Methods to be Adopted to Maximise Production and Development of Improved Strains and Plant Materials with Special Reference to Cotton — Statistics Gingely Forecast *

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From the point of Agriculture, maximum crop production is aimed by all the growers. Great attention is paid to increase the yields and attain the maximum by such agronomic practices like 'time of sowing', rotation etc; by evolution or introduction of high yieldings disease resisting varieties; by plant protection measures; br manuring; by bringing as much area as possible under irrigation; by the introduction of short duration high yielding varieties and trying to fit in the maximum number of crops in a calendar year; by enacting suitable legislation either to follow certain practices compulsorily or to prevent spread of disease or pests, or to discourage the multiplication of inferior or undesirable types to prevent malpractices etc.

In the present paper the authors propose to confine themselves to cotton crop of the Madras State, particularly from the extension point of view.

Cotton shortage in India: With the shortage of food crops created by the extension of hostilities to South East Asia in 1941, emergent measures were taken up to increase the internal food production of India under "Grow More Food Campaign". As a result of the above plan, legislation curtailing the area under cotton and executive orders controlling the prices of Indian cotton were promulgated. Other factors like closing of Japanese Market and competition of more remunerative cash crops like groundnuts, chillies and tobacco also stood in the way of cotton cultivation and as such both the area and production of this crop dwindled down rapidly from the pre-war levels in India as a whole. The situation was further aggravated with the erstwhile partition of the country in 1947, by which 33 lakhs of acres produceing nearly 16 lakhs of bales of long and medium stapled cotton was lost. The Indian Mills which required badly the above styles, therefore, suffered severely. By 1950, the number of mills in the Indian Union also steadily increased to 425 and in 1951 it was 445. The carryovers of both long and medium stapled cotton were rapidly consumed at an alarming level and a wide

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gap was created between supply and demand which was estimated at 20 lakhs of bales. This situation lead to part-time working or even to closure of mills. The Indian Union was therefore forced to depend upon other countries like Pakistan, Africa and U. S. A. for the supply of raw cotton to feed the mills and keep them working full time. Pakistan was not willing to part her cotton on favourable terms and complications also developed in foreign exchange. In the meanwhile the World cotton prices were also steadily mounting up. As such the Indian Union had to spend huge sums amounting to 90 crores of rupees to purchase her raw cotton. About 14 75 lakhs of bales of cotton are expected to be imported during 1951—'52 as against 8·31 lakhs of bales in 1950—'51. Hence ways and means for stepping up the internal production in a short period had to be devised and integrated with food and jute plans in order to avoid serious effects on the economy of the country and pressure on foreign exchange. Against such a background the Government of India launched the Cotton Extension Scheme on "All India Basis" from the year 1950 and allocating definite targets for each State in regard to both area and production.

State concessions offered to encourage cotton cultivation: All executive and legislative restrictions imposed by the States on cotton cultivation were removed. Farmers were assured that every possible facility to irrigate cotton crop would be given. The Government of India agreed to make good the loss in foodgrains arising out of the diversion of land from food to cotton by extra allotments. (This diversion of food crops was, however, given up during the third year of the scheme). Additional technical staff were appointed to advise on cotton cultivation. Full remmission of land revenue was offered to the increased area grown with cotton (This concession was however withdrawn during the end of the second year of the scheme). Loans were granted for the purchase of manures and seeds at subsidized rates and quotas of ammonium sulphate were exclusively set apart for cotton in all the States. The price structure of Indian cotton i. e. increase in ceiling price etc. were also revised and liberalised. Cotton was permitted to be grown in tractor operated lands, under subsidy wells etc. and treated on par with food crops. Restrictions on movement were relaxed and priority for the movement of cotton lint to mills and seeds for sowing were sanctioned by the Railway Board and arrangements were also made regarding the allocation of coal and power to the mills, gin and presses.

Cotton position in Madras and survey of extension work done for the past two years: The area and production of raw cotton in Madras during the pre-war years of 1937—'38 stood at about 25·6 lakhs of acres and 5·0 lakhs of bales, respectively. As already pointed out due to the circumstances caused by the "Grow More Food Campaign" as a result of the extension of hostilities to South East Asia in 1941) and competition of more remunerative cash crops like groundnuts, chillies and tobacco, the

arear under cotton (which was in general relegated to the lands of low fertility) went down to 13·6 lakhs of acres during the partition year of 1947—'48 with a production of only 2·7 lakhs of bales. When the cotton Extension Scheme was launched in 1949—'50 the area and production stood at 16·91 lakhs of acres and 4·48 lakhs of bales. The demand by the mills was roughly estimated at about 7 lakhs of bales.

