

We deeply regret to record the death of Mr. J. H. Barnes, B. Sc., F. I. C., F. C. S., Imperial Agricultural Chemist at Pusa on the 2nd of June 17. We offer our heartfelt condolences to his bereaved family.

### **Some Suggestions to Tanjore Mirasdars.\***

As paddy is the most important cereal in this Presidency and the District of Tanjore possesses the largest area devoted to the cultivation of this crop, the Department of Agriculture recognised the necessity of starting enquiries, in 1908, about the condition and the practices under which the crop is raised and soon found out that there was a reasonable scope for introducing improvements calculated to increase the yield for the benefit of the ryots whose sole concern is to grow paddy which gives them food and all requirements of life.

Ultimately in 1902, an Experimental Station was started at Manganallur near Mayavaram chiefly for the trial of various manures and methods in order to enable the Departmental Officers to give correct and definite advice on the various important points from the results obtained at Manganallur where the soil and other conditions are the average of those generally prevailing in the Tanjore Delta. It is necessary to work for several years and watch the results to be certain of the advice offered. We will now consider our subject in some detail under the following heads:—

#### **Manuring.**

You all know that this involves a great problem in our district where the area is large and the sources of manure supply are extremely inadequate. The small quantity of cattle dung that is produced is also burnt up as fuel. The only manures that are therefore available

\*A paper read before the Kumbakonam Agricultural Association in May 1915 with Mr. D. T. Chadwick I. C. S. in the chair.

are the ashes and the sweepings of the household and those are hardly sufficient to manure the nurseries and the Kuruvai or the double crop fields which form only a sixth of 10,83,000 acres of wet area of the district. In other words, 9,02,500 acres of Samba or single crop land are cultivated year after year without manure and if this goes on unchecked a time must come at which the annual yields will become constant and that a low general average. Yet the population of the district and Presidency is increasing steadily, which means a steady increase in the demand for our food grains chief amongst which comes rice. We cannot therefore stand by and see the yield of our land fall to a low dull level. To avert such a mischance, we must use every endeavour to increase the yield, and to do this we must find means and methods by which suitable manures can be produced, or obtained at a reasonable cost.

#### **Green manures.**

Of all the methods, the growing of green manure crops on the land itself, is of prime importance and it costs the ryot only the price of the seed. The Agricultural Department has already succeeded in introducing this practice to a fair extent in this district. For instance, in the northern portion of the Shiyali Taluq where the soil is loamy, about 800 acres of wet land were grown last year with wild Indigo for green manure and this was, of course, during the period the land had otherwise to lie idle and be full of noxious weeds, and these lands bore a better crop of paddy than similar lands not so manured in the neighbourhood, and it is a matter for gratification to know that about 100 acres of this land have become self-sown with seed of last years' wild Indigo crop.

As wild Indigo does not grow on stiff delta soils which form the main portion of the district, the Department has introduced from Bengal a green manure crop known there as daincha, and this is found to grow well on these soils. About 200 acres to our own knowledge have been grown with this crop for manuring this year.

The seed is simply sown in the standing crop of paddy just at the time of draining the fields, three weeks before the harvest of the crop.

so that the seed may get a **good** amount of moisture for satisfactory germination. The **draining of the fields** should however be, thorough, as the seed that lies in the **standing water** even for a single night will rot away. At Manganallur the daincha seed that was sown immediately before draining the fields germinated better than that sown afterwards. Daincha stands drought though it is greatly benefited by occasional rains during its growth. Though there was not even a drop of rain after sowing daincha in January last at Manganallur, the crop lived on till the middle of May when it was cut being 4 to 5 feet high and stacked or pitted to be used later for manure.

I may here mention that in the manurial experiments conducted at Manganallur, the plots where daincha was applied as green manure, yielded from 80 to 360 Madras Measures of paddy per acre more than the unmanured plot. The total cost of daincha was about Rs. 2 an acre. Speaking of the advantages of green and other bulky manures we must not neglect their use in improving the physical texture of the stiff soils which become hard lumpy and too impervious for the free movement of water and air when they once get wet and again dry during the heavy rains which occasionally occur before the receipt of water in the channels. In this case any amount of ploughing cannot render the soil sufficiently loose and free for the healthy growth of the crop during the season. During such adverse years as these the crops grown on unmanured single crop lands look pale and sickly while those grown on the double crop area are little affected. The reason for this is quite obvious. The land which is regularly manured allows the soil particles to be loosened and separated easily by ploughing and enables the crop to send its roots more freely into the soil and grow under healthier conditions.

