

How Cultivation Increases Crop Production

By

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The maximisation of crop production is an all-important problem throughout the world. The prosperity and well-being of people depends on how we solve this problem. The production from land is conditioned by the operation of a number of limiting factors. As those limiting factors are overcome one after the other production goes up gradually. Agricultural scientists met in New Delhi from 6th to 9th April 1949 and tried to assess the depression caused by various limiting factors. It was then held that production could be increased (1) by 0.6% by reclaiming new lands for cultivation, (2) by 10% by using improved strains of seeds all over, (3) by about 20% when the major river valley projects reach completion, (4) by about 10% by controlling pests and diseases in the field and by another 10% by controlling pests of stored produce and (5) by 30% by resorting to timely and adequate cultivation of land and crops. That there are possibilities of increasing production is indeed heartening. The existing overall shortage of food is only 10% and given the will this shortage could be made up by a proper approach. It should also serve as a signpost for the cultivators. Increases in production at various levels have been shown to be possible in different directions. The most outstanding and substantial increase can be brought about by appropriate cultivation at the proper time and this also happens to be the easiest to adopt by the cultivators without assistance from others.

Cultivation is an all-embracing term and includes every operation done in the field for producing crops. Cultivation is done in this country mainly with human and cattle labour, and for want of labour or want of ready or circulating capital, the various cultivation operations done by the cultivators are often not done at the proper time, or are delayed. This causes a great depression in yields. The cultivators know when the operations should be done, but none-the-less are prone to be tardy for reasons sometimes beyond their control.

The cultivation of the soil has various objects. The preliminary cultivation of the soil aims at the removal of weeds before they mature and shed their seed and at the production of a surface soil condition suitable for the reception of seed and a favourable habitat for the tender seedlings. The final condition of the soil aimed at depends upon the fineness of the seed and the vigour of the germinating seedlings. Cotton, pulses, and the big-sized grains have a sufficiency of reserve food materials and the seedlings that emerge

are strong and robust from the beginning and it would be enough if the soil is brought to a coarsely powdery state. Tobacco, small grains etc., produce delicate seedlings and unless the seedbed is brought to a fine powdery condition their germination is affected and they start growth with a handicap, which is never got over by any after-care. The preliminary cultivation should aim at a proper condition of the seed bed being produced with the minimum use of capital and labour. If ploughing and other cultivation operations are done when the soil has an optimum moisture content the effort required is the least, as also the number of times the operation has to be repeated in the field. The best and the most opportune time for the stubble ploughing is after the soil is moistened enough by the first rains after the harvest of the previous crop. It may be mentioned while passing that many wet lands that are ploughed in a wet state after the receipt of water in the irrigation system at present, may profitably be prepared in the dry state itself during summer and finished in a wet state on receipt of water. This would save considerable labour and facilitate the planting of paddy early in the season, which is conducive to high yields in the end. Large stretches of lands in Tanjore that were being prepared by wet-ploughing previously, have during the past two years been dry-ploughed with tractors with advantage. This may not, however, be adaptable to all soils and all places. In stiff clayey soils as in the Circars dry ploughing may depress the yield. The Samalkota experience is that earlier the dry ploughing is done the greater is the depression in yield. If the dry ploughing is however done within a few days before planting, there is a saving of labour and the yield is not adversely affected.

If the land is prepared in time and kept ready, sowing could be done immediately on receipt of rains. Otherwise time is wasted in preparing the land after receipt of rains and sowing is delayed thereby. This has a significant bearing on yields. Most of the crops in general come to harvest during the cold weather, irrespective of the time of sowing and the early-sown crops give heavy yields and the late-sown crops give comparatively poor yields. The depression in yields caused by late sowings is quite considerable at times. Periamanjil cholam sown in September may yield about 50% less than the same crop sown by the middle of July under Coimbatore conditions. Almost every crop has its appropriate and optimum time of sowing which conduces to maximum yields. Timely preparation of land and sowing help in the aggregate to increase the overall production.

