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The Cultivation of Rainfed Deshi Cotton on the Black Soil Area of the Central and Southern Districts of Madras State with Suggestions for Improvement

by

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Introduction: Nearly five lakh acres of black soils in the Southern and Central districts of the Madras are annually cropped with rainfed deshi cotton, comprising more than one variety, known in trade as "Uppam", "Tinnies" and "Karungannies" (1). Uppam is short stapled (22/32" and below), low ginning, coarse linted cotton, spinning only upto 14's warp counts and belongs to the species *Gossypium herbaceum race acerifolium*. It is grown in parts of Central districts and coastal taluks of the Southern districts. Karunganni — *Gossypium arboreum race indicum* is a superior medium stapled (26/32" to 27/32"), higher ginning variety, spinning up to 24's and of higher market value than *Uppam* and is grown in parts of Central and Southern districts. Tinnies on the other hand is a variable mixture of the types and their hybrid derivatives and is intermediate in staple (23/32" to 25/32"). From the point of climate and agriculture the unirrigated deshi cotton tract can be classified into two distinct zones, namely the districts of Tirunelveli, Ramanathapuram and part of Madurai forming a Southern zone and distinct from the Central zone comprising the districts of Coimbatore, part of Tiruchirapalli and Palani taluk of Madurai district. Cotton is raised as a rainfed crop and is sown mostly broadcast with the help of North-East Monsoon rains, though the variety grown and rotational practices differ widely. Improved methods like drill sowing and intercultivation with labour saving implements advocated by the department are yet to become popular in these zones. This paper aims to describe the distribution of the several varieties of unirrigated deshi cottons in the black soil area of the "Tinnies" tract comprising the Southern and Central zone, cultivation practices and suggest ways and means for stepping up the production of the quality cottons evolved by improved agronomic practices.

Existing practices: (i) *Southern zone:* The normal area under cotton in this zone is about four lakhs of acres. The tract receives an average annual rainfall of about 25" during the growth phase of the crop. The rainfall and the black soil conditions obtaining on

the Agricultural Research Station, Koilpatti, the northern-most taluq of Tirunelveli district, may be considered to represent the typical conditions obtaining in the zone. On the western side of the tract however, the soil is comparatively richer and is more favourably placed with reference to amount and distribution of rainfall. The black soils in the coastal area abutting on the Gulf of Mannar are deeper and stiffer. They crack more deeply and extensively than the soil in the hinterland. From the topography, it is seen that the general tilt of the land lies towards the gulf in a south easterly direction. Waters from the elevated western ridges drain over this area. Partly due to this and partly due to this being heavy soils, it takes a longer time for the soil to get into condition for sowing. Besides, the North-East Monsoon commences here two to three weeks later than on the western fringe. Cotton sowing therefore begins late, a little in advance of the closing phase of the rainy season. The time of sowing in the southern zone generally depends on the amount and distribution of precipitation of the North-East Monsoon during the prevalence of which nearly half the total annual rainfall may be expected normally. Sowing period extends from September in the west and north west areas of the zone to November in the east and south east. The variety that is cultivated in the western regions is usually *Karunganni*. From long experience the farmer in the eastern areas finds that *Uppam* is able to do better than Karunganni which being earlier runs the risk of exposing its bud and bolls to the untimely rains in February resulting in their shedding. *Uppam* is able to escape this contingency by its late habit and is better adapted than Karunganni to withstand the distress conditions associated with heavy black soils due to its relatively deeper root system. A mixture of these two varieties and their hybrid segregates is also cultivated in certain areas within these two regions. Ramaswamy Mudaliar and Balasubramaiam (5) surmise that *Uppam* is not indigenous and has been introduced more than a hundred years ago.

Preparatory cultivation all over this zone consists of two to four ploughings with the country plough. Cotton is generally sown broadcast. Drill sowing is adopted to a limiled extent by a few enlightened farmers in parts of Kovilpatti Taluq. This is done with a country seed drill (the 'gorru') with three or four tynes and the seed is later covered with th 'guntaka' (blade harrow). A seed rate of fifteen to twenty pounds per acre is used in when boardcasting. The ordinary rotation is 'cumbu' (*Pennisetum typhoides* S. & H.) or 'irungu cholam ;' a variety of cholam (*Sorghum dochna*) sown thick

to provide fodder for work animals, followed by cotton. In a few places cotton is raised year after year without any rotation. In parts of Madurai District cotton is preceded by *samai* (*Panicum millare Lamk*) or *tenai* (*Setaria italica - Beauv*) and followed by cholam. In most of the talqus the major area is under a pure crop of cotton. In the case of mixed cropping, coriander, black gram, grount nut, tenai, and horsegram form the subsidiary crops in the mixtures. These are sown behind the country plough in rows six to eight feet apart. Generally cotton does not receive any manure. The previous cumbu crop in the rotation receives farmyard manure at 20 to 25 cart loads per acre. If the previous crop is *irungu cholam*, it is sheep penned occasionally. One hand weeding is given when the crop is about a month old. By way of after cultivation the field is hand-hoed twice at intervals of 15 to 20 days. Harvest commences in February and is usually over by the end of April. Payment to labourer is usually given in kind. The average yield for this zone varies between 250 and 280 lb. of kapas per acre. If good and timely summer showers are received in April, a second flush is also obtained during which a quantity of kapas ranging between a tenth to a third of season harvest is gathered.

