

your single seedling sufficiently close so that no space is wasted without being utilised by the plants.

Seed selection.

Seed is selected for some desirable points in a crop such as purity, power to produce large number of tillers throwing out earheads in quick succession, general vigour, uniform ripening, strength of straw etc. But for all practical purposes it is enough to select seed from single plant true to variety with largest number of ears all ripening at one and the same time and to sow the seed and transplant the seedlings separately in a patch of good soil. From this "seed patch" the best plants should be again selected and their seed sown in the seed patch of the following year and the seed from the remaining plants used and multiplied for general sowing. In this way a good strain of seed can be established in a few years and with such seed it is quite reasonable to expect our crops to yield better than is ordinarily the case. The Manganallur Farm has sold about 14,500 Madras measures of pure seeds for this year's sowing, as there were good reports of the seeds sold last year.

A. Rama Rao.

Pumping Installations.

In order to study the economic conditions under which the pumping installations that have already come into existence were working, I visited 89 installations in Chingleput and South Arcot Districts. The main feature that I noticed about these installations was that they were a success in most cases wherever the owners were capitalists. Non-capitalists did not generally fare well. Besides capital various other causes contributed to the success or failure of the installations. They are:—

1. Adequate water supply.
2. Proper care in the selection of the machinery and its subsequent careful up-keep.
3. The provision of a working capital for running the engine.

4. A carefully planned programme of crop.
5. Execution of timely repairs to the engine
6. Efficient Management.

2. The first point to be attended to in the successful working of a pumping installation is an adequate supply of water. Without it the installation of an engine is practically a waste of money. Several of the wells wherein installations have been put up by private agency were not tested in regard to their capacity to supply water. On account of this, several of the ryots have had to dug inner wells to supplement the supply in the major wells. In one or two cases the installations themselves had to be removed resulting in loss to the owners. Ryots should therefore before launching on a pumping scheme ascertain by careful observation whether the supply would be adequate. To avoid any possible mistakes in calculation by the ordinary ryots they are advised to seek the assistance of the Argicultural Department who on payment of an initial fee of Rs. 10 will arrange to have the locality inspected by an officer of the Department and advise the applicant on the feasibility of the project. If the project is a big one it is always desirable to have the source of water supply tested by means of a pumping set. There are instances in which parties applied for loans for pumping installations but who were reluctant to pay this initial fee of Rs. 10. This evidently shows that they do not understand the importance of the preliminary inspection on the result on which depends the success or failure of the installation.

3. The next point is the exercise of proper care in the selection and erection of the machinery and its subsequent careful up-keep. It is only by chance that the ordinary ryot is able without professional aid to instal an engine of required Horse Power with the appropriate size of the pump. An instance was noticed by me in which a ryot (of Anichambalayam Villupuram Taluk) installed an engine of 6 Horse Power with a 4" pump without professional advice. The engine did not supply water properly and even then the owner did not choose to ask for professional assistance to find out the defect but seeing that his installation was not a success he sold the engine which he

originally bought for nearly Rs. 2000 for Rs. 900 subjecting himself to a heavy loss. This engine was purchased by a ryot of Valavanur and is now working well with a 3" pump. The man expressed great regret that he did not know when he sold it that it could be worked satisfactorily with a 3" pump. If he had only consulted professional men then and there, he might not, perhaps, have been in need of disposing of it and instead of incurring a loss he might have gained considerably by it.

4. The selection of the machinery is very important especially in the case of second hand plants. To all external appearances second hand plants appear to be good but after a short time they get into disorder frequently. A good deal of expenditure has to be incurred to set them right and then there is the worry and delay in securing the required parts. There are several instances in which second hand plants gave a good deal of trouble to the ryots and in one or two cases have even cost them more than a new engine. I found a tendency among ryots who own second hand plants to ask what is to be done if the new engine gets out of order similarly but they entirely ignore that the chances of a new engine getting into disorder are very few and in most cases there have been no complaints regarding them.

5. Having ensured a good water supply and having put up an installation, the next point is its up-keep. In many installations no trained man has been employed to run the engine. This is a very important fact which ryots generally ignore. Persons with no technical knowledge but who only learnt to start and stop the engine have been engaged as drivers on very low pay. These are mostly the farm servants of the owners and they are able to run the engine only so long as it gives no trouble. But no sooner it gets into disorder than the owner has to run for professional aid and this does not always come in right time. Some ryots complain that they do not get good drivers and even if they do they do not stay long. The solution of this difficulty lies in them only. Ryots who choose to invest so much on machinery grudge to pay good wages to the

drivers with the result that bad wages secure only bad men and even if by chance they secure good workmen they are always on their tip-toe looking for better wages. Persons who have engaged whole timed drivers certify to their usefulness and in the end this course is more economical. Under their care the engine is always kept neat and tidy and this means that it will work for some more years. In an installation in Valavanur I actually noticed that crude oil was being used in place of lubricating oil and it needs no saying how long the engine will work under such circumstances.

