Methods to be Adopted to Maximise Rice Production and the Development of Improved Strains of Paddy *

By

M. K. VENKATASUBRAMANIAN, B. Sc. (Ag), M. Sc.,
Superintendent, Rice Research Station, Tirurkuppam.

The use of improved strains is one of the easiest and cheapest methods of maximising yields as by this method alone it is possible to get 15 to 20% increased yield. From crop cutting experiments it is seen that the productive capacity of the improved strains increases to 33% in combination with manures. In view of the greater response of the improved strains to manures it should be possible to wipe out a great portion of the deficit by a campaign of intensive manuring in areas of assured water supply where the departmental strains are grown. There are now available strains of paddy evolved by the state suitable for the different tracts and for different seasons.

In the maximisation of yields in paddy great emphasis should be placed on the use of green manures since paddy crop has been found to respond very well to green manuring. There are various green manures like sunnhemp, daincha, sesbania speciosa, pillipesera, wild indigo etc. Sesbania speciosa in addition to giving heavy tonnage is hardy and capable of withstanding either drought or water logging. The normal area under green manure crop in the State is about $1\frac{1}{4}$ millions acres—about $\frac{1}{8}$ of the area under paddy. For an adequate application of green manure the area under green manures should at least be trebled. As this may not be possible it is necessary to grow shrubs like Adothoda and Calotropis and green manure yielding trees like Gliricidia maculata, Pongamia glabra, Cassia siamea etc. in all waste places. An average paddy crop in an acre removes from the soil 48 lb. of Nitrogen, 23 lb. of phosphoric acid and 41 lb. of potash. To maintain soil fertility it is necessary that atleast the qnantum of manurial ingredients removed from the soil should be returned to it. It is well known that the paddy crop responds well to nitrogenous manures. Oil cakes and ammonium sulphate are the nitrogenous manures in vogue. The application of groundnut cake at the time of planting at $2\frac{1}{2}$ to 3 bags and ammonium sulphate at 100 lb. per acre about a month before flowering will meet the nitrogen requirement of an average crop. The quantity of groundnut cake and ammonium sulphate required to manure 8·5 million acres of wet paddy is many times more than the quantity available. As it is not possible to produce more groundnut cake or increase the production of ammonium sulphate or import large quantities, other sources of

* Paper contributed for College Day & Conference, 1952.

nitrogenous manures should be explored. The composting of farm waste and town refuse has not been done in this country as much as in Japan and China. All farm waste and town refuse and night soil should be composted and used as manure. Town refuse compost has been found to be as good as farm yard manure and the bulky applications, besides providing the required nitrogen, add to the organic matter content of the soil. The adoption of the T. V. A. plan of indirect manuring has been found to give better yields than the direct application of phosphates to paddy crop. Fertilising the leguminous green manure crop preceding paddy at 45 lb. P_2O_5 will be profitable method of applying phosphates as the application of phosphates stimulates the nitrogen fixing bacteria to greater activity. The soils of this State are sufficiently rich in potash and the response to potash has not been appreciable.

By improved cultivation alone it is possible to increase yields upto 30%. Timely sowing and planting of the crop is a primary requisite for maximum yields. Most of the samba varieties are season bound and unless the sowing and planting are done at the appropriate season there is appreciable reduction in yield. To enable the cultivator to raise the nursery in time and prepare the plot for planting, all irrigation sources like tanks and wells should be improved and kept in perfect repair. If need be, wells should be deepened or dug and other sources of irrigation like tube wells should be made available. In the raising of seed beds it is essential that the seed rate adopted is optimum. One Madras Measure of seed sown in one cent of seed bed is the correct seed rate for a samba crop. For a short duration crop the seed rate may go upto 3½ lb. per cent. It has been found that spacing and number of seedlings per hole has significant bearing on yields. Though the number of seedlings per hole and the spacing vary with conditions, two seedlings planted 6″ x 6″ for a samba crop and two seedlings planted 4″ x 4″ for a short duration crop have been found to be most remunerative. The quantity of water required to manure a crop of paddy varies with the type of soil. It is the common practice to maintain about 2″ of standing water throughout the growth period of the crop. Experiments have shown that one inch of water let in once in three days gives equally good result.

Freedom from pests and diseases is one of the requirements for maximum yields. The loss from insects pests both in the field and in storage is estimated to be 10% to 15%. The chief pests of paddy–the army worm and the rice bug–are controlled by DDT and BHC insecticides. Zinc phosphide has been found to be a potent weapon against rodents. Blast is the main fungus disease of paddy. The evolution of blast resistant strains like CO. 25 and CO. 26, has gone a long way to tackle the problem successfully. It is necessary to evolve short and medium duration strains resistant to blast and work is under way towards this end.

To maximise production in areas of precarious water supply as in Chingleput, North Arcot and Chittoor Districts it is necessary to evolve drought resistant strains of paddy. Several artificial crosses between cultivated rices and wild paddies have been effected with a view to evolving drought resistant strains and before long the evolution of drought resistant strains can be expected. Strains suitable for water logged areas and alkaline areas are now available. SR. 26-B has now become very popular for alkaline lands. In water logged areas PTB. 15 and 16 has been grown to great advantage.

The improved seed supplied to cultivators run out in the course of a few years and as maximum yields are bound up with purity of seed it is necessary to renew the supply once in three or four years. For the proper maintenance and distribution of improved strains the nucleus seed is to be maintained at the agricultural research stations. The multiplication of seed in primary and secondary seed farms and distribution are to be done for some time under departmental supervision.