

## Some means to increase production of rice

By

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**Introduction:** The World War II has left its disastrous effects on every country. One such is shortage of food. Our country with its vast millions comprising nearly 1/5 of the world's population was even in normal times, an importing country in the matter of food grains. The present position is such that even if the world's production of rice is raised by 10 million tons it will not be possible to secure the prewar level of consumption in rice-eating countries as the deficit between production and consumption of rice is in the neighbourhood of 14 million tons. While there is an increase in the population of the country by 10 per cent, the yield of rice has been going down due to adverse causes as failure of monsoons, want of fertilisers and agricultural implements. Dr. Aldous Huxley says "That the only alternative to world-wide starvation is reduction in numbers almost everywhere and a world population policy based on birth control. Meanwhile the resources of applied science are to be mobilised for the relief of the world's hunger". Sir John Russell, while agreeing with the latter proposition maintains that the world can keep pace in food production with any foreseeable increase in population. It is possible that the truth lies in between the pronouncements of the two eminent scientists. Leaving aside the question of birth control to economists and politicians let us examine a few ways and means of increasing rice production in our country with special reference to Madras State.

It is often stated that the acre yields of rice in our country are very low when compared to those in other parts of the world. But it has to be remembered that in those countries which record higher yields than ours, the area under rice is not even as much as in some of the individual taluks of our State. Again, rice cultivation in such countries is confined to rich virgin soils, unlike our areas which have been under cultivation for centuries together, without adequate manuring. There are also other factors, such as poverty of the cultivators, absentee landlordism and insufficient manuring and the growing of rice in soils not entirely suited for rice cultivation.

In countries like Spain, California, and Italy which record very high yields, rice cultivation is confined to the months of May to September when plenty of sunshine can be had and which is really the ideal season for growing rice. The highest yield in Spain is 5,100 lb. of paddy per acre over an area of 1.2 lakhs of acres. If we take into account, the yields of the Thambraparni valley, acre yields of 5,000 lb. of paddy during the first-crop season are quite common. The fact however remains that the main rice-growing

season in our State is during the North-East monsoon period from October to January. During this period, the days of bright sunshine are very few. The success or failure of the crop raised during this season is entirely dependent on the North-East Monsoon.

Again, our rice crops, whether under rainfed conditions or under river systems are always under the threat of the failure of monsoons and diminished yields thereby. The foregoing remarks should not be taken to mean that it is not possible to increase the yields of rice in our country. It is possible to increase the yields under the existing countries by resorting to the following measures.

**Supply of water:** Rice is a crop which responds to good irrigation. When there is dearth of water, the yield is reduced by 50% and more. Again, most of the varieties of rice are season-bound. Any delay in sowing or planting in the proper season, due to want of water, reduces the yield considerably. To ensure sowing of the crop in the proper season one must have an assured supply of water at the proper time and that too in plenty. At present large areas of lands under tanks and even the deltaic areas commanded by the perennial rivers are entirely at the mercy of the monsoons. The renovation of the existing tanks that were put up several centuries ago is also an urgent necessity. While dwelling upon the means of conserving and utilising the irrigation water obtained through rain a reference has to be made to the preservation of forests so essential for regulating the rainfall and climatic features of a country. The large-scale destruction of forests which commenced during World War II has not stopped. Our demand for wood has increased with the increase of population and increase of lorries and vehicles utilising charcoal for propulsion. It is high time that an alternative source of fuel as coal is recommended to the public and transport companies, to avoid the huge drain on our forest trees. The destruction of the forests has resulted in the failure of monsoons and more frequent failure of crops. The irrigation reservoirs are there, the tanks are there, but there is no rain to fill up the tanks and reservoirs. So the maintenance and preservation of forests has to proceed side by side with the irrigation schemes so that the catchment areas of reservoirs are not denuded of forest wealth.

The irrigation water thus secured has to be utilised judiciously. The time-honoured practice especially in deltaic areas was to irrigate paddy lands as copiously as possible by allowing water to stand to a depth of 3 to 4 inches at a time. Irrigation experiments conducted at several Research Stations have shown that applying 1 inch of water once in 4 days or 2 inches once in 8 days is enough to give good yields. More than 2 inches of water is wasteful. The economic use of water will also prevent the breeding of mosquito larvae in malarial tracts besides making the surplus water available for bringing more area under paddy cultivation.

**Manuring:** Next in importance only to irrigation is manuring. A paddy crop removes from an acre of soil 48 lb. of Nitrogen, 23 lb. of Phosphoric acid and 41 lb. of Potash. These are the minimum quantities of manurial ingredients that have to be returned to the soil to prevent soil depletion.

Paddy crop had been found to respond very well to green manuring. With the pressure on land and increase of population, the securing of green leaf for manuring paddy fields has become a serious problem. The necessity therefore arises of growing green manures in the fields themselves in rotation with paddy during the off-season. Thanks to the activities of the Agricultural Department several kinds of green manures as *Sesbania speciosa*, Daincha, Sunhemp, Pillipesara and Kolinji are now available to suit varied conditions. The present area under green manure crops in the Madras State can be put down at  $1\frac{1}{2}$  million acres or nearly  $\frac{1}{8}$ th of the area under rice. As it has been found that the application of green leaf increases the yield of rice at the rate of 1 lb. of grain for every 15 lb. of leaf applied, the increases in yield is certainly remarkable. An increase of at least 300 lb. per acre or 10% increase is easily secured by the application of green leaf at 4 to 5,000 lb. per acre. To secure the best results it is desirable to apply bonemeal or superphosphate at 100 lb. per acre in conjunction with green leaf. It will be admitted that green leaf is one of the cheapest of manures as compared to other manures, especially when grown on the land itself. The present area of  $1\frac{1}{2}$  million acres under green manures in the State requires at least to be doubled if not trebled, for adequately manuring the entire area with green leaf.

