K. Wankhede
	Shri P. S. Patil.
<i>East Punjab</i>	Sardar Gurbachan Singh Bajwa.

(9) Representatives of Indian States :—

<i>Hyderabad State</i>	—	..	..	Vacant.
<i>Baroda State</i>	..	..	..	Mr. C. A. MacLean, M.C.
<i>Gwalior State</i>	..	..	..	Vacant.
<i>Rajputana and Central India States</i>	..			Dr. D. V. Bal.

(10) Additional Members nominated by the Governor-General in Council :—

Shri R. G. Saraiya.	Dr. V. K. R. V. Rao.
Shri Chunilal B. Mehta.	Shri Biswanath Das.
Shri T. Vijayaraghavacharya.	Mr. Camar Tyabjee.
Shri Shankar Lal.	Shri W. R. Natu.
Shri Padampat Singhania.	Shri G. B. Patel.
Shri K. K. Chettur.	Shri R. Balasubramania Ayyar.
Shri P. H. Rama Reddi.	Mr. M. A. A. Ansari.
Mr. D. N. Mahta.	

APPENDIX III.

SUB-COMMITTEES.

Standing Finance Sub-Committee :—Shri R. G. Saraiya (*Vice-President*), Chairman ; Sardar Datar Singh. (*President*) (*ex-officio*) ; Shri Purshotamdas Thakurdas ; Shri Chunilal B. Mehta ; Vacant *vice* Shri Chunilal V. Mehta ; Vacant *vice* Shri Madhaorao Deshpande ; Shri Chimanlal B. Parikh ; Shri Bhagwandas C. Mehta and Mr. D. N. Mahta.

Local Sub-Committee :—*President* (Sardar Datar Singh) ; *the Vice-President* (Shri R. G. Saraiya) ; Shri Purshotamdas Thakurdas ; Shri Chunilal B. Mehta ; Vacant *vice* Shri Chunilal V. Mehta ; Vacant *vice* Shri Madhaorao Deshpande ; Shri Bhagwandas C. Mehta ; Mr. D. N. Mahta ; Mr. L. F. H. Goodwin ; Shri Chimanlal B. Parikh ; Raje J. R. Deshmukh ; Dr. B. N. Uppal and Mr. A. Mueller.

AGRICULTURAL RESEARCH SUB-COMMITTEE.

- I. *The President* :—Sardar Datar Singh (*ex-officio*).
- II. *The Vice-President* :—Shri R. G. Saraiya.
- III. *The Co-operative Banking Representative* :—Vacant *vice* Shri Chunilal V. Mehta (*ex-officio*).
- IV. *Cotton Growers' Representatives* :—Vacant *vice* Sir William Roberts ; Vacant *vice* Shri Madhaorao Deshpande and vacant *vice* Mir Riyat Ali.
- V. *Cotton Trade Representatives* :—Shri Purshotamdas Thakurdas, Shri Chunilal B. Mehta, Mr. A. Mueller, Mr. L. F. H. Goodwin and vacant *vice* Seth Gopaldas Mohta.
- VI. *Agricultural Officers* :—The Agricultural Commissioner with the Government of India (*ex-officio*) ; Shri M. S. Sivaraman ; Mr. C. A. MacLean ; Shri P. D. Nair ; Dr. D. V. Bal ; Shri P. H. Rama Reddy ; Vacant *vice* Shri N. M. Deshmukh ; Dr. B. N. Uppal ; Shri D. V. Narayanayya ; Dr. S. B. Singh ; Vacant *vice* Shri Kalidas Sawhney.
- VII. *Additional Members* :—Shri T. Vijayaraghavacharya ; Mr. D. N. Mahta ; Shri W. R. Natu, Shri R. Balasubramania Ayyar ; Dr. S. D. Chaudhary ; Shri G. B. Patel ; Mr. M. A. A. Ansari ; Raje J. R. Deshmukh ; Shri S. S. Pande ; Prof. R. H. Dastur ; Shri D. L. Sen ; Dr. V. G. Panse ; Shri P. D. Gadkari ; Dr. S. M. Sikka.
- VIII. The Secretary, Indian Central Cotton Committee, (*ex-officio*).

TECHNOLOGICAL RESEARCH SUB-COMMITTEE.

The President, Sardar Datar Singh (*ex-officio*) ; *The Vice-President*, Shri R. G. Saraiya (*ex-officio*) ; The Agricultural Commissioner with the Government of India (*ex-officio*) ; Shri Purshotamdas Thakurdas ; Vacant *vice* Shri Chunilal V. Mehta ; Shri T. Vijayaraghavacharya ; Shri Chunilal B. Mehta ; Vacant *vice* Sir William Roberts ; Shri Padampat Singhania ; Shri Shankar Lal ; Mr. D. N. Mahta ; Mr. L. F. H. Goodwin ; Shri P. D. Nair ; Dr. B. N. Uppal ; Shri M. S. Sivaraman ; Major S. R. Pocock ; Vacant *vice* Seth Gopaldas

Mohta ; Mr. A. Mueller ; Shri Bhagwandas C. Mehta ; Shri Pukharaj Kochar ; Shri R. Balasubramania Ayyar ; Mr. M. A. A. Ansari ; Vacant *vice* Mir Riyat Ali ; Dr. K. Venkataraman ; The Director of Industries, Bombay ; The Principal, Victoria Jubilee Technical Institute, Bombay ; Shri S. S. Pande ; Dr. V. G. Panse ; Shri D. L. Sen (Director, Technological Laboratory) ; Shri P. D. Gadkari ; Shri G. B. Patel ; Vacant *vice* Shri Kalidas Sawhney ; Mr. Neville N. Wadia and Shri B. D. Kulkarni ; (Representing the Bombay Millowners' Association), Shri Arvindbhai Narotambhai and Shri Chandrakant Motilal ; (Representing the Ahmedabad Millowners' Association), Mr. Jehangir Pestonji Patel and Shri Jamnadas Ramdas ; (Representing the East India Cotton Association) and Shri S. Krishna (Representative of the Board of Scientific and Industrial Research).

COTTON FORECAST SUB-COMMITTEE.

