

Modern Trends in Cotton Production and Research in India

by N. KESAVA IYENGAR,
Cotton Specialist, Coimbatore.

India, at present, is the second largest cotton growing country in the world being only next to the U. S. A., in acreage. In production, however, it takes the third place, the first and second ranks being occupied by the U. S. A. and the U. S. S. R., respectively. As estimated from the figures of 1954-'55, the area under cotton in India is 18.3 million acres and the production is placed at 42.98 lakh bales. Towards the world's totals, the country contributes about 23.7% in acreage and 11.5% in production.

Owing to World War II and partition of the country in 1947-'48 a great shortage of cotton production was created in India, while the demand for raw cotton continued to increase since almost all the mills were located in the Indian Union itself and further development of more mills caused increase in spindlage. Therefore, urgent steps were taken to increase the area and production of cotton in the country to achieve self-sufficiency and save foreign exchange. The "Grow More Cotton Scheme" was launched by the Government of India in 1950-'51 and all the cotton growing states were requested to take part and targets were fixed for the country and every State. The scheme was incorporated in the First Five Year Plan in 1951-'52. The targets fixed were 18 million acres and 42.29 lakh bales. Since then steps were taken to increase the area and production as per the items fixed in the plan and a steady increase in area and production was achieved as seen below :

Year	Area in million acres.	Production in lakhs of bales (of 392 lb. lint)			Total
		Long staple (7/8" and above).	Medium staple (below 7/8" and above 11/16").	Short staple (11/16" and below).	
1950-'51	14.55	6.84	14.48	8.39	29.71
1951-'52	16.20	9.18	12.23	9.92	31.33
1952-'53	15.69	9.05	13.95	8.31	31.31
1953-'54	17.18	14.20	16.62	8.83	39.65
1954-'55	18.35	15.87	18.86	8.25	42.98

Year	Production in lakhs of bales (of 392 lb. lint)				
	Area in million acres.	Long staple (7/8" and above).	Medium staple (below 7/8" and above 11/6").	Short staple 11/16" and below).	Total
Average	—	11.03	15.23	8.74	35.00
1950—'55	—	(32)	(43)	(25)	
1945—'50	—	3.83	11.48	7.21	22.52
		(17)	(51)	(32)	
1940—'45	—	6.19	14.61	15.26	36.06
		(17)	(41)	(42)	

N. B : The figures in brackets give the % on total production.

It is seen that the targets, both in area (18.35 lakh acres) and in production (42.98 lakh bales) have been achieved even one year ahead of the completion of the plan period in 1955—'56. It is also seen that in the matter of production, there is considerable increase in long and medium staple cottons and the percentage of short staple cotton to the total production is very much reduced. The contribution of Madras State for 1954—55 is 8.72 lakh acres and the 2.71 lakh bales, in the plan period.

The target fixed under the Second Five Year Plan ending with 1960—61 for the Indian Union is 20.4 million acres and 55.86 lakh bales, the share of the Madras State being 11.74 lakh acres and 5.57 lakh bales. It is thus seen that the trend of cotton improvement is towards self sufficiency in the First Plan period by expanding the area under cotton and increasing production.

At present India is importing about 6 to 7 lakh bales of long staple cotton from Egypt, Sudan, East-Africa, Peru and the U. S. A. During 1951—'52, a quantity of 12.40 lakh bales was imported and this figure has declined to 6.20 lakh bales in 1954—'55. The Government of India is now permitting to import only cotton of a staple length of 1-1/16 inch. As regards exports, since they are subject to quota allotment, only certain short medium staple cottons are allowed to be exported, like Bengal *Deshi*, Oomra *Deshi*, Mathio, Cocanadas etc., to countries like United Kingdom, U. S. A. Europe etc. The export in 1951—'52 was 1.99 lakh bales and 3.19 lakh bales in 1954—'55 and varied from year to year.

As regards the mill consumption of cotton the trend was as follows:

Year	Lakh bales	
	Indian cotton	Foreign cotton
1951—52	29.54	11.34
1952—53	35.90	8.89
1953—54	38.60	7.53
1954—55	41.24	6.46

The trends are for consumption of greater quantities of Indian cotton and there is a steady decline in consumption of foreign cotton. Of late, loose cotton is being consumed by mills and the trends show increase in consumption from 2.61 lakh bales in 1952-53 to 3.59 lakh bales in 1954-55. In Madras State there is large consumption of loose cotton and in 1954-55 it was 2.05 lakh bales as against 1.50 lakh bales in 1953-54.

