

ago. A Central Farm was also opened. A number of experiments was done and the results were published from time to time. Owing to some change of policy the central farm was abolished and Taluk experimental and demonstration farms were opened a year ago.

A scheme for re-organising the Department is under the consideration of the Durbar.

An Agricultural and Industrial Exhibition is being held every year and every endeavour is being made to make the Exhibition as popular and as useful as possible. With a view to encourage improved methods of Agriculture, a few farm prizes have now been offered. The results of the competition will be announced at the time of the forthcoming Exhibition i.e., in next December.

Certain phases of the deltaic agriculture under the Krishna Irrigation System.*

The Krishna Irrigation System extends from Ellore in the north right down to Chinna Ganjam in the south, and from Bezwada to almost within five miles of the sea. Roughly speaking the system commands an area of about one million acres in this tract. The agriculture of this vast area comprises almost exclusively the cultivation of rice. An outline therefore of the main features of this cultivation of paddy in the delta is the purpose of this paper.

Before the introduction of the irrigation system in the early sixties of the last century the whole delta was one open flat dry country of black alluvium or regar loam and was cropped with all the dry crops such as we now see ordinarily raised in black soil tracts. There were of course here and there patches of wet cultivation under tanks which were either rain-fed, or received their supplies from the flood channels diverted from the Krishna. These lands are still known as "mamool" wet though included in the canal system.

*Extracts from paper read by Mr. T. V. Rajagopalachari Dip : Agri. : on 12th July 1915 before the College day and Conference.

At first it appeared difficult to get the people to resort to wet cultivation. There was a deal of misgiving about the success or utility of a wet crop in this tract and this is only natural with a people wedded for ages to dry cultivation. Stories are current amongst old people in some outlying villages that some cultivators of the "Razu" class were brought down from the adjacent Godavery Delta to persuade and teach these ryots to puddle and transplant their crops. The system of single planting now widely prevalent in this Delta had very probably its origin in these early attempts at transplanting. The ever cautious ryot might have planted his paddy seedlings in the same way as he would do his ragi and finding that his first attempt was a success and the plants stooled profusely in this rich alluvial tract, might have adopted this system in general. By the way it may be said here that this single planting even now in its true sense of the term is carried on only in the central tract of this Delta.

The success of these early attempts at transplanting being assured, the wet cultivation spread rapidly all over the Delta and today we find, with a few exceptions on the fringes in the upper reaches of the canal, the whole Delta practically one sheet of rice fields. It was a necessity in several cases in this flat Delta that when fields adjacent to a dry block were converted into wet the dry piece could not but be treated as wet, as, otherwise, the soil becomes alkaline and infertile. Thus the process of converting dry into wet proceeded *pari passu* with the spread of irrigation into the interior. The area intended to be irrigated by canals originally designed has already been exceeded and further extension is not possible.

System of cultivation:—In the course of cultivation of paddy in this tract, there has evolved a system of practices peculiar to the tract and arising out of the circumstances due to soil and climate. The soil which is a heavy black loam, alluvial or regar, contracts and cracks into deep fissures in the hot season and as such cannot bear any vegetation worth the name at this period. It swells and becomes exceedingly soft and miry with the first irrigation from the canal. The cultivation is to be carried on only in the monsoon months and must come to a close before the hot weather. Thus, there is only

one long season crop planted out in the beginning of the monsoon and gathered at the end of November. It is followed by a crop of sunhemp to be cut after 2 months and stacked for fodder.

The Telugu ryot has got his well defined seasons, and his cultivation operations are so well adjusted to suit these seasons. They are divided into 27 periods of which 13 are agriculturally important.

The ryot takes care to commence his operations in the first five periods and close them by the 15th of August. The 2nd period is the period of heavy rains and storms during which the established paddy grows. The 3rd is the period of maturity and occasional heavy showers are expected at this time. The ryot therefore so adjusts his cropping as to get his harvests after the 3rd period is over, when clear weather prevails.

Any transplantation done after the 15th of August is considered late and the crops from such transplantings are almost always indifferent and subject to disease, although a fairly large area at the lower reaches of the channels is still planted out after this date being situated as they are at the far end of the supply channels.

Seedbeds:—Unlike the general practice in the tamil country seedbeds are invariably prepared in the dry. Soon after harvest when conditions permit of ploughing, seedbeds are broken up and kept ploughed throughout the hot season and reduced to a good tilth. About 50 cartloads of cattle manure are applied to an acre of seedbeds. The reason for such heavy application is to 'quicken the growth of seedlings and get the seedlings if possible even within 20 to 25 days for early planting as soon as water is received in the canal. From about the 15th of June to the end of the month is the usual period for raising the nursery. One or two showers of the preliminary monsoon facilitate the sowing of seed or a watering from the canal is given to sprout the seed. 4 or 5 bags of paddy seed equivalent to 600—750 lbs. are sown to an acre of seedbed, and the seedlings obtained therefrom are generally considered sufficient to plant 40 acres. Instances are not wanting of 50 acres and over being planted from an acre of seedlings. In such circumstances the planting is wider than usual, and

strictly in singles. Six women are found quite sufficient to plant in this way although the usual number is eight. Some of the well-to-do ryots of Gudivada and its neighbourhood adopt this method of planting successfully having got their seedlings raised with the help of wells sunk in their lands.

Exception to this practice of dry seed beds prevails in some villages in the Western Delta as also in some of the lands in Kollair. In these places the soil is stiff, alkaline and sticky and is unfit to be tilled in the dry state.

Manuring:—The manures in common use are pattivannu and cattle manure.

