

manifold amenities of the modern age. Contributions from the countryside are of equal importance. It alone can produce the raw materials of commerce and industry and thus help in the growth of towns and cities. It alone can supply adequate and wholesome food to the millions of our land whether resident in the village or town. Lastly, the countryside alone can imbue the urban 'business' civilization with the deeper character and larger humanities which are nurtured in the villager through his more direct and constant contact with the great forces of Nature and of life. Our duty then is clear: namely, to improve the *Village*, the nucleus of our country life and infect its Chief Agent, the *Villager*, with a chosen culture of the virus of modern age through *Education* and *Industrialization*.

## Agricultural Fottings

BY THE DEPARTMENT OF AGRICULTURE, MADRAS

**A Superior Groundnut Variety.** Improved crops mean more money for the ryots.

The Government Agricultural Research Station at Tindivanam, South Arcot District, is almost entirely devoted to the improvement of oil seed crops, on which intensive breeding and selection work has been carried on during the last six years.

The most important among the oil seed crops of the Madras Presidency is the groundnut with an annual acreage of about two and a half millions or roughly about 50% of the area in the whole of India, and the produce of Madras alone is worth about 150 million rupees. With a view to obtain the most profitable varieties for South India nearly a hundred varieties from the various groundnut growing regions of the world have been carefully tested at the Agricultural Research Station, Tindivanam during the last six years.

Saloom or A. H. 25, a selection from one of the African varieties, has proved to be superior to all the other spreading or the runner varieties, under South Indian conditions. The duration is nearly 135 days; the increase in yield over the local variety commonly grown has been as high as 20% to 30% in parts of Nellore, Guntur, North Arcot, South Arcot, Salem, Trichinopoly and Madura Districts. Besides being a high yielder, the variety is superior to others in that it is more drought resistant and is, therefore, well suited to be grown under rainfed conditions, particularly in areas of low rainfall. The smooth and cylindrical nature of the pods facilitates easy harvest of plants with most of the pods in tact. It has another desirable quality, namely bold kernels, which is valued in the market. This new variety is not intended for the irrigated season for which the local variety is preferable.

Though the variety was first made available to the ryots only three years ago, it has found favour with the groundnut growers of the Presidency and the demand for the supply of seed has considerably increased. The reason why the area under the improved variety is not more than what it is at present, is due to the fact that sufficient supply of seed is not available, on account of low multiplication of seed: unlike small grained crops, in groundnut, the yield is only about twelve times as much as the seed rate. As it is not possible to supply all the seed that is in demand for sowing, groundnut growers who have been raising the improved variety will do well to utilise all the produce entirely for sowing purposes.

It may be added that the correct seed rate for the rainfed crop on red soils is about 60 lb. of kernels per acre.



**Maize as fodder.** It is well known that cattle would relish some sort of green fodder at any time during the year particularly so in summer. Every good farmer is, therefore, bound to provide his working animals with at least small quantities of succulent food. The material chosen must be capable of being grown throughout the year and give a good return within the shortest period possible. Maize satisfies these conditions. Trials made at the Agricultural Research Station, Koilpatti showed that it is ready for harvest within 45 days and yields over 30,000 lbs. of green stuff per acre. This quantity can be obtained from periamanjol cholam but it takes double the time as it cannot be cut before it is in flower.

Maize is best grown on red soils where facilities for irrigation exist. When sown at the outbreak of the north east monsoon rains a very good crop can be raised without irrigation. At Koilpatti, the crop was sown over an area of 50 cents at the end of September with the help of a rain and it was ready for harvest on the 40th day. The cost of cultivation was Rs. 18 and the value of the produce was Rs. 50 giving a net return of Rs. 32 on 50 cents. The green fodder was valued at 300 lbs. per rupee.

Any farmer having lands in the vicinity of a town can easily make this a business concern. He can readily sell his fodder in small bundles and also make money in selling green cobs. A small area can be left for seed purposes so that he can have his own seed next year. The experience at Koilpatti proves beyond doubt that the possibilities as indicated above are great.

**Poudrette as a manure for Paddy, Flowers and Fruits.** For a little over a decade, as a means of sanitary disposal, the Calicut Municipality has been collecting its night soil and transporting it to the trenching ground at Chervannur and covering it with earth. The site is a thinly populated suburb of the town and outside the Municipality. The daily output is 30 tons, lorries of  $2\frac{1}{2}$  tons load making 12 trips in all; this would manure annually a little over 2,000 acres of paddy. The locality has a vast paddy area, deficient in natural as well as added fertility, and 65% of it is single crop land where cultivation is carried on in the most perfunctory manner. All that is done by way of manuring is to sprinkle a little factory ash at sowing time.