It therefore behoves every Mirasidar to grow green manure crops suited to his soil on an adequate scale and improve his lands.

#### **Phosphatic manures.**

Of the various phosphatic manures that are being tried at Manganallur, superphosphate and Fish manure have so far been found useful for these delta soils which are generally deficient in phosphoric acid.

Superphosphate can be applied at the rate of 2 cwts. per acre either alone or in combination with green manures. In the latter case a cwt. is generally enough. Last year it was also tried in about 40 private holdings with profits varying in most cases from Rs. 2—8—0 to Rs. 18—0—0 per acre after paying for the manure. When the catch of fish on the West Coast is plentiful, which unfortunately for the last two years has not been the case, fish manure costs about Rs. 3 per cwt. and about 3 cwts. per acre are found to be a good application. Last year at Manganallur a plot manured with fish manure at 400 lbs. per acre gave 226 Madras measures of paddy more than the unmanured plot or an extra profit of Rs. 10 per acre after paying for the manure.

#### **Farm yard manure.**

As cattle dung is the first of all manures, the oldest employed and the most general in use in every country, it should not be neglected, though we are now bowing to the inevitable, as regards wasteful practice of burning the dung for fuel. The remedy consists in increasing the fuel supply by growing live fences and fuel trees along the bunds which are sufficiently broad and extensive in most holdings. We have got the babul tree which grows luxuriantly everywhere in the district and this has simply to be propagated in regular lines on the broader bunds. If fencing wire is attached to these trees by means of staples, a cheap fence is formed and it will serve to protect the land against stray cattle which destroy the crops, and the prunings and loppings will be useful for fuel. The babul pods form a valuable food for cattle in dry months.

In the district of Chingleput we meet with very effective korkapulli fences which answer the purpose equally well.

Returning to the subject of cattle manure the box system of preserving the manure is found most advantageous at the Manganallur Farm. In this system both the liquid and the solid excreta of cattle are preserved and a manure which is twice as good as the the dung ordinarily heaped in the open, is obtained because the urine of cattle

contains as much manurial matter as the dung itself, not to speak of the much increased quantity obtained.

Under this simple system, the cattle sheds are sunk two feet below the surrounding level and the manure is allowed to accumulate to that depth under the bullocks which are given a bedding of waste straw or other rubbish every day. This absorbs the urine and keeps the standing dry.

### **Economical planting.**

The ordinary seed rate of paddy in this district has been 36 Madras measures per acre which is unnecessarily heavy. But through the Departmental propaganda for these 8 years the seed rate has been reduced to 8 to 20 Madras measures in many parts of the district especially in Nannilam, Negapatam and Mannargudi Taluks. Though the average for the district has come to half the original rate there is even then saving of Rs. 1—8—0 per acre and this amounts to Rs. 16,25,500 on 10,83,000 acres which is about the total wet area in the district. There is every scope for further reduction as the seed rate at the Farm comes to about 7 Madras measures per acre. But the great thing is not to overcrowd the seed-bed. We use one cent for one Madras measure. It must not be supposed that mere planting with single seedling is all that is necessary for getting increased yields. But it must be remembered, that planting with single seedling or in bunches without manuring only tends to impoverish the soil, though in bunch planting the soil is ruined quicker owing to the large number of plants, each yielding a few earheads, drawing their plantfood from the already exhausted soil. In other words it should not be supposed that a bunch, say, of 6 seedlings altogether producing 12 earheads, is better than a single plant producing 6 earheads in an unmanured field as each plant has its own demands to make on the soil. If you plant single seedling sufficiently close even in starved lands you get a better income, but starving the land under any circumstances is not advisable.

But when your soils are naturally poor and when you cannot manure your lands under unavoidable circumstances, you must plant

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.

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## **Pumping Installations.**

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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.