(ii) *Central Zone*: The black soil areas of Coimbatore constitute the major part of the zone. The soil is fairly deep. Stretches of undulating land lie unbunded resulting in soil erosion to a great extent by the monsoon rains and by the strong westerly wind that prevails for nearly four months from June. As a result, the fine particles of soil are carried away by the wind from the fields. Generally, sowings of dry cotton commence with the onset of North-East Monsoon rains received in October and are over within the third week of the month. The average rainfall in this area during the crop period varies from 12″ to 18″, received mostly in the North-East Monsoon season. The variety cultivated is mainly *Karunganni*. In insolated pockets the ryots prefer to grow *Uppam* either in pure form or mixed with *Karunganni*. The major portion of the crop is raised under rainfed conditions though some ryots grow *Karunganni* under irrigation. In such cases two to three irrigations only are given during the driest part of the season,-December and January.

Two to four ploughings by country plough are given by way of preparatory cultivation. Cotton sowing is done by broadcasting the seed, the only method followed in this tract. The seed is covered by working the country plough. The seed rate adopted ranges from 15 to 20 lb. per acre. In all the places the major area is under pure

crop while in a few places coriander, bengalgram and tenai are grown as mixtures. In this tract also the rainfed cotton is not generally manured. 'After cultivation' consists of one hand weeding given when the crop is nearly a month old and one to two hand hoeings given at an interval of 15 to 20 days. Pickings commence in February, and are generally over by the end of May. The average yield for this tract varies from 200 to 250 lb. of seed cotton per acre.

Improved strains under distribution and further trials: Depending upon the suitability of the tract two strains, viz, K. 2 and K. 5 obtained from inter-arboreum crosses and evolved at the Agricultural Research Station, Kovilpatti and the Cotton Breeding Station, Coimbatore respectively, are now in general cultivation in the Southern and Central districts of the State respectively. It was found desirable to grow one cosmopolitan strain of arboreum cotton for the entire area to maintain purity and prevent the malpractice of mixing. The objectives set forth for the evolution of such a cosmopolitan strain were that it should be able to (1) withstand the ill effects of untimely rains of February – March in the south (2) possess a ginning outturn of 34% or more, (3) have a staple length of over 15/16" (4) spin 40's standared warp counts and (5) give an average lint yield of about 150 lb. per acre as detailed by Kalyanaraman and Radhakrishnan (2) To achieve these objects work is progressing at the Agricultural Research Station, Kovilpatti. It was found that four long linted cultures, namely 6186–9, 6188–8,, and 6312–A gave consistant and encouraging results in the trials conducted at the breeding stations in Kovilpatti and Coimbatore. These were tested for the first time during 1952 – 53 on representative cotton areas in the central and southern districts to ascertain their adaptability levels. Results from these trials for three consequtive seasons indicated that all the cultures were found to be as adaptable as the local. Besides, the ginning percentage and halo-length of these long linted types were significantly higher than those of the locals (3). Of these, culture 6186–9 was finally found to be the best cosmopolitan strain to replace the existing strains of K. 2 and K. 5.

Further scope for improvement in cotton cultivation: A review of the cultivation practices followed in these tracts reveals that there is great scope for improving the yields of the crop, besides the use of seeds of improved strains. Improvement in the method of sowing; nature of preparatory cultivation, manuring practices, after cultivation practices are important considerations. The improved practices of working 'guntaka' for levelling lands after ploughing and

covering the furrows after sowing, using seed drill (Gorru) for sowing and using 'danthi' for intercultivation are not in vogue anywhere in the Stote. In these years of successive droughts and abnormal weather conditions the practices adopted by the dry land cotton farmers of the tract would seem to be far behind the requirements of the times and needs. Neither climatic nor local conditions could be impediments in the way of the cultivators for the adoption of improved practices for improving the crop. Their use is economical, efficient and simple. The following methods are recommended to improve the yield of the unirrigated cotton crop.

(1) Bringing the field under plough soon after the harvest of the previous crop, and breaking clods by the use of 'guntaka' to settle the soil and conserve much of the rain water.

(2) Putting temporary bunds across the slope and along contour for checking soil erosion, conserving the rain water and prevent 'runoff'.

(3) Working 'guntaka' prior to sowing to form a good seed bed and securing a good initital stand of the crop.

(4) Using chemical nitrogenous manure like ammonium sulphate at the rate of 100 lb per acre to supply 20 lb of nitrogen just prior to sowing. An increase of 37% has been obtained at the Agricultural Research Station, Kovilpatti by applyin8 40 lb of Nitrogen per acre in the form of ammonium sulphate.

(5) By the adoption of drill sowing with the help of '*gorru*' which enables the use of '*danthi*' for intercultivation when the crop is in the land.

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