

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.

Weather has to be utilised to the best advantage for the maximisation of crop production. Forestry is generally referred to as the 'Handmaid of Agriculture' as its influence on the climate of a locality is far-reaching. Forests equalise and regulate temperatures. Inside the forests the temperature all through the year will be lower than in the open, and in summer this difference may even be 4°F. The difference between the relative humidity inside and outside forests may be anything upto 12%. Transpiration from forests increases the relative humidity of the locality and brings it nearer the precipitation point. Hence, it is often said that forests create rain. The influence of forests on rains is due to convection currents caused by local heating of the surface air. In addition, forests break the force of high winds and restore moisture to the atmosphere. Data are available to indicate that if the wind penetrates through a dense forest to a distance of 100 feet, it retains only 60 to 80 per cent of its original velocity; if the distance is 200 feet only 50 per cent and for 400 feet only 7 per cent. Reduction of wind velocity means creation of favourable climatic influences, such as reduction of evaporation, lowering of temperature, increasing relative humidity of the air and accumulation of moisture. All these influences will increase the yields of crops, raised under the protective shelter-belts. Most important of all, forests check soil erosion and flooding. They help in the conservation of soil moisture. The water-holding capacity of forest soils is four to eight times that of an open soil in the same locality, due to its high humus content. Further, water enters through the cleavages in the forest soil formed by the roots of trees and gets soaked in the deeper layers of soil, thereby creating environments favourable for the formation of subterranean springs. Later on these springs form streamlets and rivulets which coalesce into a river. Thus, forests are helpful in the formation of perennial streams. This is perhaps the reason for the belief that forests improve the local climatic conditions and also serve as a great adjunct even for dry-farming. Planned afforestation is, therefore, the means of reclaiming lands for agricultural purposes, otherwise threatened by floods and the spread of desert conditions.

So far as Madras State is concerned, it is a good thing that we have got nearly 27% of the land under forests. But the present state of forest upkeep requires more scientific attention. The question of bringing more area under forests does not arise in Madras State. On the other hand, it may be possible to release some lands that are now under forests, for agricultural purposes. In the Ceded Districts, where the occurrence of famine conditions is more common and frequent than in other districts, the main reason may be the vast tree-less nature of the tract, resembling the steppes of Russia. The creation of tree belts in the Ceded Districts may improve the local climatic conditions and prevent soil erosion and encourage retention of soil moisture to the benefit of crops and

eventually prevent the frequent recurrence of famines. Similarly, in the East Coast proper tree belts may minimise the havoc due to the periodical cyclones striking the coast.

Generally by adverse conditions we refer to the failure of the monsoons. It is an oft-repeated statement that, "Agriculture is a gamble with the monsoons." When monsoons fail crop production becomes a failure mainly due to the setting in of drought conditions. Drought affects men, animals and plants, the last perhaps in such a manner that their subsequent revival is not possible. There is also the other side of the picture, namely, heavy floods, resulting in extensive soil erosion and submersion of crops in low lands. For checking both the extremes, forests are useful.

As a practical measure the public should co-operate with the State in setting up a "Co-operative Climatological Service" to give timely warnings of weather conditions by collection of data, careful formulation of forecasts and effective dissemination of the same. The communication system, both private and public, should give high priority to the dissemination of weather warnings issued by this organisation.

Yet, it will be better and safer if the plant breeder evolves strains that will fare normally under extremes of climate. Evolution of drought-resistant strains requires a special technique. Ample facilities are to be provided by the State to assess the drought-resisting ability of various strains of cereals, pulses, oilseeds, cotton and sugarcane. Similarly, strains that will yield normally even under water-logged conditions, created by floods, are to be evolved. Even for the creation of tree belts, it will be advisable to have quick-growing and drought-resisting varieties of trees, whose foliage may also have good fodder value.

By maintaining luxuriant forests in high level catchment areas it is possible to control damage to crops due to floods. Further, by constructing suitable dams and reservoirs, water can be stored when available in plenty for subsequent use during periods of scarcity. The Government of Madras is alive to the value of adequate irrigational facilities for the maximisation of crop production. The Government of Madras is also spending crores of rupees in improving the irrigation facilities including the renovation of the 26,000 tanks in the Madras State. Under an assured irrigational system 90% of the loss due to the vagaries of climate may be avoided. For instance, the Godavari, the Kistna, and the Cauvery delta regions always raise bumper crops of paddy, irrespective of the local monsoon conditions.

Another suggestion to overcome losses due to weather conditions is to have a judicious crop rotation, especially in the dry districts. Fragmentation of holdings must be prevented by suitable

legislation, if necessary, thereby improving the existing facilities to have mechanised agriculture on a co-operative basis. It is a sure method to have the maximum benefit from the prevailing weather conditions. The Ceded Districts may perhaps be the suitable locality for putting this suggestion of introducing mechanisation in agriculture in actual practice.

Though it is not a suggestion to modify weather, it has to be mentioned that the farmers of the different localities must be posted with all details, based on facts, as to what are the different types of adverse weather conditions and how they are likely to affect the crops under cultivation. Steps in this direction are already taken by the Director, Agricultural Meteorology, Poona and 'Crop Weather Calenders' will soon be published in all the regional languages. With these calenders and advance weather information the farmer will certainly be able to minimise the loss due to unfavourable weather conditions.

Soil Conservation and Maximisation of Crop Production

By

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One of the main factors for the present set-back in crop production is soil erosion. Our country is one among the many where soil erosion has become a menace in recent years. As far as our own State is concerned, erosion is certainly doing great havoc though it is insidious, particularly in regions subjected to the effects of monsoonic rains.

The rapid drain on soil fertility caused by erosion would not be so alarming if the lost plant food could be replaced by the application of fertilisers. But the trouble is that erosion not only removes the plant food materials but carries away the soil itself. When the fine top soil is removed, along with it are removed all the humus, the micro-organisms and the fine clay and silt material essential for the proper retention of soil moisture. The physical and chemical nature of the soil is changed, affecting the water holding capacity, the underground drainage, and the underground water supply etc. to the detriment of crop growth.

As far as our State is concerned instances of both wind and water erosion are sufficiently common and quite serious enough, to merit a greater degree of concern and attention than is evident at present. Wind is responsible for blowing away of the fine soil particles from the cultivated fields and indirectly for wave erosion along the shore lines of oceans and lakes. Hence there is an imperative need for the protection of soil. Any scheme for the maximisation of crop production is bound to be defeated if attention is not paid to the conservation of the soil.