

remains to be satisfactorily explained. Most of the area newly brought under the plough will be poor in fertility and generally unsuited for the cultivation of improved varieties. They probably proved unremunerative to the farmer who preferred to abandon such areas in subsequent years. The development of such new lands can therefore be best done by insisting that the cultivator must grow one or more crops recommended as suitable by the State. There is again a large extent of lands in the rice deltas which remain fallow during summer and which can be cropped intensively. The solution of waste areas and fallow lands require a bolder breeding approach. Varieties suited to deficient soil moisture, short cropping season and poor fertility have to be evolved. They require the application of the latest breeding methods like distant hybridisation involving rare genes found in wild ancestors, exploitation of polyploidy and utilisation of hybrid vigour. The progress in all such programmes will be slow and will need the whole time of specialised workers. A beginning has been made in using hybrid vigour for the improvement of cumbu. The first fruits of such distant hybridisation with wild cottons have been obtained at Coimbatore. These new types possess extreme resistance to drought and a total crop life of 135 days. They are expected to be useful in extending cotton cultivation to regions of deficient soil moisture and in the development of extensive rice fallows of Tanjore where duration is the limiting factor. We are just beginning where others have considerably advanced and with proper planning, the internal production of major commodities can be pitched upto the self-sufficiency level, making the State investment on the breeding programmes and genetic research pay many times over.

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## The Importance of Pest Control in the Maximisation of Crop Production

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It may not be easily understood how, of all agricultural improvements, the control of crop pests can contribute for the maximisation of production. Pests occurring on crops damage them and reduce the yields and when they are controlled we prevent the loss that would otherwise have occurred. Varietal, cultural and manurial improvements are directly associated with the maximisation of production, but operations carried out for control of pests cannot add to the yielding capacity of plants, but can only check the damage to crops. How then can we secure maximisation of crop production through control of pests? If it is conceded that there is a



regular loss from year to year in the production of our crops in the country as a whole through pests occurring somewhere or other and the yields obtained now are exclusive of those losses, any attempt made to prevent such losses can help in increasing the net out-turn and raise the yields. That is how, pest control has its due importance in the maximisation of crop production in the country.

2. Having accepted that control of crop pests is one of the items for maximisation of crop production, it remains to be seen to what extent we can increase the production. We do not have statistics to show the exact extent of damage done to crops by pests. This cannot be estimated easily as there are various pests damaging crops in different years and the extent of damage caused by them varies with the tract, crop, variety, season and agricultural conditions. It has been said that "it costs the American farmer more to feed his insect foes than it does to educate his children. The yearly loss from insect ravages to crops come to nearly twice as much as it costs to maintain their army and navy, more than twice the loss by fire, twice the capital invested in manufacturing agricultural implements and nearly three times the estimated value of the products of all the orchards and vineyards in United States of America". As far as our country is concerned it has been assessed by authorities that the annual recurring loss due to crop pests and losses in storage can be taken as 10 to 15 per cent. Therefore, there is scope for increasing our crop production to the extent of 15 per cent through effective control of pests in the fields as well as in the granaries.

3. To some it may appear whether we cannot become resigned to this loss and make it good in some other direction. It must, however, be said that the figures of the average losses are very often deceptive in that they do not allow us to understand correctly or appreciate the losses by individual agriculturists. We need not consequently be under the impression that the individual agriculturist is forced to forego his crops in the field only upto the extent of 10 per cent. In most cases the losses may be anything from 20 per cent to the entire crop. Since we know that most of the agriculturists in our country have a sort of hand-to-mouth existence, we can understand what it would mean if a petty cultivator has to forego most of his crop in a particular year. The loss is not only for that year for him, but his economic condition also gets further undermined and the effect of such a loss is felt by him over several years that follow. The *ber* fruit fly and the pomegranate borer pests have rendered the growing of these fruit trees unprofitable and the area under them have dwindled. Mangohoppers threatened a similar situation in Chittoor. Cabbages could not be grown successfully on a commercial basis in the Krishna district till an effective remedy was forthcoming for its pests. The earhead bugs of paddy and



cholam inflict severe loss on these crops in some parts of this State. It can be seen that there is every need to save the ryot from such uncertainties and losses.

