

*** Paddy Cultivation in the Madras Presidency and the lines on which it can be improved, with special reference to the Tanjore District.**

The lines of improvement of paddy in the Tanjore District may, for the sake of convenience, be classed under the following heads.

1. Improvement in the present systems of farming.
2. Improving the methods of cultivation.
3. Improving the supply and use of manure.
4. Consolidation of the holdings.
5. Extending roads to wet lands.
6. Improvement in the irrigation of paddy lands.
7. Introduction or extension of commercial crops in rotation with paddy.
8. Using machine power for farm operations wherever possible.
9. Seed selection and improvement of crop by means of seed farms and demonstration farms.
10. Education of ryots about the insect pests and diseases and the simple forms of combating them.
11. Introduction of such recognized improvements in estates under the Court of Wards.
12. Co-operation and formation of co-operative agricultural societies.

Systems of farming:—In this district the systems of farming are three in number, viz., Varam share system, lease system, and pannai or home farm system.

Varam system is the most extensive, being practised by most of the big landholders who own a great portion of the district and also by men who go out of the village to eke out a living in the nearest town. In this system the tenant does the whole cultivation, and takes a share of the produce. This is quite an easy going method for the land holder, for, whatever the produce may be, he gets his share of $\frac{1}{3}$ to $\frac{2}{3}$ according to the fertility. Big estates are managed with a few, low paid agents only in this way. It is such lands that are under the poorest conditions. The tenant who can only cultivate 2 acres under pannai system, cultivates more than 3 acres in Varam system and thus what he loses in the yield per acre, he gains by the increased extent cultivated with the same exertion and capacity.

* Being extracts from the Essay written by Mr. K. Raghavachari, L. Ag., Assistant Farm Manager, for the Munagala Prize, adjudged second.

Lease system:—This method, in which fixed money or grain rent is paid to the landlord by the tenant, is very good, but the temporary nature of the leases, makes the matter bad and the lands are never improved.

Pannai system:—This is the least practised in this district. By this system the landlord cultivates the land himself, keeping cattle and engaging permanent labourers, known as Pannaials or serfs. This system is generally the best and such lands are in a highly cultivated condition. The Pannaials are low paid, but get liberal presents and loans. Now-a-days, these coolies desert the lands and go away to foreign places where they get better wages: and the question now is whether the landlord can afford to pay such increase of wages as would stop emigration of coolies. The short period of work during planting and harvesting and the absence of work during the interval, make it difficult to pay the coolies a higher rate of wages all through the year. If he can make arrangements to engage the labourer during the off-season on some remunerative work, the question of increased wages is easily solved. That is to say, he must raise such other crops, along with or in rotation with paddy, such as sugarcane, plantains, and others, that would engage labour during other seasons also. Starting cottage industries, such as rearing Eri worms, extraction of plantain fibre and making ropes are other directions in which the coolies may be engaged.

Of these three systems the pannai system is in every way the best and the varam system the worst. Wherever it is not possible to manage the lands under Pannai system, as in the case of big Mirasdars, the best thing would be to let the lands on long leases of not less than 10 years' running. It is only then that the lessee will have some interest in improving the land, by manuring, levelling etc. and it is not too much if a law is made that the lessor should meet a portion of all permanent improvements effected. Allowing a percentage of the profits to the land agents would create more interest in them in improving the cultivation.

On account of the scarcity of labour the planting is prolonged so long, that the last planted seedlings get destroyed by the heavy rains that follow, and the crop invariably suffers for want of water at the latter stage. A man and a woman and one pair of cattle for 6.67 acres is the rule in this district. The man does ploughing and supplies the seedlings, while the woman has to do only planting work. It takes about $2\frac{1}{2}$ months for completing the planting of a man's holding. The season for planting is not so long and as such it is missed in most cases during the latter plantings. Why not then sow a portion of the area broadcast? The less yield obtained by this method would be more than made up by the late planting and its failures. Broadcasting is cheaper. More than an acre can well be sown by one man while 12 to 15 women and more than 5 men are necessary for pulling seedlings, transporting and planting the same area. If the extra saving effected by this method be used for manuring, it is quite possible to get better yields than by transplanting.

The system of planting singles is generally coming into vogue. At any rate the ryots use far less number of seedlings in each hole now than they were using before.

