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The Future for Oil Seeds Research in Madras State

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Research on Oil Seeds is a recent development in the department of Agriculture of Madras State, and has been in progress only for the last twenty-five years, but the results achieved in breeding, agronomy, plant protection and other aspects of their cultivation are quite substantial. Intensive selection and hybridisation work in groundnut, gingelly and castor has resulted in the evolution of a number of strains with high yields, high oil-content and other desirable agricultural and commercial qualities. Amongst these, four strains in groundnut, three in gingelly and four in castor, have established their superiority over the local cultivated varieties. In coconut, which is a perennial plant with a high percentage of cross pollination, selection based on the characters of mother palms, seed-nuts and seedling progenies is being carried out in the promising ecological types. Hybrid vigour as a means of improvement has also been utilized in coconut by crossing the 'tall' and the 'dwarf' types to produce progenies possessing the desirable features of either of the parents like earliness, yield, etc. On the agronomic side, a few problems connected with these crops have been investigated. In groundnut the optimum economic spacing, manurial requirements, the best crop rotation, and remunerative mixed croping practices have been determined. For castor and gingelly, the optimum spacings have been fixed. In the case of the coconut, proper cultivation and manuring practices and efficient green manure and subsidiary crops have been fixed. From the investigations carried out on pests and diseases of the groundnut crop, effective control measures for the *'Surulpoochi'* pest and *'T'ikka'* leaf spot disease have been found out. The correct stage of harvest that would ensure maximum yield and good quality produce have also been determined for these crops. The problem of storage of groundnut pods and kernels has been investigated and results of value to agriculturists and trade have been obtained. In spite of the fact that substantial progress has been recorded in the improvement of these crops, a large number of other problems connected with their cultivation still remain to be investigated. Only when proper solutions to these problems are found out, can it be claimed that oil-seeds cultivation and the industries utilising oil-seeds as a raw material have been established on firm foundations. Suggestions regarding the lines on which the future oil-seeds research in this State should be pursued to attain the above objectives are set forth in the following sections :

Groundnut: Though the improved strains now under distribution are heavy yielders with good quality produce, still they cannot be

claimed to meet all the varied requirements of the growers, consumers and industries. As far as the growers are concerned, there is an urgent need to evolve types resistant to drought, pests and diseases, amenable to mechanical cultivation and with short period of seed dormancy. With the increasing edible uses to which groundnut is put to, there is demand for a type with low oil content and high sugar content. In the *Vanaspathi* industry, the need for a type capable of giving colourless oil is keenly felt. For these reasons, breeding of new forms with special attributes like semi-spreading habit of growth, medium seed dormancy, low oil and high sugar content, white seed, etc., has become imperative. With these objectives in view, an intensive breeding scheme on this crop has just been initiated in this State with financial assistance of the Indian Central Oilseeds Committee. The nutritional aspect of the groundnut crop is rather a complex problem requiring thorough investigation. Though the normal nutrient requirements of the crop have been determined, still the economic doses of the nutrient elements and the changes brought about by them and other micronutrients under varied conditions of soil, need very careful study. A physiology scheme for carrying out comprehensive investigations on this aspect has also been started recently under the auspices of the same Committee. With the decline in prices of groundnut in recent years and growing foreign competition in the international markets, it has become increasingly necessary to reduce the cost of production of the groundnut crop to the maximum extent possible. Sowing and harvest account for a very large share of this cost. Use of labour-saving implements for these operations, including intercultivation, can be expected to reduce the cost of production considerably. Trials with bullock and tractor-drawn implements for carrying out the above operations have been taken up under a third scheme sponsored by the Oilseeds Committee. Work in respect of control of major pests and diseases affecting this crop and evolving strains resistant to them have to be carried out by adopting the latest breeding techniques.

Gingelly: The three strains now under distribution no doubt meet the requirements of the growers of the State for raising the crop in different seasons and under varying conditions of cultivation, but there is a great need to evolve cosmopolitan types that would come up well in all seasons and in all tracts. There is also a need to step up the present yield level of the crop by bringing together all the economic features now found scattered in different forms. A programme of cyclic crosses between selected economic forms has been started for this purpose and the work will have to be pursued rather intensively for achieving the desired results. The specific nutrient requirements and their optimum doses have still to be determined for this crop. Manurial trials aimed at securing this information have been initiated. Among the pests and diseases affecting this crop, the shoot-webber pest and the "phyllody" disease are the most serious and studies have to be pursued on their control both by chemical treatments and by breeding resistant varieties.

Castor: The strains of castor under distribution are outstanding in their yield performance. But on account of their long duration, they have not become as popular as they should be. The prospect of reducing their duration without sacrificing yield appears bright, as types with very short duration are found among the new introductions. To keep up the purity of improved strains under cultivators' conditions there is a need to impart some distinquishing feature to the standard strains so that the off-types could be easily recognised and removed. As hybrids between certain inbred types exhibit a high degree of vigour, with consequent increase in yield, exploitation of this vigour for production of hybrid seeds is a line of improvement worth pursuing. Work in this regard has been commenced and crosses between certain predominantly pistillate and staminate inbred forms have been attempted for fixing up the most suitable combination. As in gingelly, work has to be carried out on determining the nutritional requirements of the crop and an efficient rotation. The 'Semi-looper' caterpillar is the most dangerous pest, doing considerable damage to this crop. Any control measure against this pest will be a source of great relief to the growers.

Coconut: In recent years large-scale production of selected seedlings of the ordinary tall variety and of the Tall × Dwarf hybrids has been started. Exploitation of other promising exotic varieties like Cochin - China, Andaman Ordinary, Java, Philippines, etc., and other fruitful combinations of T × D hybrids form the main programme of breeding in coconut. Determining the optimum and the economic doses of the manures to be applied to the palm at various stages of its growth is another important aspect requiring investigation. Bringing the vast stretches of unproductive gardens along the sandy coastal belt to a state of normal bearing by providing adequate manuring and summer irrigation (with the aid of filter-points) is yet another line which has great potentialities. This item of work is proposed to be taken up immediately at one of the Coconut Stations. As the results obtained from the trials on the West Coast Stations are not applicable in their entirety to the conditions on the East Coast, there is a real need to establish a regional research station for coconut on the East Coast also. Button-shedding, occurrence of barren nuts and effective control of the rhinoceros beetle are some of the other serious problems facing the coconut grower, on which systematic investigations are urgently needed.

The above review outlines the major problems connected with oil-seed crops that still await solution and the steps that should be taken to tackle them. Already there are signs of success in many directions. If these problems are pursued with zeal, it will not be long before the cultivation of oil-seeds in this State and the industries depending on them get well established, and open up new vista of prosperity for the Madras State as a whole.