Unlike the other States of the Indian Union, in Madras, cotton is planted in all the months of the year in one part of the State or the other, being conditioned mainly by the seasonal rains at sowing and harvest or by availability of water for irrigation but not by limitations imposed by low temperature verging on frost as in North India. The major planting period in the State is, however, between August to November, if about twelve percent sown to kharif and two percent sown to summer months are excluded. Cotton is sown both under rainfed and irrigated conditions and in one and the same district both the types of crops are grown in different seasons as in the Masipattam and Western areas of this State. The trade varieties grown are Cambodia, Salems, Tinnevellies, Westerns, White and Red Northerns, Cocanadas, Warangal and Chinnapathi. In general, with the exception of a few, most of the types belong to medium to long stapled group. M. U. 1 or otherwise known as 'Rajapalayam' is the best quality cotton grown in the State which is adjudged suitable to spin 44 warp counts and has a staple length of 1 to 1-1/16 of an inch. The survey of the manurial experiments conducted on "All India Basis" has shown that manuring in Madras State could be safely done both to irrigation and unirrigated cotton crops, with the exception of the unirrigated cotton in Bellary, Anantapur, Cuddapah and parts of Kurnool Districts. All most all the irrigated cotton crops of the State are at present grown under wells and spring channels. With the completion of Tungabhadra and Lower Bhavani Projects about one lakh of acres are expected to be covered by irrigated long stapled Cambodia cotton. In eight out of twenty-four districts, cotton is grown over a negligible area. They are Chingleput, Chittoor, North Arcot, Tanjore, Malabar, South Kanara, West Godavari and Krisha Districts. Cotton is often grown mixed with crops like groundnuts and cereals like korra, arika, ragi in districts like Bellary, Anantapur, Kurnool, Guntur and South Arcot. The area of cotton in such mixture depends upon the extent to which the main crops are sown and the period of rainfall, availability of water in the wells in the case of irrigated crops etc.

The items of Cotton Extension included in the first year's programme and started in June 1950 were (a) area increase through replacement of other crops (b) mixed cropping with groudnuts, chillies, ragi etc. and (c) application of fertilizers and (d) distribution of improved seeds. During the second and third years, other items like reclamation of waste land, double cropping, plant protection measures and improved

cultivation methods are also included in the programme. While preparing the targets, care was taken to see that the food position of the State was not weakened. The programme of rediversion from food crops to cotton was kept at a safe minimum during the first two years and greater emphasis was laid on mixed cropping and intensive cultivation methods. During the third year, the idea of diversion of areas from food crops was completely given up and efforts are being made to increase the production solely by intensive cultivation methods and mixed cropping to the extent feasible. The targets fixed for the various items of extension are given in table I appended for the three years 1950–'51, 1951–'52' and 1952–'53 and Table II gives the achievements for the first two years (data still incomplete for 1951—'52.)

It is seen, that the targets could not be achieved, in full, in both the years. The reasons are as follows:

1. In the first year, the scheme was started only late in June 1950 and sufficient time was not left for making intense propaganda, to procure cotton seeds and distribute the same in the taluks. Large areas of groundnuts were already sown and it was not possible to interplant cotton in the standing groundnut crop due to insufficient moisture in the soil and failure of further rains.

2. Seasonal conditions were extremely unfavourable in both the years due to complete failure of rains for the fourth and fifth year in succession, in many parts of the State. As such, large areas could not be sown to crops and in many areas even the sown crops were wiped out in large bloks in the case of rainfed crops and in the case of irrigated crops large areas were abandoned due to short supply of water in the wells and channels. The smaller cultivators abandoned their lands in large numbers to seek their food in famine relief centres, bigger towns, mines etc. Cattle tresspass also became a serious problem in many places.