The President, Sardar Datar Singh (*ex-officio*) ; *The Vice-President*, Shri R. G. Saraiya ; The Agricultural Commissioner with the Government of India (*ex-officio*) ; The Director General of Commercial Intelligence and Statistics ; Dr. V. K. R. V. Rao ; the Director of Agriculture, Bombay Province ; The Director of Agriculture, Madras Province ; The Director of Agriculture, United Provinces ; The Director of Agriculture, Central Provinces and Berar ; The Statistical Officer, Department of Industries and Commerce, Madras Province ; Vacant *vice* Shri Chunilal V. Mehta ; Shri Chunilal B. Mehta, Vacant *vice* Sir William Roberts ; The Commissioner of Agriculture, Baroda ; The Director of Land Records, Central Provinces and Berar ; Mr. D. N. Mahta ; Mr. L. F. H. Goodwin ; Shri W. R. Natu ; Mr. A. Mueller and Dr. V. G. Panse.

COTTON GINNING AND PRESSING FACTORIES SUB-COMMITTEE.

The President, Sardar Datar Singh ; *the Vice-President*, Shri R. G. Saraiya (*ex-officio*) ; Shri Chunilal B. Mehta, the Co-operative Banking Representative ; Vacant *vice* Shri Chunilal V. Mehta (*ex-officio*) ; Shri Purshotamdas Thakurdas ; Shri Bhagwandas C. Mehta ; Mr. A. Mueller ; Mr. L. F. H. Goodwin ; Vacant *vice* Sir William Roberts ; Major S. R. Pocock ; Shri G. V. Doraiswamy Naidu ; Shri Pukharaj Kochar ; Dr. B. N. Uppal ; Shri P. D. Nair and Shri D. L. Sen.

APPENDIX IV.

INDIAN CENTRAL COTTON COMMITTEE

Statement of Receipts and Payments for the year ended 31st March, 1948.

RECEIPTS.						EXPENDITURE.					
		Rs.	a. p.	Rs.	a. p.			Rs.	a. p.	Rs.	a. p.
<i>Opening Balance as on 1st April, 1947</i>		21,27,297	13 4								
Sinking Fund	..	24,582	13 0								
		21,51,880		10	4						
<i>Less :—Adjustment of Suspense Receipts during 1946-47</i>				1,651	12 3						
		21,50,228		14	1						
<i>Receipts under Section 12 of the Indian Cotton Cess Act 1923</i>						4,82,343	8 4				
<i>Other Receipts :—</i>											
<i>Sale of Publications, Sale of Cotton, Miscellaneous Receipts, Test Fees, etc.</i>		20,384	15 9								
<i>Suspense Receipts</i>		703	3 6								
<i>Sinking Fund Provision for 1947-48</i>		1,839	0 0								
		22,927		3	3						
<i>Interest on Investments</i>				67,301	2 7						
		90,228		5	10						
<i>Net Profit realised on Sale of Securities</i>						58,146	14 0				
		27,80,947		10	3						
Total											
						<i>Administration of the Committee :—</i>					
						<i>(Including Improvement of Cotton Marketing, Printing, Publicity and Distribution and Travelling Allowance of Non-Official Members)</i>					
								2,28,711	11 1		
						<i>Agricultural Research Grants-in-Aid :—</i>					
						<i>(Including Research, Seed, Marketing and Miscellaneous Schemes)</i>					
								4,87,122	10 11		
						<i>Technological Research :—</i>					
								2,77,060	14 7		
						<i>Closing Balance :—</i>					
						<i>(Government Paper at cost)</i>					
						<i>2½% Government of India Loan 1950, of the face value of Rs. 8,00,000</i>					
								8,11,500	0 0		
						<i>2½% Government of India Loan 1948-52, of the face value of Rs. 3,70,000</i>					
								3,67,890	10 0		

*3% Government of India Funding Loan 1966-68, of the face value of Rs. 1,50,000	1,52,955	2	0
4½% Government of India Loan 1955-60, of the face value of Rs. 26,600	..	25,004	0 0
6% Bombay Municipal Debentures 1954, of the face value of Rs. 10,000	.. ..	3,950	0 0
6% Rangoon Municipal Debentures 1955, of the face value of Rs. 3,83,500	.. ..	4,15,328	2 0
		17,76,625	14 0

(Market value on 31st March 1948, Rs. 17,86,344-2-0 inclusive of Rangoon Municipal Debentures taken at cost).

Imprests :—

- (1) Secretary's Office : 1,500 0 0
- (2) Director, Technological Laboratory, Matunga 500 0 0

Carried over 27,80,947 10 3

Carried over 17,76,625 14 0 9,92,895 4 7

* 3% Government of India Funding Loan 1966-68 have been deposited with the Imperial Bank of India, Bombay as security against any overdraft that may be required by the Committee.

Statement of Receipts and Payments for the year ended 31st March 1948—contd.

RECEIPTS.			EXPENDITURE.					
	Rs.	a. p.		Rs.	a. p.	Rs.	a. p.	
Brought Forward ..	27,80,947	10 3	Brought forward	17,76,625	14 0	9,92,895	4 7	
			(3) Director of Agriculture, Bombay ..	1,795	0 0			
			(4) Director of Agriculture, Sind ..	510	0 0			
			(5) Cotton Re- search Botanist, Lyallpur ..	150	0 0			
			(6) Plant Physio- logist, Indore..	400	0 0			
						4,855	0 0	
			<i>Suspense : Recover- able)</i>					
			(1) Committee's Accounts ..	1,118	8 2			
			(2) Hoops and Fuel A/c					
			Expen- diture incur- red 32,761 15 0					
			<i>Less :—</i>					
			Rpts. 2,598 1 0	30,163	14 0	31,282	6 2	
						18,12,763	4 2	

Less :—Overdraft Account with
the Imperial Bank of India,
Bombay, (against hypotheca-
tion of 3% Govt. of India Fund-
ing Loan 1966-68, of the face
value of Rs. 1,50,000)

24,710 14 6

† Total Closing Balance

17,88,052 5 3

Total .. 27,80,947 10 3

Total 27,80,947 10 3

We have examined the above Statement of Receipts and Payments of Indian Central Cotton Committee with the Books, Vouchers and Certified Returns of the Committee, have obtained all the Information and explanations we have required and certify that to the best of our information and explanation received the above Statement is a correct abstract of the figures appearing in the Books and is drawn up in conformity with the Rules under the Indian Cotton Cess Act, 1923.