Realising the high crop production value of human waste and the scope for work in this direction in the vicinity of the trenching ground, the Agricultural Department set to itself the task of utilising night soil as a manure which in the course of about a year was found absolutely free from noxious odour and fit for handling just as other manures. Trial plots were started 3 years ago. As local coolies refused to handle the manure more due to prejudice than ignorance, scavengers from Calicut had to be taken who were paid at 12 annas a cart-load for carting and spreading. It was a surprise to the ryots to see the Agricultural Demonstrator supervise the work at the trenching ground and in the field. Ryots were loud in their objections; some of them were that the manure was responsible for rank weed growth, for more straw than grain and for bad flavour and low keeping quality of cooked rice. With great difficulty and persuasion the first trial was conducted in 1934 and the result, though to a small extent vitiated by want of timely rains, was in favour of poudrette plots that gave a 10% higher yield in grain and 25% in straw than the controls.

In 1935-36 three trial plots were laid out sufficiently early and poudrette worked in the hot weather by constant ploughing to reduce the weeds. The difference in the subsequent crop was striking with an average net profit of Rs. 4 per acre over the control which convinced the ryot of the intrinsic merit of poudrette as a manure for paddy. For the second crop of the same year the



Department helped only with a half grant the other half being met by the ryots themselves. In spite of an indifferent season, a 20% heavier yield was obtained. This result has really impressed the ryots, and encouraged them to come forward early in 1936 for permission from the Municipality for 25 cartloads of poudrette which they carted and spread at their own expense. The ryot has thus been brought round to appreciate the advantage of poudrette as a manure and when price of paddy and financial depression improve it is likely that he would use it on a larger scale.

Similar trials were conducted in and around Mangalore with success. The Cattle Improvement Society, South Kanara, Mangalore, has used poudrette for manuring fodder grasses and the crop has responded very well to the treatment. Mr. K. T. Alwa, the well-known horticulturist of Mangalore, who carries away most of the prizes in the Fruit and Flower shows at Mangalore, writes as follows:—"I have been using this manure for the last four years with very good results both for my flower and fruit plants. I have tried all sorts of manures but there is nothing to beat this. Even for paddy, it is very good. Mr. K. Thimmappa Hegde has been using this extensively for his paddy cultivation." This valuable manure is still wasted in many places on account of the prejudice of the ryots to handle it, but the department is trying to overcome the prejudice by actual demonstration and it is only a matter of time for this organic waste to be utilised extensively for economic crop production.

**Composting farm wastes.** One of the factors for increasing the crop production is the manure supply. As the population increases, intensive cultivation has to be practised on the limited area available to meet the demand for the food products and the other necessities of agricultural produce. Cattle manure obtained from the cattle sheds is not enough to manure all the dry and garden lands adequately and the use of artificials alone is not desirable especially in dry lands. In all villages organic wastes are available. It is a common sight in South Arcot to see the cane trash in fields being set fire to, after the canes are harvested. Burning this waste produce is considered to be an economy as it saves the labour of removing the trash from the field. This is false economy. At Palur Agricultural Research Station cane trash is being converted into compost for the last few years.

The process consisted in putting small quantities of trash under the feet of cattle daily. The floor of the cattle-shed was at least one foot below ground with a hard bottom. Trash and other farm wastes were spread daily in the pit to serve as bedding for the cattle as well as to conserve the urine. The dung was spread evenly in the morning and another layer of farm waste was put over it. This was continued for about a fortnight. At the end of the period the stuff from the cattle shed was removed and heaped in a convenient waste land to make a long heap about ten feet in breadth and three feet in height. The heap was turned three times with an interval of about a month (preferably after heavy showers). The heap was moistened sufficiently to hasten decomposition. Cane trash treated in this way was ready for use in four months. Thus the manurial requirements of the dry lands can be amply met. The labour required for heaping, turning and moistening comes to Rs. 0-12-0 per ton of compost manure. This manure when analysed was found to contain a little more than half the quantity of nitrogen contained in the farm yard manure and compares very favourably with the cattle manure available in the villages.

As some organic bulky manures are necessary to maintain the physical condition of the soil the cane cultivators who do not require trash for any other purpose can convert it into compost and use it in their fields to supplement other manures and thus reap good crops at a small cost.



**Selections of Seednuts and Seedlings in the Coconut.** Good seed ensures good crops. In a crop like the coconut which may last as long as eighty years, and in which the bearing capacity can be properly judged only about twenty years after planting, the selection of proper seed is obviously of utmost importance. The mistake made in selection cannot be rectified later and the care and attention bestowed on gardens from poor seed would not be sufficiently recompensing.

There are two main types of coconut palms—the tall and the dwarf. The dwarf type, occasionally found in back-yards of houses, though a very early yielder, is not suited for economic planting on a large scale. It is only the tall type which is extensively cultivated for commercial purposes all over the Presidency.