3. During 1952, seeds could not be procured in sufficient quantities on account of (a) low yield of cotton crops in 1951, due to failure of rains in the places where seed multiplication schemes were run (b) inadequate premia conceded to Cambodia–2, Karunganni–2 and Karunganni 5 cotttons grown under seedfarm conditions during the peak marketing stages of the crop (c) purchase of seed farm kapas by local licensed dealers at rates considerably above the parity prices for lint, for purposes of adulterating, at a time when there was considerable scramble for the procurement of cotton (d) transport difficulties due to supply of waggons and (e) non-availability of good mungari seeds.

4. Tractors in working condition and in required numbers were not available for reclamation of fallows in many places.

5. Funds sanctioned under Takkavi loans were not readily available with the Collectors for the release of the money for the purchase of seeds and manures.

6. In the non-cotton growing areas adequate marketing facilities were not readily available for the sale of cotton and for getting fair prices they had to move the produce to long distances.

7. Due to cut in power supply and coal shortage the progress of work in the gins and mills were impeded to a certain extent.

8. In the case of chilli-cotton mixture in the Cocanada area, many cultivators were either not aware of the State legislation enforced to grow cotton in chilli crop or by the time they were informed, chilli planting was already over. Moreover, the price of chillies quoted at Rs. 16/- per maund in May-June 1952 suddenly shot up to Rs. 40/- in July and cotton lost its parity with the more remunerative commercial crops.

For implementing the targets the following measures were adopted:

1. Propaganda was intensified during the second year on all items of extension work, by holding meetings in the villages and addressing the cultivators in the regional languages; periodical radio talks were arranged; lantern slides were prepared and distributed to the various districts; leaflets on various topics were printed and distributed. Letters and notes were obtained from the cultivators regarding their impressions and experiences of the various recommendations included in the Cotton Extension Plan and the same were published in the Departmental Journals, in the various regional languages.

2. Improved seeds were procured to the tune of 34,554 maunds in 1950 – '51 and 51,903 maunds were procured in 1951 – '52. The same were distributed to the extent of 28,738 and 42,082 maunds respectively in the two years.

3. As per the information supplied by the tender firms and co-operative Societies, 1,198 tons of Ammonium Sulphate were distributed in 1950 – '51 and during 1951 – '52 (information incomplete) the quantity supplied was 822 tons.

4. Seeds of indigo were supplied at subsidized rates to cover the targetted area of 2,000 acres in Tirunelveli and Ramanathapuram districts for mixing with irungu cholam and to counteract the harmful effect of the fodder cholam crop on the succeeding cotton crop.

5. Under the Plant Protection Scheme, sanctioned separately by this State, pesticides were offered at subsidised rates during 1951 – '52 for protecting the Cambodia cotton over an area of 18,000 acres. To prevent blackarm attack in Cambodia cotton, seeds were recommended to be treated with Agrosan before sowing.

6. For the purposes of intercropping of cotton with groundnuts, ragi and chillies, 4,000 maunds of P. 216F from Punjab, 2,500 maunds of H. 420 from Madhya Pradesh and 400 maunds of Laxmi from Bombay

were imported during 1951 and 2,000 maunds of P- 216F and 2,500 maunds of H. 420 in 1952. The former two are short duration type and come to harvest from 4 to 5 months from the date of planting. All the three types are far superior to local Mungari cotton in quality.

7. Under "Double cropping", a pilot scheme of 500 acres sanctioned separately by the State Government, was run during the summer of 1951 by cultivating P. 216F cotton in the rice fallows of Tanjore. The results showed a great promise. Acre yields varying from 400 to 1200 lbs. of seed cotton were realised and no harmful effect was noticed on the yield of the succeeding 'Kuruvai' paddy but in addition, about 6,000 pounds of green leaf was supplied by the cotton crop. Chemical investigations showed that the fertility of the soil was not lowered by growing cotton. For 1952 programme, 3,000 maunds of P. 216F seeds were specially imported from Punjab for covering an area of about 10,000 acres. The work of providing filter points, pump sets and electric installations were also taken up.

8. For answering the marketing difficulties of the cotton grown in the 'non-cotton growing' areas, agents were pooled at taluk centres and the premium attached to the varieties grown in the Cotton Control Orders were extended.

9. To assess the progress of the area increase, village surveys were undertaken by ascertaining the area in each village sown to cotton in the previous year and in 1951 and 1952.

10. Steps were taken to grant premium to approved varieties of seedfarm cotton. But this grant from the Government of India was received late and most of the seed farm growers had by that time parted with their produce to the private dealers.