† Includes Rs. 26,421-13-0 on account of Sinking Fund.

(Sd.) S. B. BILLIMORIA, & Co.

Registered Accountants, Auditors.

Bombay, 30th August, 1948.

Provident Fund Account as at 31st March, 1948.

RECEIPTS.				EXPENDITURE.				
Rs.	a. p.	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.	
<i>Opening Balance as on 1st April 1947 ..</i>				<i>Balance :—</i>				
		6,97,341	1 8	<i>(Government Securities at Market Value).</i>				
<i>Less :—Adjustment of Suspense Receipts during 1946-47 ..</i>				3% Government of India Loan, 1949-52, of the face value of Rs. 35,000				
		1,943	7 9			35,393	12 0	
		<u>6,95,397 9 11</u>		4% Government of India Loan 1960-70, of the face value of Rs. 12,600				
<i>Subscribers' Contributions</i>				National Savings Certificates of the face value of Rs. 6,07,500 .				
26,026	0 0					6,07,500	0 0	
<i>Add :—Recoveries against Advances ..</i>				<u>6,57,068 12 0</u>				
13,008	5 0	39,034	5 0	Savings Bank Account with the Imperial Bank of India, Bombay				
		<u>7,34,431 14 11</u>				93	11 6	
<i>Less :—Refunds to Subscribers who have resigned ..</i>				Current Account with the Imperial Bank of India, Bombay ..				
32,531	15 11					25,748	11 8	
<i>Advances to Subscribers</i>				<u>6,82,911 3 2</u>				
14,251	3 0	46,783	2 11	Investments Fluctuation Account:—				
		<u>6,87,648 12 0</u>		<i>(Depreciation in Market Value of Securities)</i>				
<i>Committee's Contributions received from Indian Central Cotton Committee ..</i>				473				6 0
25,265	10 0			<i>Add :—Committee's Contribution received from Provincial Government for subscribers on deputation</i>				
		1,216	14 0	<u>26,482 8 0</u>				
		<u>7,14,131 4 0</u>						

Less :—Payments made to Subscribers who have resigned, including transfers to "Lapses and Forfeitures Account" for Contributions disallowed	31,790	3	7	6,82,341	0	5		
Interest received on Investments	1,599	6	0					
Interest received on Advances to Subscribers	719	1	5					
	2,318	7	5					
Less :—Interest paid during the year to Subscribers who have resigned :—								
On their own contributions	1,102	1	0					
On Committee's contributions	502	14	5					
Bank's Commission for collection of interest etc.	1	14	6	1,606	13	11	711	9
Lapses and Forfeiture Account				331	15	3		
Total				6,83,384	9	2	Total	6,83,384 9 2

Examined and found correct.

Bombay, 30th August, 1948.

(Sd.) S. B. BILLIMORIA, & Co.

Registered Accountants, Auditors.

INDIAN CENTRAL COTTON COMMITTEE

Balance Sheet as at 31st March, 1948.

RECEIPTS								EXPENDITURE.									
Cotton cess		Cotton Fund.		Total.		Cotton Cess.		Cotton Fund.		Total.		Cotton Cess.		Cotton Fund.		Total.	
Rs.	a. p.	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.
Cotton Cess Receipts	1,74,26,071	1	0														
<i>Less—Refund of cess to Burma</i>	42,369	10	9														
	<u>1,73,83,701</u>	<u>6</u>	<u>3</u>			1,73,83,701	6	3									
<i>Interest account.</i>																	
Amount recovered on investments	25,12,375	8	10														
<i>Add—Refund of income-tax on interest</i>	33,830	5	6														
	<u>25,40,205</u>	<u>14</u>	<u>4</u>														
<i>Less :</i>																	
1. Interest paid in advance at the time of purchase of Government Paper (since recovered, interest on temporary overdraft and Bank's commission for collection of interest)	78,573	5	3														
2. Interest credited to Provident Fund	4,886	6	2														
3. Bank's withdrawal charges	6,279	13	0														
4. Income-tax on interest	32,839	18	1														
5. Brokerage for securities sold	828	10	0														
I. A. Administration																	
B. Improvement of Cotton Marketing :																	
(1) Cost of exhibits, travelling allowance of representatives on the Board of the East India Cotton Association and members of Standards Sub-Committee and cost of standards																	
	2,37,012	9	6														
(2) Enquiry into cost of cotton production in India																	
	2,71,963	8	9														
	<u>5,08,976</u>	<u>2</u>	<u>3</u>											5,08,976	2	3	
C. Travelling allowance of non-official members																	
	3,35,013	10	9											3,35,013	10	9	
D. Printing & Propaganda :—																	
(1) Publicity & Propaganda																	
	1,56,555	15	0														
(2) Printing & Distribution																	
	1,77,561	8	6														
	<u>3,34,117</u>	<u>7</u>	<u>6</u>											3,34,117	7	6	
E. Statistical Research :—																	
(1) Studies of village consumption of Indian cotton																	
	23,913	5	8											23,913	5	8	
(2) Improvement of cotton forecast																	
	30,772	9	0											30,772	9	0	
(3) Crop estimating survey on cotton in C. P.																	
	5,880	9	0							99,551	8	9		1,05,432	1	9	
(4) Statistical analysis of experimental data																	
	2,020	10	0											2,020	10	0	
	<u>62,587</u>	<u>1</u>	<u>8</u>							<u>99,551</u>	<u>8</u>	<u>9</u>		<u>1,62,138</u>	<u>10</u>	<u>5</u>	
Total																	

6. Provision of Sinking Fund ..	26,421 13 0			
	<u>1,49,829 12 6</u>		28,96,376 1 10	
	<u>23,96,376 1 10</u>			
Profit on conversion and sale of securities ..	4,22,834 0 2		4,22,834 0 2	
Sinking Fund account ..	26,421 13 0		26,421 13 0	
Miscellaneous receipts ..	2,22,824 9 5		2,22,824 9 5	
Refund from Provident Fund for contributions disallowed ..	3,891 1 11		3,891 1 11	
Receipts from the Cotton Fund ..		27,89,782 0 0		
Less :—Amount refunded ..		<u>38,866 0 0</u>		
		<u>27,53,416 0 0</u>	27,53,416 0 0	
uspense receipts ..	703 3 6		703 3 6	
Carried over ..	2,04,56,252 4 1	27,53,416 0 0	2,32,09,688 4 1	