Paddy is harvested when the ears are completely ripe. The harvested produce is bundled, carried to the thrashing floor and thrashed on the same day. Thus harvesting is prolonged for want of sufficient labour. The system which is adopted in Nellore of harvesting the crop and stacking the sheaves in the fields themselves and thrashing leisurely would save nearly $\frac{1}{3}$ of the labour, and even more if women are engaged; thus the area may be finished in a shorter time with the available labour. The sheaves may be thrashed leisurely in summer after all the farm work is completed.

Manure:—The small amount of cattle manure is only sufficient for the nurseries, dry lands, if any, and for kuruvai crop. The growing of green leaves on the fields has succeeded in several parts of the district, and there is some difficulty in places where the soil is very stiff, as it cracks much and exposes the roots of plants which wither soon. Growing field gram is a common practice throughout the

district in all soils. Daincha is a quick grower and, if sown under similar conditions and with a thick seed rate, would grow to a height of more than 2 feet before the soil cracks badly and this may be cut, dried and preserved for trampling later on. Green manure cannot be grown in this district, as in others, by irrigating the land, as the land is spoiled and the paddy crop fails. Cattle trespass is one of the causes which prevent people from growing green manure crops on their lands. This is due to want of union among the villagers who can easily join together and sow a green manure crop in one portion of the village where cattle trespass must be absolutely prohibited, while the rest of the village may be used for the grazing of cattle.

The next point is the utilisation of all the waste lands, such as the bunds of rivers, channels and fields and any other place, where no crop is growing. Every weed should be collected, whenever there is no work for the coolies, stored in pits and allowed to rot. This will provide an excellent manure and would go a great way. The dry leaves of trees and topes should also be similarly utilised.

The soil survey of the Tanjore District shows an extreme poverty of phosphatic ingredient in the soil and this has to be replenished. Fish manure is found to give very good results as well as superphosphate, though the relative values of each have not yet been found out for this district. Other phosphatic manures, such as bone-meal and mineral phosphate, though slowly available, would add much to the fertility of the soil. The value of bone as manure is very little known to the ryots. It is even profitable to crush the bone, rot it with lime and urine along with yard manure and apply to the soil.

There is the question of individual manuring. The coolies have not much work after planting. Why not engage them in applying a handful of well-rotten manure, cake, fish-manure or others to each plant after the crop is established? This would certainly pay; for this, the seedlings may be planted for convenience in rows and even further apart than usual. In the case of Ottadam, a 2nd doze of cake or other manure would greatly increase the yield; at least it is worth a trial.

Big bunds between the fields is a characteristic of this district. Black and red gram are grown along the bunds which give some yield. The sowing of a thick line of daincha all round the bunds would give some leaf. It would also form a very thick fence which would prevent cattle trespass and would even provide sufficient fuel subsequently.

Another feature of this district is that a big land-holder owning hundreds of acres as well as the poor ryot owning a few acres have got their wet lands scattered in several places, a cent here, 10 cents there, an acre in a third place and so on. A lack of foresight in the subdivision of lands by the members of a family is the cause of all this. A system of parivarthanai, or mutual exchange, is going on but not to the desired extent. It is not impossible in the case of interested ryots to elect a panchayat of honest villagers to take the yields of lands to be exchanged for several years, and arrive at certain data to bring about the exchange. There are great possibilities of improvement by consolidating the holdings. Very little land is wasted, labour is concentrated and better supervised. It will also help in enclosing the holdings by strong fences which would prevent indiscriminate grazing and breeding of all cattle.

The importance of roads to wet lands cannot be overestimated. Generally the field bunds are very big, 4 or 5 of which would together form a good cartroad. Such roads to wet lands would be an invaluable improvement. Space is not lost, as both sides can be planted with timber trees or cocoanuts which would give a very good return. All the produce can be very quickly transported cheaply and the ryot need not wait for the fields to dry to cut across them for removing the produce for sale or for storage. The transport of manure for 2nd crop, carting seedlings, grain and straw, and, in short, all agricultural necessities to and from the farm house will be effected very quickly, easily and at a less cost.

The wet lands of this district depend entirely upon the floods of the Cauvery for irrigation. Any sudden stoppage in a flow, such as frequently occur, leaves the ryot in a most helpless condition, though

there is enough water available at a short depth of 5 to 10 feet below ground level. A good well would not cost more than 100 Rupees, while in many cases it can be had for half to $\frac{3}{4}$ of the sum. A well like this fitted with a mhote would be of great help in cases where one or two irrigations would save a crop. Improvement in well sinking would also bring about the introduction of sugar cane in wet lands in rotation with paddy. In some parts reed cane is grown without the aid of wells. But it is not so very profitable. The introduction of better varieties of cane, like the Mauritius variety, would bring better profits. A great extent of lands are not, under the present conditions of irrigation, free from heavy floods, at one part of the season or other, due to uncontrollable floods in the rivers. And if the Government's intentions about the Bhavani Reservoir are given effect to, there will be seen a variety of crops and even paddy grown in almost all seasons. The wells would help in raising an early nursery.