11. Procurement of improved seed was further made possible by the institution of a special purchase scheme for Khadi by the State in the Karunganni zone during the middle of the ginning season of 1951 and for the order compelling the certification of all Madras Uganda – 1, to make it eligible for being sold at rates exceeding top ceilings fixed for Cambodia cotton.

12. To prevent the movement of Westerns seed outside the district for cattlefood and keep the price down a ban was imposed.

14. Under reclamation of waste lands, steps were taken to bring areas under cotton after tractor operation. A pilot scheme was run in Salem District in 1950 over an area of 100 acres by growing Karunganni – 5 cotton and supplying the cotton for the Khadi section of the Rural Welfare Department. The scheme was successful and the same was continued in 1952.

Although the targets could not be achieved in full, it is however gratifying to note that in spite of various bottlenecks an increase of 6·8 percent in area was registered in this State as per the recent Fourth Forecast Report of the Economic Adviser and Joint Secretary to Government of Madras. The area upto 28th January 1952 is estimated at 16·433 lakhs of acres as against 15·386 lakhs of acres estimated for the corresponding period of last year. This increase is partly attributed to Cotton Extension Work and partly to the attractive prices offered at the time of sowing for cotton.

Future proposals for increasing the production of cotton in the State under the Extension Plan: (a) *Supply of pure seeds of approved varieties:* One of the important bottlenecks that was experienced by many States of the Union, besides Madras, regarding the implementation of the targets in full, was the short supply of good seeds. In recent years the quality of seeds has in general deteriorated in all the States since all types of cotton are consumed and every grain of seed utilised both for cattlefood and sowing. As a result there is high percentage of impurity in the crop and both yield and quality have suffered. This important question of the supply of pure seed has recently been seriously considered by the Centre and steps are now being taken to supply the maximum quantity of pure and good seeds in all important crops. To answer this shortage of pure seeds and to cover vast areas with good seeds and obtain good yields, adoption of dibbling seeds has been suggested. In the case of cotton, since quality of lint besides yield is an important consideration, every step should be taken to see that an entire zone is covered by an approved quality cotton recommended for the tract, in order to improve the yield and maintain the quality of the standard cotton. Although there are a good number of seed multiplication schemes in this State and each catering to a particular tract, the entire areas have not been completely covered by the improved varieties. With the financial assistance granted by the State and by the Indian Central Cotton Committee, Bombay and by the enactment of the Cotton Control Bill into an Act for enforcing cultivation of improved varieties recommended by the Agricultural Department, it is hoped to cover the entire zone within a very short period by pure seeds of approved varieties. For example, it is proposed to develop a well defined zone for Madras Uganda – 1 in the Central and Southern Districts of the Madras State comprising Coimbatore, Salem, Mathurai, Tiruchirapally, South Arcot, Ramanathapuram and Tirunelveli Districts to the exclusion of all the other inferior Cambodia varieties grown at present in this zone. In this connection, the Certification Scheme at least 95% purity is insisted upon for eligibility and the crop is subject to inspection from the sowing to the harvest stage during the growing period and again at the time of ginning and marketing of lint. By the adoption of the above measures, both the quality of lint and purity of seed are safeguarded. Similar zones are

also being thought of for other improved types viz. Karunganni-5, Westerns-1, Cocanadas-1, and 881F cottons. There are also possibilities of creating zones for the recently introduced P. 216F cotton from Punjab and H. 420 from Madhya Pradesh which are noted for their exceptional earliness in addition to quality and are becoming popular with the cultivators as a result of the Cotton Extension Work.

(b) *Improvement in ginning percent:* Since in the case of rainfed cottons yields cannot be pushed beyond a limit and as they are subject to vagaries of season and rainfall, maximization of yield of lint could only be in the direction of improvement of ginning percent without sacrificing the yield and quality. Compared to the other States, the unirrigated deshi cottons of Madras have in general lower ginning percent values. This improvement is a long range problem and suitable varieties will have to be either evolved or introduced.