II. AGRICULTURAL RESEARCH GRANTS-IN-AID.

(1) RESEARCH SCHEMES

(i) Bombay :—

(1) a. Surat Physiological..	2,45,139 11 3			2,45,139 11 3
b. do. Writing up ..	5,814 7 8			5,814 7 8
2) a. Surat Bollworm ..	1,14,509 9 7			1,14,509 9 7
b. do. Propaganda ..	91,468 9 2			91,468 9 2
c. do. Writing-up ..	2,315 3 0			2,315 3 0
(3) a. Dharwar wilt ..	1,82,836 4 11			1,82,836 4 11
b. do. Writing-up ..	10,902 10 3			10,902 10 3
(4) Khandesh ..	26,573 5 0			26,573 5 0
(5) Co-ordination of cotton research ..	1,749 7 6			1,749 7 6
(6) Jalgaon cotton breeding ..	87,324 9 2	4,716 4 0		92,040 13 2
(7) Broach cotton breeding ..	1,25,314 0 2	7,349 10 0		1,32,663 10 2
(8) Small leaf disease survey ..	2,938 9 6	2,300 0 0		5,238 9 6
(9) Survey of Goghari cotton ..	4,199 5 0			4,199 5 0
(10) Defibrination of cotton seed ..	4,878 5 0			4,878 5 9
(11) Plant Puller propaganda ..	21,940 1 3			21,940 1 3
(12) Breeding of wilt-resistant cotton for Surat area ..	36,417 0 0			36,417 0 0
(13) Village projects for improvement of cultivation of crops ..	1,081 5 4	1,813 6 0		2,894 11 4
(14) Inclusion of Northern and Westerns in dry farming research at Bijapur ..	6,953 12 7			6,953 12 7
(15) Poona wilt breeding ..	91,621 14 6	6,080 7 0		97,702 5 6
(16) Improvement of cotton crop in Kaira district ..	14,655 13 6			14,655 13 6
(17) Interspecific hybridisation at Surat ..	39,336 6 11	49,604 14 4		88,991 5 3

Carried over	11,18,020 8 4	71,864 9 4	11,89,885 1 4
	<u>59,31,101 15 4</u>	<u>171,416 2 1</u>	<u>61,02,518 1 5</u>

Balance Sheet as at 31st March, 1948.—(contd.)

RECEIPTS.								EXPENDITURE.									
Cotton Cess		Cotton Fund.		Total.				Cotton Cess.		Cotton Fund.		Total.					
Rs.	a. p.	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.		
Brought forward ..								59,31,101	15	4	1,71,416	2	1	61,02,518	1	8	
								(i) <i>Bombay</i> :—contd.									
								11,18,020	8	0	71,864	9	4	11,89,885	1	4	
								Wagad cotton at Viramgaon and Bavla									
								64,205	1	2	7,115	12	3	71,320	13	5	
								(19) Improvement of Dharwar-American cotton									
								14,304	3	3	8,975	11	9	23,279	15	0	
								(20) Co-ordinated crop weather scheme									
											12,430	15	0	12,430	15	0	
								Total ..	11,96,529	12	5	1,00,387	0	4	12,96,916	12	9
								(ii) <i>Madras</i> :—									
								1,42,466	13	1				1,42,466	13	1	
								(1) Herbaccum									
								2,01,034	15	9				2,01,034	15	9	
								(2) Pemphres & Physiological.									
								19,517	9	4				19,517	9	4	
								(3) Fodder cholam									
								17,727	2	6				17,727	2	6	
								(4) Breeding of Nadam cotton ..									
								71,442	2	1	4,722			76,164	8	1	
								(5) Improvement of Mungari cotton									
								(6) Investigation of the possibilities of control of cotton stem weevil									
								6,165	7	6				6,165	7	6	
								(7) Improvement of Cocanadas cotton									
								41,938	4	4	46,876	13	6	88,815	1	10	
								(8) Scheme for production of long staple cotton									
										18,443	14	0	18,443	14	0	
								(9) Breeding of Cambodia cotton in Ceded districts									
										51,068	8	9	51,068	8	9	
								Total ..	5,00,292	6	7	1,21,111	10	3	6,21,404	0	10
								(iii) <i>Punjab</i> :—									
								6,81,171	2	7				6,81,171	2	7	
								(1) Botanical									
								2,25,908	7	11				2,25,908		11	
								(2) Entomological									

(8) White Fly	48,721	4	1	48,721	4	1			
(4) Root Rot	71,048	10	10	71,048	10	10			
(5) Spraying trials	9,977	0	6	9,977	0	6			
(6) Defibration & Delinting	6,112	8	9	6,112	8	9			
(7) Survey of disease of malformation	1,730	10	6	1,730	10	6			
(8) Physiological	4,09,492	0	4	4,09,492	0	4			
(9) Clean-up Campaign of Spotted Boll-worm	60,025	9	3	60,025	9	3			
(10) Jassid Investigation	21,868	12	3	21,868	12	3			
(11) Improvement of Punjab-American 289F	20,509	12	3	20,509	12	3			
(12) Improvement of cotton in Jhang district		13,146	2	0	13,146	2	0		
(13) Improvement of cotton in South Eastern districts		30,559	2	0	30,559	2	0		
(14) Improvement of cotton in Lower Bari Doab Canal Colony		14,335	15	0	14,335	15	0		
(15) Improvement of cotton in South Western districts		10,773	9	0	10,773	9	0		
Total	15,56,565	15	3	68,814	12	0	16,25,380	11	3

(iv) *Central Provinces & Berar* :—

(1) Botanical	4,93,449	9	4	4,93,449	9	4			
(2) Entomological	12,344	13	6	12,344	13	6			
(3) Investigation of Heliothis obsoleta	1,672	9	9	1,672	9	9			
(4) C. P. & Berar cotton breeding scheme	40,261	8	0	47,629	8	0	96,891	0	9
(5) Village Projects for extension of improvements in cultivation of crops	2,297	10	0	997	13	0	3,295	7	0
Total	5,59,026	3	4	48,627	5	0	6,07,653	8	4

Carried over .. 2,04,56,252 4 1 27,53,416 0 0 2,32,09,633 4 1

Carried over 81,68,248 4 3 4,38,492 4 4 86,06,740 8 7

Balance Sheet as at 31st March, 1948.—(contd.)