Pattivannu is simply village earth and in recent years much has been known about it from Departmental publications. Suffice it to say therefore that this earth is very largely resorted to by the cultivators and is highly prized for paddy lands. About 50 or 60 cartloads are used per acre at a time and the efficacy of the earth lasts at least 5 or 6 years. Of late, the earth is getting scarce and the price of a cartload varies from 12 annas to a rupee. An idea may be conveyed of the high value the ryot attaches to this earth when I mention that some 2 years ago, about an acre of patti land was not parted with, in an auction even though the bid went up to Rs. 7000/-.

Cattle manure:—The supply of cattle manure is not sufficient. At best the ryot is able to manure a fourth of his holdings with cattle manure every year. Even supposing that the effect of cattle manure lasts for two years, only half the area can be manured in this way. The ryot is therefore augmenting his manurial supply as far as possible by laying his hands on all other available sources.

Pig's dung has of late come into common use in parts of the Delta bordering the dry taluks wherefrom this manure is largely transported. Indigo leaf and indigo seed are also used in the vicinity of the Lankas. Margosa cake and wild indigo are applied to some extent. The surplus of dry sunhemp fodder is trampled in as manure in very many cases. Besides wherever feasible a green manure crop is also

raised. In high level alluvial loams where turmeric is grown, the soil is left in a very friable state after the removal of the crop, and gets sufficiently wet even with a light shower. In such situations the ryot invariably grows a crop of green gram with the first showers of early June, to be ploughed in during August for transplanting paddy.

Ploughing, transplanting and other operations :--Ploughing is rarely done in the puddle. As the soil swells and gets exceedingly soft and miry after flooding this process is necessarily slow. Years ago when the area was limited and each individual holding was smaller than now, puddling was a regular operation. But now the holding has increased in extent and the ryot is obliged to manage on an average ten acres of land within a limited time with a pair of cattle. He therefore ploughs his fields in the dry when the soil is a bit soft after the fall of a shower in the beginning of the monsoon. He then floods his fields straightway, just levels up unevennesses by manual labour and plants his seedlings. This is rather a perfunctory way of tillage from the standpoint of a tamil ryot. But for all practical purpose the method adopted in the Delta answers very well. There does not appear to be any diminution of yield on this account.

Another method is in vogue in certain localities. If the land has cracked well and deep in the hot weather and if irrigation water is available soon after the opening of the canal, before the rains have had any effect of closing the cracks, such lands are at once flooded and transplanting done without any attempt at ploughing. This sort of planting is considered to be the best and is known to give the highest yield. If this ideal condition is vouch-safed for the ryot he is in no need of manuring. Very probably the beneficial effect is bacteriological and is due to the sterilising effect of the extreme heat of the summer.

Subsequent operations after planting consist of only one nominal weeding and attention to irrigation. Just a week before harvest the land is given one good irrigation and the water drained out. Sun-hemp is then sown in the moist soil in the standing crop. The

practice of sowing sunhemp for fodder is peculiar to this Delta. It seems to have had its origin in the traditional instinct of the quondam dry land cultivator of the tract to maintain his working cattle in the best condition possible. Being deprived of the sorghum fodder for his cattle on account of the introduction of wet cultivation he has found a suitable substitute in the mixture of paddy straw and sunhemp.

Harvesting :—The harvest begins early in December and continues for about 20 days. The whole Delta practically matures simultaneously, and the harvesting of matured crop is to be delayed in places. To meet this difficulty most of the lands are now cropped with a variety known as “Pinna kusuma” which does not shed its ears so easily. The paddy is not of a superior quality, but as it is mostly exported this point is ignored. The harvest is not immediately followed by threshing. The crop is cut and left in the field for three or four days and then bundled and stacked to be threshed at the ryot’s convenience. Usually the ryot takes up his threshing when “Paira gali” or south east wind begins to blow steadily from about the 15th of February. Then alone he is able to dress his grain thoroughly and quickly. At this time of threshing his sunhemp is also ready which he cuts, dries and stacks along with paddy straw.

Before concluding, I wish to touch on a few more points in relation to the subject.

Necessarily with the expansion of irrigation and the inclusion of all the available area under the wet ayacut, a large portion of the Delta has become ill-drained and alkaline. One of the surest means of successfully cultivating such lands is to transplant them very early in the season, and get the crop well established before the heavy rains.

There is a crying need therefore in the Delta to find out a variety of paddy that would grow well when transplanted late and also withstand the ill-effects of submersion. There is another equally important need for a variety suited for alkaline land.

Would it not therefore be a boon to this part of the country if our Agricultural Department evolve suitable strains for the purpose referred to? Is it too much to expect that boon to be within a measurable distance of realization, now that a special paddy breeding station has been recently started in this Central Institute? I hope not.

Certain aspects of cultivation in the Godavari District.*

Leaving aside from our consideration the hill or agency tracts the Godavari District may be broadly divided into :—

- (1) the Deltaic portion and
- (2) the Uplands.

The Deltaic portion is chiefly characterised by the presence of heavy soils formed by the Godavari. In the upland portion, light soils red sandy loam predominate with an appreciable extent of red alluvium formed by the hill streams and a small river that flows in the district—namely the Yelleu.

The Uplands are well drained and the Delta suffers from ill drainage. This district is favoured by an annual rainfall of about 40 inches and the South West monsoon accounts for more than 26 inches. The North East monsoon gives about 12 inches but spends itself in a very few days, while in the other, rainfall is more evenly distributed. The Upland tracts which receive their rain along with other portions are, however, able to sow and raise their chief rainfed crops earlier than the Delta which grows wet paddy mostly. In the North East monsoon season, both tracts raise pulses. In the Uplands, themselves, villages nearer the hills get their rain earlier than other parts.

*Paper by Mr. V. Muthuswami Iyer, Dip. in Agri. for the last Agricultural College day and Conference.