(c) *Diversion of area from 'deshi' to American cotton:* Since American cottons in general have better quality than the deshi cottons and as there is a greater demand in the Indian Union for quality cottons, it is highly desirable that as much areas as possible is diverted from deshi to American cottons. This item of work is an important programme in the Cotton Extension Work in States like Punjab. In certain other States like Bombay, nearly one lakh of acres are grown to the popular Laxmi cottons under irrigated conditions and the quality cotton is kept outside price control. In the Madras State, out of a total area of 2·64 lakhs of acres under Cambodia cotton, about 96,500 acres are grown under unirrigated conditions. As a long term plan, with the materialising of the major irrigation works like Tungabhadra and Lower Bhavani Projects and increasing development of minor irrigation works like pump schemes, sinking wells etc. there is a great possibility of increasing the area in this State under irrigated Cambodia cottons where at present unirrigated deshi cottons are grown, by at least another two lakhs of acres. It is also gratifying to note that as a result of the extension work, Combodia cotton is of late becoming increasingly popular even under unirrigated conditions as is instanced by the great demand for Laxmi cotton seeds during this year in parts of Bellary, Anantapur, Cuddapah and Kurnool districts.

(d) *Other considerations:* With the reclamation of greater areas of waste lands by the aid of tractors; by granting loans on liberal terms in time for the purchase of seeds and to meet other cultivetion expenses; by creating a chain of co-operative organizations for marketing, supply of fertilizers etc.; by liberal grant of subsidy to seedfarm growers; by affording greater irrigation facilities and by sustained propaganda, It is hoped that the shortage of cotton in the States will be overcome very soon and the country at large will not only become self-sufficient with respect to her raw cotton but reduce her imports and save foreign exchange to a considerable extent.

TABLE I.

Cotton Extension Scheme — Madras.

(Targets fixed as additional area and production during 1950—'51, 1951—'52 and 1952—'53)

Items of Extension	1950—1951		1951—1952		1952—1953	
	Area in acres	Production in bales of lint	Area in acres	Production in bales of lint	Area in acres	Production in bales of lint
I. *By Extensive Cultivation:*						
(a) By reclamation of fallow land ..	..	..	4,700	600	4,700	600
(b) By replacement of food crops ..	1,00,000	37,500	1,94,050	74,240	..	..
(c) By replacement of other crops ..	..	..	45,000	8,750	45,000	8,750
(d) Double Cropping ..	..	..	14,350@	5,823	14,350@	5,823
II. *By Intensive Cultivation:*						
			No Programme			
(a) Irrigation ..	..	..	..	..	..	..
(b) Inter-cropping ..	5,00,000*	50,000	4,87,925*	48,873	4,50,000*	45,000
(c) Manuring (Application of Ammonium sulphate) ..	56,800	7,500	64,000	7,109	60,000	7,500
(d) Improved seeds ..	1,36,550	4,390	6,70,990	8,534	6,75,000	8,438
(e) Control of Pests and Diseases ..	..	..	18,000	1,500	18,000	1,500
(f) Improved cultivation methods ..	..	..	2,000	..	2,000	100
Grand Total I plus II ..	1,50,000	99,390	2,97,326	1,55,429	99,483	76,211

N. B. @ 1/3 the area is actually under cotton.
* 1/10 the area is actually under cotton.
II a, c, d, e, f do not contribute to area increase.
Totals give actual areas under cotton.

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TABLE II.

Cotton Extension Scheme — Madras.

(Targets achieved as additional area and production during 1950—'51 and 1951—'52)

Items of Extension	1950—1951		1951—1952	
	Area in acres	Production in bales of lint	Area in acres	Production in bales of lint
I. *By Extensive Cultivation:*				
(a) By reclamation of fallow land	5,103	725	4,270	606
(b) By replacement of food crops	1,630	815	42,818	16,759
(c) By replacement of other crops	2,26,068	35,000	26,946	1,987
(d) Double Cropping	2,000@	500	5,823@	1,414
II. *By Intensive Cultivation:*				
		No Programme		
(a) Irrigation	..	..	..	..
(b) Inter-cropping	78,224*	3,747	1,38,426*	12,681
(c) Manuring (Application of Ammonium Sulphate)	14,250	1,269	13,000	6,256
(d) Improved Seed	1,01,420	5,304	1,63,790	8,107
(e) Control of Pests and Diseases	..	..	176	5
(f) Improved cultivation methods	..	..	2,049	..
Grand Total I plus II	2,42,625	47,360	88,882	47,815

N. B. @ 1/3 the area is actually under cotton.
* 1/10 the area is actually under cotton.
II a, c, d, e, f do not contribute to area increase.
Totals give actual areas under cotton.