RECEIPTS.						
Cotton Cess.		Cotton Fund.		Total.		
Rs.	a. p.	Rs.	a. p.	Rs.	a. p.	
Brought forward ..	2,04,56,252	4	1	27,53,416	0	0 2,32,09,688 4 1

EXPENDITURE.									
Cotton Cess.			Cotton Fund.			Total.			
Rs.	a. p.		Rs.	a. p.		Rs.	a. p.		
Brought forward ..	81,68,248	4	3	4,38,402	4	4	86,06,740	8	7

(v) United Provinces :—

(1) Pink Bollworm	1,46,616	2	10			1,46,616	2	10	
(2) Rohilkhand and Bundelkhand survey	18,061	14	4			18,061	14	4	
(3) Village Projects for extension of improvements in cultivation of crops.. ..	3,125	5	3			3,125	5	3	
(4) Botanical	84,247	15	0	9,741	0	0	93,988	15	0
(5) Scheme for hybridisation in arboreum cottons .. ..	....			13,365	0	0	13,365	0	0
Total ..	2,52,051	5	5	23,106	0	0	2,75,157	14	5

(vi) Indore :—

(1) Institute of Plant Industry ..	10,86,943	12	0	2,61,060	0	6	22,48,003	12	6
(2) Cotton Genetics Research Scheme	2,52,538	4	11			2,52,538	4	11	
(3) Cotton Physiological Research Scheme .. ..	....			2,14,461	14	0	2,14,461	14	0
Total ..	22,39,482	0	11	4,75,521	15	3	27,15,004	0	2

(vii) Sind :—

(1) Physiological	2,63,945	12	10			2,63,945	12	10	
(2) Jassid investigation	15,468	13	6			15,468	13	6	
(3) Black-headed Cricket	9,245	1	3			9,245	1	3	
(4) Production of long staple cotton	1,34,619	13	10	94,991	12	11	2,20,610	10	9
(5) Bollworm investigation and clean-up campaign	65,132	15	0	42,107	0	0	1,07,239	15	0

(0) Manurial trials in Sind .. .. .	....	9,962 15 0	9,962 15 0.
Total ..	4,88,412 9 2	1,47,061 11 11	6,35,474 5 1
(viii) <i>Burma</i> :—			
(1) Capital Expenditure	2,906 15 5		2,906 15 5
(2) Cotton Improvement	47,790 3 9		47,790 3 9
Total ..	50,697 3 2		50,697 3 2
(ix) <i>Hyderabad</i> :—			
(1) Botanical	4,20,278 8 8		4,20,278 8 8
(2) Cotton Survey	36,578 3 6		36,578 3 6
(3) Pink & Spotted Bollworm ..	83,976 10 4		83,976 10 4
(4) Improvement of Kumpta cotton	76,253 1 10		76,253 1 10
(5) Inclusion of Northern & Westerns in Dry Farming Scheme at Raichur ..	2,000 4 0		2,000 4 0
(6) Pink & Spotted Bollworm Clean-up Campaign	53,950 8 0		53,950 8 0
(7) Improvement of cottons of the Oomras tract	71,321 6 1	7,417 10 0	78,739 0 1
(8) Gaorani Improvement Scheme	849 0 0	64,652 3 3	63,803 3 3
Total ..	7,43,509 10 5	72,069 13 3	8,15,579 7 8
(x) <i>Bikaner</i> :—			
Bengals Cotton Improvement Scheme	70,377 10 11		70,377 10 11
(xi) <i>Baroda</i> :—			
(1) Root Rot	92,335 12 9		92,335 12 9
(2) Comparative tests	4,251 5 3		4,251 5 3
(3) Survey of Goghari cotton ..	3,891 14 7		3,891 14 7
(4) Plant Fuller Propaganda ..	32,533 15 10		32,533 15 10
(5) Mathio cotton at Amreli and Jagudan	57,451 7 5		57,451 7 5
Total ..	1,90,464 7 10		1,90,464 7 10
Carried over ..	2,04,56,252 4 1	27,53,416 0 0	2,32,00,668 4 1
Carried over ..	1,22,03,243 4 1	11,56,252 5 9	1,33,59,495 9 10

Balance Sheet as at 31st March 1948.—(Contd.)

RECEIPTS.					
Cotton Cess.		Cotton Fund.		Total.	
Rs.	a. p.	Rs.	a. p.	Rs.	a. p.
Brought forward ..	2,04,56,252 4 1	27,53,416 0 0	2,32,09,668 4 1		

EXPENDITURE.					
Cotton Cess.		Cotton Fund.		Total	
Rs.	a. p.	Rs.	a. p.	Rs.	a. p.
Brought forward ..	1,22,03,243 4 1	11,56,252 5 9	1,33,59,495 9 10		

(xii) Bengal :—

(1) Comilla Scheme	49,086 13 7		49,086 13 7
(2) Cultivation of long staple cotton	6,273 0 0	7,439 11 3	13,712 11 3
Total	49,959 13 7	7,439 11 3	57,399 8 10

(xiii) Mysore :—

Doddahathi Cotton	28,013 11 0	18,740 14 0	46,754 9 9
(xiv) Collection of Iran cotton	3,121 12 0		3 121 12 0

(xv) <i>Baluchistan</i> :—Coordination of Research on Black-headed Cricket in Sind & Baluchistan	22,608 5 5	17,173 1 0	39,781 6 5
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(xvi) <i>Nawanagar</i> :—Preliminary scheme	323 12 4		323 12 4
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(xvii) Estimation of effects on cotton crop of the use of plant Puller	4,143 12 5		4 143 1 5
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(2) SEED DISTRIBUTION & EXTENSION SCHEMES.

