

When slowly mould board ploughs, like the Climax (which was tried by the writer and warmly appreciated here), come into greater use, the ploughing in of green manure crops will be an easy affair. It is worth noting here that the Climax plough is being worked by an average sized pair of this locality and it turns out much better and more thorough work than a country plough. It may be necessary to rotate one green manure crop with another to suit the changing conditions brought on by green manuring. A field may with advantage be not under a green manure crop for a year just as land is fallowed in regular rotation.

If a green manure crop is on a fertile land or the growth of the crop is very thick the land often requires a dressing of a phosphatic manure. This is probably due to the increased nitrogenous and other matter supplied by the green manure crop, requiring a proportionately increased supply of phosphates to enable the crop to take full advantage of the situation.

The above points are being brought to the notice of the ryots through the efforts of the Agricultural Department and even the few people that had taken wrong lines and got disappointed are one by one coming forward to take it up again.

K. Unni Krishna Menon.

Some experiments in Manganallur Agricultural Station.

While on a visit to the Manganallur Agricultural Station, I had the opportunity of meeting a retired government official who is spending the days of his retirement in taking care of his lands which he probably purchased during his official career. He had heard of the Farm in his district of Tanjore where he was told that improved varieties of seed could be obtained and with the object of obtaining them and getting some information about the improvement of his lands, he visited the farm one morning. He evinced a great deal of interest in all that the Manager had to say and he congratulated

himself on having actually come and obtained the information first hand. But he eventually finished up by saying "these experiments are all so expensive," meaning that the ryots cannot follow such methods. It had to be explained to him that because the ryot is poor, the department is undertaking the work of investigation in his behalf and that it did not follow that the cultivator should follow all the experiments because the Government is doing, but choose only those which suit his conditions best and which are within his easy reach.

I was not a little surprised that educated and enlightened as the Government official was, he had not caught the spirit underlying the institution of such an experimental farm, and it occurred to me that there may be a very large number even among the readers of the Journal who do not know the object of the Government farms and the nature of the experiments conducted therein. This then, in short, is the only excuse for this article.

Manganallur is situated in the Tanjore district, where the chief crop grown is Paddy under the Kauveri delta. Naturally therefore the problems that require elucidation would be those concerning paddy.

In Tanjore district it is often the practice in double crop wet lands to take a crop of 'Udu' consisting of a mixture of Kuruvai and Ottadam paddy. These are mixed in proportions which vary according to locality. Both grow together, but Kuruvai matures earlier and is harvested along with the growing Ottadam which latter is allowed to sprout again. As there is not enough manure for both the crops, the cultivators apply what little cattle manure they can get to the first crop leaving the Ottadam to take care of itself. The problems that suggested themselves to the department were, whether it would be profitable to manure the second crop also and if so what manures could replace or supplement the present available cattle manure. To this end, several plot tests are made with Nitrogenous, Potassic, and Phosphatic manures, to find out which are most profitable for paddy under conditions existing in the Tanjore delta. In one series cattle manure is applied to the first crop and artificials to the second and in

another series the manures are reversed. In each district there are to be found organic manures which if they could be proved suitable, would be cheaper. Therefore an experiment has been instituted to test the relative advantages of cattle manure, groundnut cake, fish manure etc., In conducting these experiments, the time of application and the quantity to be applied should be considered and these are also included in the tests laid down.

The department recommends the growing of certain crops to be incorporated into the soil as manure prior to the paddy crop. Such crops may be grown on the same land or outside it. These have been found to be economical compared with other manures and at the same time have very beneficial effects on the physical condition of soils. It is, however, not known in what form the green manures are most profitable. Hence, a series of plots is arranged so that in one plot the green manure is cut and air-dried before puddling; in another it is rotted in water before puddling; in the third, lime is added at the time of ploughing in green manure and in the fourth plot, it is rotted in aerobic conditions, i. e., in conditions where there is free access of air.

Soils may be deficient in certain mineral ingredients and these deficiencies could be found by the chemical analysis of soils. The Farm soils are found by such an examination to be deficient in lime, and to decide the exact quantity required to obtain best results, plots are laid out to receive varying doses of lime, ranging from 3 to 10 cwts per acre.

From experiments so far conducted it has been found that paddy requires phosphatic manures. It has also been tested that the addition of Superphosphates to an application of green manure increases the yield more than a mere application of super, and this increase is about equal to a double dose of super. This at once proves the economy in the application of green manure crops as compared with Superphosphate which is much more expensive.

Though phosphates are known to be desirable manures for paddy, the right quantity to be of most profit has yet to be enquired into. An attempt is therefore being made to test it in varying doses of 100,

200 and 300 lbs compared with a no-manure plot, and in order to ensure more reliable results these plots are duplicated.

To go a step further, phosphatic manures may be roughly divided into two classes, namely those that are readily available to the crop and those which are not, but which, to show their effect require more than one season. These latter are however much cheaper, so that if systematically applied in large quantities, may give better results than those which are more readily available to the plant, but unfortunately more expensive. This is a problem which is being investigated at this farm on Bonemeal and Trichinopoly Mineral phosphates.

Among Nitrogenous manures, Ammonium sulphate is remarkable in its quick effects on the paddy crop and in consequence is used as a top dressing on crops which require forcing up. This is, however very expensive and its more extended use in consequence is precluded. There is however, another manure of more recent origin which has come into the market known as Calcium Cyanamide which is manufactured in India and is cheaper. A comparative test of the two manures is being made to test their relative merits.

In certain researches conducted by the Government Agricultural Chemist, it has been noted that there are two periods in which the paddy crop puts on its activity. It is suggested that by manuring during those periods, more economical results will follow in the application of manures instead of applying the full dose at the time of planting. The two periods are the initial period following on planting and a final period when the crop commences to form shot-blade. Therefore to verify these researches a three-plot experiment is arranged in one of which Superphosphate is applied in one dose at the time of planting, in the second, half the quantity is added at planting and another half at the second weeding, while the third is treated as a check plot. This then is the rough outline of some of the important experiments that are being conducted at Manganallur. It may be that some of them are entirely of academic interest, but there is no gainsaying the fact that the majority of them are concerned

with problems of immediate interest to the Tanjore ryot and if sooner or later the Agricultural Station should be the means even in a small measure of improving the paddy of the locality, its existence maintained at public expense will be more than justified.

A visitor.

Notes.

Rothamsted Agricultural Station and the War.

The work of the station had to be largely modified owing to the war. Two-thirds of the staff are engaged either in fighting or in some direct war work. Some hold commissions in the Sanitary corps, some are in the Infantry regiments, some are busy with the manufacture of a certain indispensable constituent of high explosive under the Ministry of munitions, while others are occupied with special enquiry sent in by the Board of Agriculture. Experimental and Routine work, however, is carried on as usual, this having been possible by women workers successfully taking the place of men. The organisation is thus kept in readiness for full development to deal with the problems which will arise after the war is over. (*From Nature*).

M. R. R.

The Soil-Balance of Humus and Water. "Cultivation, in that it aerates the soil, tends to increase the oxidation of organic material. The high temperatures met with during the summer months in this State (N. S. Wales) also make for the increase in the oxidation process. Thus, in the conservation of water the excessive cultivation has caused a considerable loss of organic material in many of our soils. In fact, there are many who believe that *the loss of organic material by such frequent cultivation, is more serious than the loss of water caused by systems employing less frequent cultivations.* As with all things, we usually find a happy medium, which is better than going to either extreme. Too frequent cultivation is extremely exhaustive of organic