The most important trend in the increase of production is the yield of cotton per acre. As it may not be possible to increase the area indefinitely, the only possibility lies in adopting the measures which gives greater yield per unit area. In India cotton is mostly grown as a rainfed crop and the yields of the crops grown on varying types of soils and rainfall are subjected to vagaries of the monsoon. As against a total area of 18.3 million acres the area under irrigated crop is only 1.7 million acres. Attempts are therefore being made to increase the area under irrigated cottons. The average yield of irrigated cotton in India is estimated to range from 200-250 lb. of lint per acre and in the unirrigated crop it ranges from 60 to 100 lbs. When compared to the yields of U. S. A. with 300 lb. lint per acre and Egypt with 700 lb. per acre the overall yield of 93 lb. per acre is too low. Attempts are therefore being made to improve the yield per acre by distribution of seeds of improved varieties, application of manure, irrigation, adoption of improved cultural practices and control of pests and diseases. By such method the yields of lint have increased from 93 lb. to 116 lbs. per acre, in 1954-55. It may be stated that out of 18 million acres of cotton in India about 9.4 million acres (52%) are covered by improved seed in 1954-55. This is expected to contribute an extra quantity of about 23,500 bales if we reckon that improved seed gives 10 lbs. of extra lint per acre.

The estimated extra income earned by the growers was Rs. 1412.4 lakh. In Madras State about 65% of the area was covered by improved seed and 225 lakhs of Rupees was realised as extra income.

Another important trend in the production of cotton was to switch over large areas from the unremunerative short stapled '*deshi*' to more remunerative and adaptable varieties of American cotton. This is particularly possible in recent years as there is increased scope of irrigation and suitable varieties of American cotton are available for cultivation as unirrigated crop. Such advances are seen in Punjab, Bombay, Madhya Pradesh and Madras. American varieties like Cambodia 2, Madras Uganda 1, P. 216F. Laxmi 134-Co. 2-M, 0394 are now grown in these respective states both as rainfed and irrigated crops. In Madras, out of three and half lakhs of acres under Cambodia about 1.5 lakh acres are grown as unirrigated crop in Salem, parts of Coimbatore, Madurai, South Arcot etc. Tracts receiving adequate rainfall and lighter soils are suited for such cultivation.

On the research side, great importance is attached to improvement in quality and yield per acre of cotton, in order to enable the cultivator to get the maximum cash return per acre. Notable achievements have been made in all the cotton tracts of the country and progressive improvements shown as a result of the tireless efforts of the breeder. As a result the quality and yield (particularly the ginning percent) of cotton are changed from the original short staple, low ginning cotton with low spinning value to one of long and medium staple cotton, with a higher ginning and better spinning cottons. The duration of the crop was much reduced and the loss from pests and diseases considerably minimised by the evolution of resistant varieties. Great encouragement is being given for the evolution of extra long staple American cottons and special purpose cottons like Sea Island to reduce the imports of foreign cotton.

In Madras, the character of both the American and *deshi* cottons was considerably changed as a result of progressive improvement. In the case of the American cotton, the original Cambodia with a ginning percent of 32, a staple length of 7/8" and spinning 30 counts was changed to one possessing a ginning percent of 35, a staple of 15/16" and 34 counts with the evolution of Cambodia 2. This hardy jassid resistant strain was responsible for its rapid spread even as an unirrigated crop and replaced the original inferior *deshi* cottons. Further efforts of the breeder finally led to the evolution

of Madras Cambodia Uganda 1 (known in trade as Rajapalayam) in summer areas of the Southern districts of the state. This strain had a ginning percent of 36, staple length of one inch or more and capable of spinning 44 counts. On account of its shorter duration of six months it gained rapid popularity in the summer area for growing under wells in rice lands and on account of its superior quality and shorter duration it also became popular in the winter Cambodia area and gradually replaced Cambodia 2. Thus, it was possible to bring the entire Cambodia area of about 3.5 lakh acres under one cosmopolitan strain. In trade, this cotton gained great reputation and the consuming mills were able to get greater quantities of long staple cotton. As this variety is placed outside price control by Government of India on account of superior length of one inch and over, the cultivators were benefitted by higher valuation, particularly for the certified produce. Further achievement in the direction of quality and earliness resulted in the release of Madras Cambodia Uganda 2, for the summer area, which gained rapid popularity on account of its earliness by a fortnight, higher yield, a staple length of 1-1/16" and a spinning value of 50 counts. This replaced M. C. U. 1 very rapidly. Improvement in staple length and ginning percent is in progress and strains like 9030, which are capable of spinning 50 counts, with a ginning percent of 38 and resistant to pests like pempheres and jassids are being made available for the winter area to replace Madras Cambodia Uganda 1. In the summer area selections like Lo-315, Lo 313, 0484 etc are available and these possess staple length over 1-1/16" and are capable of spinning 50 counts or more, with good strength.