The scarcity of labour during the busy seasons makes the ryot eager to use some other power for finishing the work. A harvesting machine for paddy is necessary. Calculating roughly, it takes from 70 to 90 men to harvest, bundle and thrash one veli of land of which the usual available labour is a man and his wife, the latter of which rarely takes part in the work except for cleaning the grains and sweeping the thrashing floor. For a well-to-do Mirasdar, it takes more than $2\frac{1}{2}$ months to finish his harvest which, if plenty of labour is available, will be finished in 30 days. Although several varieties of different age are planted in different seasons, they all come to maturity nearly together within a period of 15 to 20 days. The most important thing is to get the crop off the ground in season which takes more than half the labour. Machine power to do the cutting may be used and the men and women will be engaged in bundling and thrashing. A good machine with trained coolies and 2 pairs of cattle would be able to cut at least 5 acres a day. The Narbada Reaper of the Manganallur Farm whose work was very eagerly watched by people near and afar, costs only Rs. 250. 2 pairs of cattle and 2 men, with 4 women to collect the sheaves and cut the outskirts, will finish the area which would otherwise require more than 30 men. No need to charge for the animals

which would otherwise be idly fed. But there are certain drawbacks to be overcome which would be done easily if the expert mechanic visits the spot and sees to the working of the machine. That is, the machine must be able to handle a crop that is badly lodged, as paddy very often does when it ripens. I am sure it is no great thing for engineers who have discovered machines to navigate air to solve this small problem. Any mechanism attached to the machine which would raise the crop and offer it to the cutting apparatus would solve the trouble. The use of roads to wet lands has already been dealt with as also the importance of keeping good pairs of cattle which would do all sorts of farm work. People have also got to understand something of mechanism to repair or adjust the parts, which is not a very great thing. There have sprung up, in all towns and in important villages, intelligent artisans who would execute repairs very satisfactorily.

The addition of a thrashing machine to thrash the produce and a winnowing machine to clean the grains and even a grading machine are improvements which would be taken up by people gradually and at no distant date. The springing up of mills everywhere in the district has created some demand for a cleaner stuff, and the more uniform the size of the grains, the less is the waste in hulling by machine power. This can be done at no great cost by the grading machine.

The value of pure and good seed is recognized by ryots, but much trouble is not taken to have a rigid selection of seed for the next season. The ryots are too idle to improve upon their present system of selection. But it is not impossible, by means of co-operation of the villagers, to have pure and good seed supplied to every one from the best crop of the village. The work of rigid plant selection and improvement of strains is the work of the department which must be extended by demonstration and special seed farms on lines similar to those adopted for cotton improvement in the Tinnevely district. The introduction of new varieties which promise better yields must also be taken on hand. But there are already a host of varieties in this

district which could well be improved before introducing others from outside.

The causes of insect pests, the methods of their spread and simple remedies for them are things of which the ryots have no idea and their education upon these elementary principles would be of much use in modifying the evils, such as by the co-operation of the villagers in using bags for grass hoppers and bugs and also in the use of light traps for stemborers and other similar remedies.

The trial and introduction of improvements in Government farms is the first step. These and other improvements of recognized merits must be carried out in the estates under the Court of Wards, which would form centres from which they would extend in all directions. For efficient work and real improvement, it is highly beneficial to have the staff of such estates manned by men with good agricultural experience and knowledge of scientific agriculture.

The importance of co-operation among the villagers and the vast scope for improvement by the starting of co-operative agricultural societies in every village can never be overestimated. Rapid progress is being made with the efforts of the co-operative department. Still their energies are directed to banking and credit side and once people have understood the importance of this movement and have also learnt the advantages of prompt repayment and business methods, co-operation in agriculture is an easy step. Co-operation will facilitate the rapid extension of the many possible improvements suggested above.

*** The Madras Agricultural Students' Union.**

The report read by the Secretary covers the ground of the working of the Union during the last year. I thought it necessary to bring into prominence the principles on which the Union was brought into

* Being summary of paper read by Mr. M. R. Ramaswami Sivan, B. A., Dip. Agri., at the last Agricultural Conference held in July 1914.