4. Protection is the primary duty of any State, whether it be from external aggression, internal disorders, unsocial acts, or epidemics. Many of the advanced countries in the world have a well-organised machinery to afford protection to the agriculturists in the form of crop protection and animal husbandry sections. In our State, Plant Protection is in its infancy and requires careful nursing to develop it to the extent obtaining in more advanced countries.

5. A beginning has been made in 1949, the first year of plant protection service, towards maximising production. Grasshoppers, cutworms, red hairy caterpillars, earhead bugs, jassids, and rodents are the worst pests of crops and if these are controlled, there will be a significant increase in crop production in general in South India. We have now effective remedies against grasshoppers, cut worms etc. and efforts are being made to popularise these methods of control among the ryots. We have yet to find an effective method for controlling the hairy caterpillar pest. There are other pests like jassids, tingids, thrips, plant lice, etc., which may not cause spectacular destruction of crops but heavily reduce the yields. We have fortunately now with us insecticides of high potency, fairly cheap and easily available, such as BHC, DDT and zinc phosphide and we can now be confident that we can control most of the pests. In the use of the latest drugs on a large scale, there may perhaps be a doubt whether we are right in using imported materials instead of relying on indigenous products. But there is considerable difficulty in the indigenous drugs competing with the synthetic products in collection, preparation and standardisation. Still, this line has been explored to some extent with pyrethrum, tobacco, Lobelia, Sweet flag, Thevetia, Tephrosia, Anona, Neem, Pedilanthus, Gynandropsis, etc. but till we bring these into large-scale use in plant protection, we have to rely on the synthetic insecticides that have already established their utility.

6. In maximising production we have also to concentrate on crops like paddy, sugarcane and cotton, which are in great demand at present though the other crops cannot be neglected. We have got fairly satisfactory remedies against pests that feed on the surface tissues of plants. It is only the borers that live and feed internally that are still evading control. All possible attempts are being made to follow their life histories and habits to get at their vulnerable points when some of the latest synthetic insecticides can be used effectively. This line of attack is not so easy to yield quick results but has to be pursued with patience till we get at some way of utilising these drugs.



7. It may now be asserted that we have a potent weapon in the latest insecticides and that we can certainly contribute towards maximisation of production through their use. The research staff that has to work on the fundamentals has to be strengthened for intensive work to secure the maximum benefit out of these wonder drugs. There are a number of new insecticides and their combinations, on the market such as Metaldehydes, Dichloro-propane, Ovicide, etc., and it is quite possible that some of these might prove even more effective than BHC or DDT. The plant protection staff is also to be further augmented.

8. *Storage:* Due to vagaries of seasons coupled with the changing economic conditions in the country, the production of food grains is not up to our requirements. To augment our stocks of food grains in the country, large consignments of food materials have had to be imported. It then devolved upon the Government not only to protect the growing crops in the field but also the stored food reserves. The imported grains had to be examined and fumigated for safe storage. Necessary precautions had to be taken to see that these are not reinfested until released for consumption. A separate organisation of entomologists under the control of the Board of Revenue was created to attend to the problems of food storage. These entomologists, have added not a little to the country's stock of food grains by preventing losses in the produce harvested and in their storage.

9. The expenditure incurred on the plant protection and storage service is very little when compared to the other protections the State is affording to its people. The State can and should encourage this service that is now proving its usefulness to the agriculturists and secure maximisation of production to make up the country's deficit in food crops.

## The importance of disease control in Maximisation of Food Production

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All of us realise only too well that the needs of our nation for a good many years to come, are going to depend very much on the amount of food and other raw materials we can grow in our country. In many ways, in spite of all our efforts, the position is just as serious as it was in the immediate post-war years. This paper will indicate briefly the heavy toll taken by the various crop diseases and the methods adopted to check or control them, so that we may attain the maximum yields for the crops grown in this country.

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