For the same reasons, paddy, ragi, and other crop nurseries should be raised early in the season, and the crops should be planted at the appropriate time. Finally, sowing and transplantation of crops influence the yield of crops more significantly than any other single cultivation operation.

Paddy crop is either sown straightaway in the field by broadcasting or is transplanted. Transplanting generally helps to increase the yields, and is more commonly resorted to in this State, where supply in the irrigation system is assured at a particular period each year. Where paddy is raised under rainfed tanks, the time of receipt of water varies from year to year depending on the onset of monsoon, and where this is uncertain, the cultivators resort to broadcasting, as being more convenient. Though this consideration could not be completely set aside, it may be suggested that wherever possible transplantation should be preferred to broadcasting as a method of increasing the yields.

Weeding is an important cultivation operation in agricultural practice. Weeds are hardy plants when compared to crops and the weeds have the upper hand in this unequal competition. Weeds have therefore to be removed as early as practicable to give the crop plants the necessary start in growth. Early weeding is therefore emphasised as one of the important factors that help to increase production. Sowing crops in rows with the help of drills facilitates the use of bullock-drawn implements for intercultivation, and is useful in areas where labour is not available in sufficiency. This is well evidenced in the Ceded Districts where sowing crops in lines and the use of bullock hoes for intercultivation are common features. With low and uncertain rainfall, the people of the Ceded Districts know too well that they could not afford to let the weeds grow their own way. They are aware that early weeding conduces to better crop growth and yields and are eager to remove the weeds early and give the crops the necessary start in life. Timely weeding helps to increase the yields of crops.

Placement of fertilisers: Considerable work has been done in other countries on the method of applying fertilizers. The best out of the fertilizers is had when they are placed close to the seeds in the field and the recommendation is to place the fertilisers in bands or strips 1 to 2" on the sides of the seed rows and 2"-4" below the level at which the seeds are placed in the drilled rows. Phosphates assist greatly in root development and its absorption by plants is greatest in the early stages of growth. It is best applied to the land before seeding or at sowing time. The placement of phosphates in bands near the root zone of plants does not dissipate the phosphates by fixation in the soil to the same extent as when it is broadcasted.

The application of ammonium sulphate to rice to supply upto 40 lb. of Nitrogen per acre under South Indian conditions is known to increase the yields appreciably. Three-fourths the quantity may be applied at planting time or within a month of planting and the rest a month before heading for best results.

Irrigation greatly influences the yield. The optimum quantity of moisture that conduces to the most economic yields should be applied to the soil. Rainfall is erratic here and confined to short periodic phases not spread over the entire growing period of the crop. Water lifted from underground sources entails great cost and difficulty and hence an economical use of irrigation water is emphasised.

Finally, there are regions of deficit rainfall like the Ceded Districts and the Central Districts. The proper conservation of rain water and soil assists in giving an assured yield normally, while haphazard cultivation and cropping methods often lead to failure of crops. This is a common feature in the Ceded Districts. The total rainfall is generally low and the rains are confined to certain periods. The dry-farming methods developed at Hagari and other dry farming research stations show conclusively that by proper conservation methods, crop production could be stabilised and the effect of the vagaries of the rains nullified to a certain extent by contour bunding. Bunds put up along the contours hold the rainwater that would otherwise flow over the land and be lost, carrying away from the surface fine silty and fertile fractions of the soil by erosion. The held-up rain water soaks into the soil for use of crops later, leading to a sort of stabilisation of the resources and insures crop production.

A brief review of the possibilities of increasing production by cultivation methods has been given. Agricultural scientists estimate that the production of land could be increased by nearly 30% by the adoption of proper and appropriate cultivation methods. These depend to a large extent on the personal skill and diligence of the cultivator and the resources at his command. Skill and diligence are personal factors and it behoves every cultivator to make the most of his resources, limited or otherwise, to increase crop production, by proper adjustment of the cultivation methods to his skill, resources and the requirements of the soil and the crop.