Seednuts are best obtained from recognised seed centres with a reputation for quality. Nuts should be selected from high yielders, yielding about 100 nuts per tree per annum. Such trees can be recognised by a large number of leaves in the crown, by the lower leaves drooping down like the ribs of an opened umbrella and by their tall trunks. Trees with short and strong leaf-bases should be selected. Poor yielders, i. e. those yielding about 30 nuts per tree, per annum, as also irregular bearers are undesirable as seed material. Very young or very old trees are usually rejected for seed purposes.

The next consideration is the sort of nuts that should be selected. They should not be too big or too small—should be of medium size, round in shape with thin husk. Fully mature nuts harvested in the months of February to June are the best. Usually one or two nuts at the top and the bottom of the bunch are discarded. The nuts thus selected are dried in the sun for four or five days.

The selection should not stop with the nuts alone and should be continued in the nursery also. Intensive research on coconut seedlings carried on during the last several years at the Government Agricultural Research Stations on the West Coast, has shown that the following are the characters of good seedlings, i. e. seedlings which will grow into high yielders.

1. Early germination,
2. Large number of leaves in the seedling,
3. Height of seedling, and
4. Good girth of the stem of the seedling.

Such seedlings are mostly obtained from round medium-shaped nuts mentioned above.

It is always desirable to sow in the nursery about 40% more seed nuts than the number of seedlings required so as to have sufficient scope for selection, with a view to reject unhealthy and poor seedlings.

The Department of Agriculture is always ready to offer advice and possible help on this important subject of seed selection.

**Time of application of Ammonium Sulphate for Paddy.** Recent researches all over the world have brought out the value of artificial manures or 'fertilisers' as useful adjuncts to all bulky or organic manures. If the economics of the various systems of manuring are worked out, it is found that the application of a judicious mixture of artificials and organic manures yields the greatest margin of profit. Though the amount of fertiliser applied is very small, it gives a great fillip to the final yield, thus justifying the extra cost incurred. It must, however, be borne in mind that to obtain the best results, the optimum amount of fertiliser should be applied at the right stage of crop-growth.

In the case of the paddy crop, research work at the agricultural stations of the province has shown that a top dressing of ammonium sulphate over the usual



basal manuring of green leaf gives greatly increased yields. Though the usual agronomic practice in this province is to apply the manure at planting time, experiments conducted by the Agricultural Department show that the best results are obtained when the Sulphate is applied 4 to 8 weeks after transplanting, depending upon the variety of paddy, the nature of the tract and the fertility of the soil.

The experimental results show that significant yields are obtained when the manure is applied one month after planting at Pattambi (South Malabar), six weeks after planting at Coimbatore and two months after planting at Aduturai (Tanjore) and Maruteru (West Godavari). Developmental studies on the paddy plant have shown that this critical period when the manure has to be applied synchronises with the formation of the ear-head, which is approximately a month before flowering.

In general, for lands of average fertility receiving a basal dressing of green manure, an application of the usual dosage of ammonium sulphate, a month before flowering is highly beneficial. Its application at planting time can be of advantage in promoting initial tillering where fertility is low.

**Sorghum for Popping.** Sorghum, *cholam* (Tam.) or *jonna* (Tel.), is one of the staple food grains of the poor and backward classes in the presidency. One of the ways in which sorghum grain can be used as food or delicacy both by the poor and by the rich is by converting it into pops (பொப் Tam.) or puffed grains.

Among varieties of cholam grown in South India the group which is commonly known in the Tamil districts as *Talai virichan cholam* and in the Telugu districts as *Konda jonna* or *Muthyala jonna* is the most suited for making pops. These sorghum varieties have grains which are small in size, with horny (not powdery) contents. These seeds have also thick seed coats. Sorghum varieties not having these characters do not pop well.

Popping is done by putting small quantities of grain on a hot pan kept over a steady fire. For popping large quantities, mud pots are generally used, while for small quantities small iron pans are found to be suitable. To get uniformly good pops, the grains should be only one layer thick at the bottom of the pan. To ensure the proper heating of all the grains they should be briskly stirred. A small brush made out of the midribs of the coconut leaf serves this purpose well.

As the grain gets heated by contact with the hot pan it swells and a longitudinal crack is developed on the bulging grain. This crack widens, and irregular cracks are formed cross-wise. The slight moisture in the grain is rapidly converted into steam by the heat applied. The thick seed coat offers resistance to the steam which tries to escape, with the result that there is an explosion and consequent ejection of the endosperm. The grain is thus converted into a chalky white puff which is usually hemispherical in shape with bits of the everted seed coat sticking to its bottom. A good pop looks like a tiny cauliflower in general appearance.

The popping of sorghum as a cottage industry exists in isolated places in this presidency. Pops are made into balls mixed with jaggery and are sold especially during fairs and festivals. They have a fine flavour and are easily digested. When the suitable type of grain is not available locally, the grain is imported from the Coimbatore and Cocanada areas of the presidency. There are reports of importations from Burma also.

In sorghum pops, the poor and the rich have a cheap and wholesome luxury and popping as a cottage industry deserves greater popularity.