6. The next thing is the provision of a working capital for running the engine. Persons who go in for an installation should realize the fact that it requires now Rs. 3 to 4 per day to run the engine and they must provide a sufficient capital beforehand for this purpose and this should be renewed every year as soon as the crops are harvested and converted into money. There are several instances in which the absence of such a provision contributed to the failure of the installation. The question of providing enough working capital is therefore very important. A ryot should exercise the same foresight in this respect as he does in regard to the storage of fodder for his cattle. It is therefore advisable to store up the requirements for a full year in advance so that he may be free from anxiety later. By buying in a lot he gets the oil etc., at a cheaper rate and this compensates for the loss of interest on the money invested in the purchase of a year's requirements. This is actually being done by some ryots.

7. One of the chief reasons attributed to the failure of several of the installations is the difficulty in getting timely repairs executed to the engine. I have heard this complaint mostly from those who have not engaged trained drivers. The raw unprofessional man who looks after the engine is the cause of several of the disorders in them and the difficulty experienced in getting timely repairs done, all the more speaks in favour of the entertainment of trained men as drivers. Under the latter the engine very rarely gets out of order and even if it does they would be able to make temporary arrangements until professional aid could be got and the owners can thus be safe about their crops. To provide against contingencies the owner should also

arrange to have spare parts of those portions of the engine which wear out soon. The ryots are also advised to compound their installations.

8. The next thing that a ryot is to attend to is an efficient programme of crop. Having installed an engine at a heavy cost the aim of the ryot should always be to get as much out of the land as possible. The ryots may seek the advice of the Deputy Directors of Agriculture in this matter. An instance is quoted on page 26 of the Madras Agricultural Calender for 1917--18 in which a certain gentleman is employing a $3\frac{1}{2}$ Horse Power Engine and a 3" pump for the irrigation of only 3 acres. But the crop raised is tobacco and he is reported to get a gross income of Rs. 3,000. Another instance was noticed by me in Seruvadadu of Villupuram Taluq. There a gentleman has about 40 acres in one block with no irrigation facilities. He started an installation 4 years ago of a 14 Horse Power Engine with a 6" pump and he is now cultivating about 30 acres of paddy and 10 acres of sugarcane. Last year from sugarcane alone he is said to have realised a profit of Rs. 3,000. He said that he expected to get Rs. 5000, but some damage occurred to the crop by the cyclone of November last. Before the installation, the lands could not even fetch a rental of 10 Rs. per cawni but now the same lands fetch a rental of Rs. 50 per cawni.

10. Lastly there is the question of efficient management. To efficiently manage a business the master should know the details of it. He ought to be able to learn enough about the engine so as to be able to teach or advise the driver and he can then be sure that his driver will attend to the work with greater care. I noticed several engines lying idle and when asked why, I was informed that the owners do not take any interest in them. The engines when they are left uncared for soon deteriorate in value. Several installations had to be removed owing to inefficient management. To quote an instance there was an installation at Sennirkuppam in Saidapet Taluq. There the area cultivated with a 4" pump was only 4 to 5 acres when actually 15 to 16 acres can be irrigated under it and the owner was a non-resident. There are several other cases in which the maximum area of crops that can be raised under

the engine was not cultivated which means so much increased profit was lost to the owner. The following may be cited as instances of efficient management. A gentleman in Pettai, Saidapet Taluk, is successfully cultivating wet paddy in about 25 acres solely with the aid of a pumping installation and he is realizing a net annual profit of not less than Rs. 1,000. In another case a Muhammadan gentleman of Yemminganur, Bellary District hired an engine from this Department with the object of baling out water from a well and deepening it. Last year he raised sugarcane in about 2 acres and the profits therefrom were enough to pay up all the engine charges and in addition he realized very good profit by making use of the engine water for indigo vats. Seeing the paying nature of the concern he has applied for a loan from Government for the purchase of an oil engine and pump for himself.

10. The engines that are used solely for cultivation purposes are idle from 4 to 6 months in the year. The ryot does not realize that for every day on which the engine is idle he is losing something in the shape of interest and depreciation of machinery. It is therefore desirable that some industrial plant suited to the locality should, wherever circumstances permit, be attached to the engines for work when they have no pumping to do.

K. R. Sundaram Aiyar.

Loans Tashildar.

**A Peep into the cultivation of paddy in (Theri)
lands (sand dunes) of Tiruchandur
Taluk, Tinnevely District.**

While I was returning from Kulasekarapatnam during my holiday trip I halted for a day at Ammapuram and during my evening ramble my attention was drawn to a greenish patch of about 20 acres at a distance of about a quarter mile amidst an area of a couple of hundred acres devoid of crops and other trees, except a few palmyras scattered over here and there. As it was