(1) *Bombay* :—

(1) Hubli	44,048 8 3		44,048 8 3
(2) Gadag	41,700 15 1		41,700 15 1
(3) Gadag (Supplementary)	20,167 11 4		20,167 11 4
(4) Surat	93,634 1 4		93 634 1 4
(5) Athani	18,086 1 7		18,086 1 7
(6) Khandesh (Banilla)	1,65,580 4 0		1,65,580 4 0

(7) Khandesh (Jarfla)	2,48,621	1	3	8,737	4	0	2,52,408	5	3
(8) Deccan Canal (Banlla)	3,333	3	4				3,333	3	4
(9) B. D. 8	40,662	2	6				40,662	2	6
(10) Revised Jayawant & Gadag No. 1	2,32,623	4	11	6,824	2	8	2,39,447	7	7
(11) Maintenance of nucleus of pure seed of improved varieties of cotton	9,664	6	8				9,664	6	8
(12) Scheme for control of selection 1A cotton	4,965	10	0				4,965	10	0
(13) 1027 A L.F. cotton in Nawapur Taluka	5,525	10	0	1,898	14	0	7,424	8	0
(14) Scheme for multiplication of Vijaya cotton	81	1	0	36,813	11	0	36,894	12	0
(15) Wagotar cotton in Ahmedabad District	55	0	0	26,077	8	0	26,132	8	0
(16) Multiplication and Distribution of Suyog cotton .. .. .	....			15,733	14	6	15,733	14	6
Total	9,23,749	0	10	96,135	6	2	10,19,884	7	0

(ii) Madras :-

(1) Pay and allowances of Business Manager, Tiruppur	24,079	13	0				24,079	13	0
(2) Co.2	41,286	2	9				41,286	2	9
(3) H.1	41,070	3	9				41,070	3	9
(4) Maintenance of nucleus of pure seed of improved varieties of cotton	2,715	2	5	5,635	13	9	8,351	0	2
(5) Co.3 in Salem District	55,302	6	0	....			55,302	6	0
(6) Multiplication and Distribution of Karunganni cotton .. .. .	....			10,163	13	0	10,163	13	0
Total	1,65,053	11	11	16,799	10	9	1,80,853	6	8

(iii) Sind :-

(1) Seed distribution	4,15,780	15	10	21,374	11	0	4,37,105	10	10
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Carried over .. 2,04,56,252 4 1 27,53,416 0 0 2,32,09,688 4 1

Carried over 1,38,15,948 4 2 18,32,895 11 11 1,51,48,844 0 1

Balance Sheet as at 31st March, 1948.—(contd.)

RECEIPTS.								
Cotton Cess.		Cotton Fund.		Total.				
Rs.	a. p.	Rs.	a. p.	Rs.	a. p.			
Brought forward..	2,04,56,252	4	1	27,53,416	0 0	2,32,09,688	4	1

EXPENDITURE.										
Cotton Cess.		Cotton Fund.		Total.						
Rs.	a. p.	Rs.	a. p.	Rs.	Pa.	P.				
Brought forward ..	1,38,15,948	4	2	13,42,895	11	11	1,51,48,844	0	1	
(iii) Sind :—(contd.)										
(2) Maintenance of nucleus of pure seed of improved varieties of cotton	9,862	13	5	....			9,862	13	5
(8) Financing of seed distribution	1,08,965	12	0	29,404	13	0	1,38,370	9	0	
Total	5,34,559	9	3	50,770	8	0	5,85,339	1	3	
(iv) Hyderabad—Seed Scheme	51,307	13	3				51,307	13	3	
(v) Central Provinces & Berar :—										
(1) Maintenance of nucleus of pure seed of improved varieties of cotton	3,260	7	0				3,260	7	0	
(2) Jarila seed distribution scheme	1,716	4	0	2,104	0	0	3,820	4	0	
Total	4,976	11	6	2,104	0	0	7,080	11	6	
(vi) Baroda :—										
(1) Navsari seed scheme	34,535	1	4	3,062	8	0	38,497	9	4	
(2) B. D. 8	17,642	5	9				17,642	5	9	
(3) B. 9	20,441	9	2				20,441	9	2	
(4) Scheme for creation of a pure Wagad cotton zone in Mehsana district				10,393	12	0	10,393	12	0
(5) Vijaya scheme				1,11,337	7	0	1,11,337	7	0
(6) Suyog cotton scheme				49,872	0	0	49,872	0	0
(7) Wagotar Cotton Scheme	—55	0	0	11,162	12	0	11,107	12	0	
Total	72,564	0	3	1,86,728	7	0	2,59,292	7	3	

(vii) <i>Lydulpur</i> —Ginnery	16,098	3	3	16,098	3	3
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(viii) *United Provinces* :—

(1) C.402	18,616	11	6	18,616	11	6
(2) Perso-American cotton in Western districts	59,147	10	0	59,147	10	0
Total	77,764	5	6	77,764	5	6

(ix) *Mysore* :—

Multiplication and distribution of Selection 69 M. A. V.			1,374	15	0	1,374	15	0
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(3) *MARKETING SCHEMES.*

(1) Grading and marking of 1027 A. L. F. in Surat area	7,467	10	3	11,166	0	0	18,633	10	3
(2) Punjab cotton marketing survey	7,214	1	6	.....			7,214	1	6
(3) <i>Baroda</i> : Better marketing of 1027 A. L. F.	15,082	0	10	.....			15,082	0	10
(4) Extension and marketing of V.484 in Central Provinces	8,61,662	5	4	3,417	0	0	3,64,979	5	4
(5) Distribution and marketing of Buri 107 cotton in Burhanpur Tahsil	24,429	0	0	.....			24,429	0	0
(6) Distribution and marketing of Jarla cotton	—1,105	5	0	22,819	5	6	21,714	0	6
Total	4,14,699	12	11	37,402	5	6	4,62,002	2	5

(4) *MISCELLANEOUS SCHEMES.*

(1) Compilation of manurial trials	719	15	0	.....			719	15	0
(2) Compilation of handbook dealing with pests and diseases of cotton in the Empire	2,975	5	0	.....			2,975	5	0
(3) Survey of nutritional values in relation to milch buffaloes of fuzzy cotton seed and cotton seed cakes manufactured from such seeds	7,345	5	11	.....			7,345	5	11
Total	11,040	9	11	.....			11,040	9	11

Carried over .. 2,04,56,252 4 1 27,53,416 10 0 2,32,09,688 4 1

Carried over 1,94,75,054 4 0 15,89,930 4 5 2,10,64,934 8 5

Balance Sheet as at 31st March, 1948.—(contd.)