Quality improvements with better ginning value have been made in the *deshi* cottons of the state. The inferior Uppam with low ginning of 23 to 25% and poor spinning value of 12 to 16 counts was almost eliminated and the local Tinnevellys were replaced by Karunganni strains. The position of local Karunganni with a ginning percent of 30, staple length of less than 7/8" and 24s was improved with the release of Karunganni 2 and Karunganni 5, which are superior in ginning by 1 to 2 percent. The staple length was pushed up to 15/16" level and the spinning to 29 to 30 counts. Further improvement in wider range of adaptability, resistance to diseases, better yield, ginning percent, staple length and spinning resulted in the evolution of a new strain 6186-9 which proved to be superior to both Karunganni 5 and Karunganni 2 in all respects. It possessed a ginning percent of 33, a staple length of nearly an

inch and a spinning value of 34 to 36 counts. Thus, it was possible to recommend a cosmopolitan strain in the *deshi* cotton also for the unirrigated tracts of the state.

Quality improvement associated with other factors like ginning, earliness, resistance to pests and diseases have also been achieved in other states. The L. L. types, P. 216F and H. 14 in Punjab; 134-Co. 2H and 170-Co. 2 obtained from interspecific crosses of Asiatic American Cottons in Bombay; 394 of Madhya Pradesh, M. A. 5 in Mysore, Gaorani strains of Hyderabad, etc have all contributed towards the improvement in quality of the Indian cotton. The attempts to introduce special purpose cottons like Sea Island Cambodia x Sea Island hybrids will also go a long way in reducing the import of extra long staple cottons.

Like the other parts of the World, the question of improvement of cotton by transferring desirable qualities from the wild cottons to the cultivated varieties is engaging the attention of cotton breeder in India. Wild cottons like *G. anomalum*, *G. thurberii*, *G. raimondii*, *G. armourianum* are useful to bring desirable qualities like resistance to pests, diseases and drought, fineness of lint, strength of fibre etc. Such long range work is proposed to be included in the programme of the All India Regional Research Stations to be established in the country very shortly.

In the Second Five Year Plan it is proposed to export cotton and earn foreign exchange. The question of increasing the production of harsh cotton in the country for export to foreign market is engaging the attention of the Government of India. As this cotton fetches as much price as the quality cottons like 'Rajapalayam' and as there is great demand for this cotton in foreign countries for various industrial uses, the cultivators will stand to benefit by growing such cotton in suitable areas.

At present, cotton seed is almost exclusively utilised for cattle food and the cotton seed is therefore not given the due value it deserves. In the U. S. A., the seed is crushed and the by-products obtained like cotton seed-oil, cake, etc., are utilised for various industrial uses and the cake is fed to cattle, utilised as manure etc. In the valuation of cotton seed the oil value is considered and better values are offered. Crushing of cotton seed to extract oil has commenced in India in the recent years in Punjab, Madhya Pradesh and other places and researches are in progress to assess the oil value

of various cottons. Likewise, linters are extracted by special machines in the U. S. A. and the same is utilised for various purposes. In India, such machines are just being tried. Thus the cultivation of cotton not only benefits the growers by supplying raw cotton in the shape of lint but better monetary returns are obtained by enhancing the value of seed on the basis of oil-content, linter value etc. In Madras, the cultivation of cotton in rice fallows, has shown possibilities of getting about 7000 lbs. of supplementary organic matter, in the shape of plant residue, to the succeeding paddy crop, in addition to lint and cotton seed.

Other recent developments like organising co-operative societies to multiply seed of improved varieties on large scale and distribution of the same to the cultivators, establishment of small gin units in the villages to enable the cultivators to get the cotton seeds readily and easy transport of lint to the distant market centres, establishment of regulated cotton markets to benefit the cultivators to get fair price for their produce, are in progress in the various States.

In order to protect the quality of cotton, control the movement of cotton, and price of cotton, to prevent malpractices like deliberate watering, bad ginning, legislations like cotton Transport Act, Cotton Control Act, Market Act, Ginning and Pressing Factories Act etc., are being introduced in States where such provisions do not exist, in the larger interests of the cultivators, trader, and manufacturer.

From the foregoing accounts it is seen that the trends in cotton in India is on the progressive side and there is every hope that ere long India will occupy the foremost rank, not only in area, but in production, and quality as well and above all in bringing a much larger income to the cultivator and also in helping the country in earning foreign exchange by the export of raw cotton, cloth, yarn and cotton seed products.