Coming to other nitrogenous manures such as groundnut cake and ammonium sulphate, it is found that our requirements for manuring the 11 million acres of rice are about 3 million tons of cake and 5 lakhs of tons of ammonium sulphate. At the present conditions it will take years to produce this quantity of ammonium sulphate within the country, especially when the demand for this fertiliser is very great for crops other than paddy. With regard to groundnut cake, the demand for cattle food also becomes increasingly felt, while the production is only 1/10th of the demand. Added to this, the demand for the industrial uses of the oil within the country is not so much as to prevent the export of raw kernels to countries abroad. The possibilities of increasing the production of groundnut cake in the country in the near future are therefore not bright. Hence other alternative sources of manures have to be thought of.

The conversion of all organic wastes into valuable compost has not been as fully utilised in our country as in China and Japan. Town compost and night soil compost have to be utilised to the fullest extent as these are the cheapest forms of manures. A start

has been made in this direction and it is hoped that ryots would fully avail themselves of the opportunity. The village panchayats and municipalities can prepare compost for sale to ryots at reasonable prices.

**Use of Good Seeds:** The area under rice in Madras is nearly 11 million acres and any small improvement that is effected over this vast acreage is bound to result in considerable increase in total output. In the cultivation of rice, good seed is of very great importance. Selected seed properly preserved and sown gives satisfaction in the seed bed, does not disappoint the farmer as regards the required quantity of seedlings for planting the areas, gives a uniform stand of crop, has even flowering and finally gives a good harvest of 15 to 20% over the unselected variety. The seed has to be sown at the rate of 1 M. M. per cent for wet nurseries and 1½ M. M. per cent for dry nurseries, instead of 3 and 4 times the quantities now used. It has been found that by planting seedlings from thin-sown nurseries alone, the yield can be increased by as much as 5 to 10%. This is due to the better tillering and growth of the sturdy seedlings from a thin-sown nursery.

With regard to the spacing between plants in a transplanted field, this is dependent on several factors as fertility of soil, early or late planting, duration of the variety grown, water supply and so on. Under delayed planted conditions close planting is advised. The number of seedlings per bunch is not much consequence but in the case of wider spacing, a greater number of seedling per bunch shows some advantage over single or two seedlings. It may be stated in general that the optimum spacing in the case of *kar* or short-duration varieties is 4 to 5 inches and 6 to 8 inches in the case of medium or long-duration ones.

As it has been found that short-term varieties of 3 to 4 months duration respond better to manuring than long-term varieties, short-term varieties should be grown wherever possible.

While dealing with the subject of improved seeds mention has to be made of the seed multiplication scheme that is in progress in the State for the spread of paddy strains over the 11 million acres under paddy in the State. The area under the Research Stations being limited, it is not possible to produce seed in sufficient quantities to meet the needs of the entire district or group of districts in which the Station is situated. So there must be an agency, (in the absence of private agencies) to do the multiplication of the seed produced on the Research Station for distribution to the ryots for general cultivation and this is achieved by the seed multiplication scheme.

As already stated, rice cultivation in our State is being carried on in poor types of soil, as well as soils which are alkaline or water-logged and in some tracts under precarious rainfall. Special varieties of paddy have been evolved to withstand these conditions and they are becoming popular. The variety SR. 26-B

is becoming increasingly popular, for alkaline lands. Under the deep water conditions of West Coast, PTB. 15 and PTB 16 are popular, while in the Circars and Kollair Lake MTU. 16 is finding favour with the ryots. As rainfed crops, MTU. 17 and 18 in the Northern Districts and ASD. 4 and ADT. 22 in the Southern Districts have been found to do very well.

The increase in yield sought to be brought about by the means enumerated are likely to be offset by certain pests and diseases. The most important insect pest affecting paddy seed beds, namely the army worm of paddy can be controlled now with the help of the DDT, while the equally important rodent pest namely the rat which is a menace in the deltaic areas can be controlled by poison baits. The important fungus disease, paddy blast, which causes loss to the tune of 10% to 100% in yield is being combated by the release of blast-resistant strains of paddy of which, strain CO. 25 is a remarkable instance.

To sum up, increased production of rice can be brought about by :

1. ensuring adequate irrigation facilities,
2. by proper supply of manures especially green manures and compost,
3. by the use of good seeds as Departmental strains, adopting economic seed rate and proper spacing and
4. use of special varieties of seeds for special conditions as alkalinity, water-logging, drought and immunity to plant diseases.

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## Modification of Weather for Maximisation of Crop Production

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At the present juncture, the Indian Union is faced with the need of maximising food production. With the natural resources available in India, it should be possible to achieve this object, of obtaining the maximum yield from each crop and meeting the food requirements of the population, both human and cattle, in full. The subject of this paper is how to harness the weather to suit the requirements of the farmer.