	RECEIPTS.					
	Cotton Cess.		Cotton Fund.		Total.	
	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.
Brought forward	04,56,252	4 1	27,53,416	0 0	2,32,00,688	4 0

	EXPENDITURE.					
	Cotton Cess.		Cotton Fund.		Total.	
	Rs.	a. p.	Rs.	a. p.	Rs.	a. p.
Brought forward	1,94,75,054	4 0	15,80,930	4 5	2,10,64,984	8 5

III. TECHNOLOGICAL RESEARCH.

(1) *Technological Laboratory* :—

(a) *Capital Expenditure* :—

(1) Land & Buildings	4,07,988	14 6	.....	4,07,988	14 6
(2) Machinery	1,23,212	1 2	.....	1,23,212	1 2
(3) Freight	7,502	2 8	.....	7,502	2 8
(4) Apparatus & Equipment ..	40,865	15 7	1,302 6 0	41,668	5 7
(5) Machinery & Workshop ..	7,091	14 3	.....	7,091	14 3

(b) Working Expenses 38,58,214 10 2 38,58,214 10 2

(2) Provincial 3,54,747 3 0 3,54,747 3 0

(3) Development of alternative uses of Indian cotton 58,056 12 11 58,056 12 11

(4) Investigation for Improvement in the ginning of Indian cotton

(a) Capital Expenditure 34,072 13 9 34,072 13 9

(Working Expenses 12,920 10 0 29,573 8 6 42,404 2 6

(5) Research on chemical finishes on short staple cotton yarn and fabrics 9,360 0 0 9,360 0 0

(6) Scheme for conducting experiments on storage of cotton lint 1,146 10 3 24,339 1 9 25,485 12 0

Total .. 49,05,819 12 3 64,575 0 3 49,69,894 12 6

IV. RESEARCH STUDENTSHIPS.	2,82,566	1	4	....	2,82,566	1	4
Less:—Refunds from Dr. Taskhir Ahmad	—3,843	10	0	....	—3,843	10	0
Total ..	2,78,722	7	4	....	2,78,722	7	4
By Suspense account	31,282	6	2	....	31,282	6	2
By Balance	6,57,859	4	2	10,98,910	11	4	17,56,769
							15
							6

GRAND TOTAL ..2,04,56,252 1 27,53,416 0 0 2,32,09,68814

GRAND TOTAL .. 2,04,56,252 4 1 27,53,416 0 0 2,32,09,688 4 1

Balance Sheet as at 31st March, 1948.

Provident Fund Account.

RECEIPTS.				EXPENDITURE.						
	Rs.	a. p.	Rs.	a. p.		Rs.	a. p.	Rs.	a. p.	
Subscribers' Contribution account ..	3,36,517	3	9		By advance to subscribers	1,73,656	4	0		
<i>Less</i> :—Payments made to subscribers resigned	3,18,406	11	11		<i>Less</i> :—Recoveries made	1,44,570	6	0		
				3,18,110	7	10		29,085	14	0
Committee's contribution account ..	6,22,490	13	10		Interest accrued on Government paper up to 31-3-1948			196	0	0
<i>Less</i> :—Payments made to Subscribers resigned and forfeitures for Committee's contributions disallowed	3,09,642	3	7		By Balance			6,82,911	3	2
				3,12,848	10	3				
Lapse and Forfeiture account (including profit on securities sold)	69,514	3	5							
Investment Fluctuations account ..	3,017	1	0	72,531	4	5				
Interest account	8,872	2	8							
<i>Less</i> :—Payments made to subscribers resigned	1,624	3	0							
				7,247	15	8				
Suspense account				1,454	11	0				
Total ..	7,12,193	1	2		Total ..	7,12,193	1	2		

APPENDIX V.

STOCKS OF INDIAN COTTON ON 31st JANUARY, 1948, HELD BY THE MILLS AND THE TRADE IN MADRAS PROVINCE.

(In thousand bales of 400 lbs. each.)

Trade descriptions of cotton.	MILL STOCKS ON 31st JANUARY					TRADE STOCKS ON 31st JANUARY					TOTAL STOCKS ON 31st JANUARY				
	1944.	1945.	1946.	1947.	1948.	1944.	1945.	1946.	1947.	1948.	1944.	1945.	1946.	1947.	1948.
Tinnevellies	17	37	32	47	33	18	23	8	31	8	35	60	40	78	41
Salems	19	..	..	..	..	4	6	5	..	2	23	6	5	..	2
Cambodias	83	83	58	126	76	49	70	15	31	34	132	153	73	157	110
Northerns & Westerns ..	15	19	25	18	23	26	13	94	77	21	41	32	119	95	44
Cocanadas	3	1	5	1	2	19	19	20	2	12	22	20	25	3	14
Outside Cottons.. ..	84	66	84	80	64	5	2	1	3	2	89	68	85	83	66
Total ..	221	206	204	272	198	121	133	143	144	79	342	339	347	416	277

APPENDIX VI.

INDIAN RAW COTTON CONSUMED IN INDIAN MILLS

(Based on returns made under the Indian Cotton Cess Act, 1923, by mills in British India,* and on voluntary returns from mills in Indian States.)

Cotton Year : 1st September to 31st August

(In bales of 400 lbs. nett.)

	1933-34.	1934-35.	1935-36.	†1936-37.	1937-38.	1938-39.	1939-40.	1940-41.	1941-42.	1942-43.	1943-44.	1944-45.	1945-46.	1946-47.	1947-48.‡
Bombay Island	491,709	687,287	664,199	636,720	782,815	750,317	634,149	982,084	1,057,745	1,270,766	1,199,172	12,23,679	1,124,072	8,42,024	1,006,279
Ahmedabad	373,345	326,558	320,982	304,398	346,269	346,375	305,459	341,800	414,870	364,999	428,677	401,544	983,274	296,330	390,086
Bombay Province	1,003,549	12,30,616	1,189,310	1,128,744	13,53,998	1,316,313	11,72,285	1,580,079	1,764,339	1,939,423	1,906,606	1,910,619	1,769,283	13,65,750	1,644,408
Madras Province	278,060	312,164	365,423	412,268	422,573	480,839	507,391	525,611	594,054	647,407	596,585	603,796	566,173	455,330	508,265
United Provinces	277,230	292,424	317,011	299,073	288,320	356,331	349,340	381,025	427,305	437,441	414,210	410,606	369,018	299,506	343,187
Central Provinces and Berar.	112,060	125,014	130,298	122,987	140,587	164,616	142,868	163,825	178,791	174,385	148,020	169,727	156,116	142,573	158,742
Bengal *	107,633	101,101	98,892	79,944	92,546	90,611	111,383	135,227	125,740	136,098	133,203	135,697	128,731	100,795	111,279
The Punjab and Delhi*	71,939	83,897	89,430	93,886	94,742	133,347	165,274	171,852	179,987	182,104	184,950	181,384	167,948	143,936	90,117
Rest of British India*	35,139	38,575	38,010	35,823	46,340	49,806	44,867	47,316	64,304	59,003	52,242	52,291	53,894	49,809	47,055
Total—British India*	1,946,210	2,183,791	2,228,374	2,172,725	2,445,606	2,591,863	2,493,408	2,994,735	3,335,020	3,675,861	3,440,816	3,464,110	3,211,163	2,557,759	2,903,053
Total—Indian States	390,116	428,341	449,314	460,080	554,003	559,202	556,693	622,412	690,375	730,970	673,645	694,654	659,859	593,093	670,154
TOTAL-INDIA	2,336,326	2,612,132	2,677,688	2,632,785	2,999,609	3,151,065	3,050,106	3,617,147	4,025,395	4,306,831	4,119,461	4,158,664	3,871,022	3,150,852	35,73,207

† From April 1937, figures for Burma have been excluded.

N. B.—From 15th August 1947, figures for Pakistan have been excluded.

* Relate only to Governor's and Chief Commissioner's Provinces of the Dominion of India from the 15th August, 1947.

‡ In bales of 392 lbs. net.

INDIAN RAW COTTON CONSUMED IN MILLS IN INDIAN STATES.

(Based on voluntary returns from mills in Indian States).

Cotton Year 1st September to 31st August.

(In bales of 400 lbs. nett.)

	1933-34.	1934-35	1935-36.	1936-37.	1937-38.	1938-39.	1939-40.	1940-41.	1941-42.	1942-43.	1943-44.	1944-45.	1945-46.	1946-47.	1947-48.†
Hyderabad	33,231	45,588	51,771	49,981	63,093	68,156	67,995	72,860	83,725	83,689	73,204	71,640	67,458	52,040	70,983
Mysore	47,168	51,196	50,824	53,236	55,244	53,858	67,851	65,062	74,966	77,734	57,718	73,688	79,073	71,801	68,581
Baroda	53,612	57,146	51,963	51,761	70,686	73,278	65,573	91,519	90,642	87,542	83,628	81,964	81,845	54,249	70,287
Gwalior	49,362	56,318	72,163	70,079	89,243	94,090	88,688	95,517	94,300	90,025	93,152	87,485	78,709	70,276	78,244
Indore	111,430	114,229	113,379	106,454	147,766	140,792	129,186	138,795	148,867	149,914	144,147	154,429	141,953	137,308	141,836
Kathiawar States	20,506	35,438	37,397	42,717	48,545	44,109	43,703	50,479	60,628	72,857	70,577	71,184	69,292	61,123	63,081
Other Indian States	45,197	45,735	51,462	57,767	57,119	58,444	102,702	103,180	137,247	169,209	146,219	154,164	141,529	146,293	166,087
Vondherry	23,610	22,091	20,355	19,065	22,307	26,475									
Total—Indian States ..	390,116	428,341	449,314	460,060	554,003	559,202	556,698	622,412	690,375	730,970	6,78,645	694,554	659,859	5,93,093	670,111

LOOSE (UNPRESSED) INDIAN RAW COTTON RECEIVED‡ IN MILLS IN BRITISH INDIA††

(Based on voluntary returns furnished by mills).

Cotton year 1st September to 31st August.

(In bales of 400 lbs. nett.)

	1933-34	1934-35	1935-36.	†1936-37.	1937-38.	1938-39.	1939-40.	1940-41-	1941-42.	1942-43.	1943-44	1944-45.	1945-46.	1946-47	1947-48.†
Bombay Province	74,868	53,355	75,617	67,219	74,750	80,164	86,687	96,215	102,965	81,6439	54,415	33,072	25,092	19,748	18,461
Madras Province	110,875	123,260	147,044	173,102	156,675	169,489	175,540	189,257	230,691	241,751	202,405	208,300	180,379	139,710	132,049
United Provinces	17,871	10,090	10,405	10,659	15,719	17,532	20,279	29,127	20,293	5,024	4,037	793	1,125	560	6,755
Central Provinces and Berar.	18,332	20,544	27,502	26,321	32,860	26,980	20,052	32,589	31,178	19,163	7,366	3,893	6,639	3,177	4,336
Bengal * .. .. .	..	..	..	90	..	..	3	..	..	433	5,000	6,017	4,337	1,855	2,503
The Punjab and Delhi † .. .. .	..	5,535	3,110	28,385	23,873	25,960	33,079	28,627	30,936	22,638	15,319	16,903	13,054	7,359	..
Rest of British India * .. .. .	..	..	..	19,282	17,160	22,916	12,734	15,529	21,230	6,804	4,942	7,441	3,389	9,601	6,887
Total—British India ..	221,908	217,784	263,678	325,058	321,037	336,041	357,374	391,344	443,393	377,496	293,534	276,424	255,335	182,005	165,991
Indian States * .. .. .	..	..	..	131,140	109,003	122,078	116,962	131,657	118,660	83,372	78,882	59,800	47,204	41,644	54,121
Total—INDIA * ..	..	..	..	456,207	430,040	458,119	474,336	523,001	562,053	460,868	372,416	336,233	282,539	223,649	220,112

* Figures up to 1935-36 not compiled.

† Figures up to 1935-36 exclude Delhi.

‡ From 1936-37 the figures refer to consumption and not receipts and are based on returns furnished under the Indian Cotton Cess Act, 1923, by mills in British India and on voluntary returns from mills in India States. From April 1937, figures for Burma have been excluded.

N. B.—Excludes Pakistan from the 15th August 1947 †† Relates only to Governor's and Chief Commissioner's Provinces of the Dominion of India from the 15th August, 1947.

¶ In bales of 392 lbs. net.

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