

Integration of Agricultural Research, Education and Extension

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Of late, when public agricultural opinion is full with questions relating to price and markets, work that is in progress in a modest manner at Agricultural Research Institute, is likely to be overlooked or at least regarded as of decidedly secondary importance. It is likely that the world is suffering from overproduction of certain commodities rather than from the reverse, and to that extent the efforts of science to remove the disabilities of the Agricultural production may be regarded as of less importance than efforts to recreate or rejuvenate markets for the sale of Agricultural produce.

On the other hand, if the low prices continue for a certain period, the farmer is concerned in taking all possible steps to produce his goods at the least cost, and viewed in this light, the prosecution of research into the problem of farming is as important as ever.

It can fairly be claimed that the value of Agricultural research is cumulative and that as the years pass the work of Agricultural Research Institutes that have been established in this country progressively increases in proportion to the funds that are to maintain them. Each year, advances are being made that are of enormous potential value to the Agricultural industry. As typical examples it may be said that development of improved strains and plant materials have been profoundly, revolutionised by the introduction of certain improved varieties of cotton, Rice Oil seeds and Millets, and that the practical methods of Farmers in their production of various crops have been radically changed and also that the crop pests are being continuously brought under more effective control as a result of the work of the research at the Agricultural Research Institute, Coimbatore, in South India.

The programme of work at all research stations in the State is reviewed every half year by the Government in conjunction with the Agricultural Research Council - a body established comparatively recently, composed of Scientific men - and already the results of this

friendly review has been to secure a greater measure of co-ordination in this work of the various branches of research. The financial position calls for rigid economy of expenditure, but mainly as the result of funds at the disposal of the Indian Council of Agricultural Research at New Delhi, extension in the shape of number of schemes has been possible in the direction of investigation of crop pests. In South India, the Agricultural Research Institute, Coimbatore, has played a great part in the organisation of Agricultural Research during last 50 years under close observation and most careful records kept of everything that happened.

It is sometimes suggested that the value of the Agricultural Research is limited by the lack of adequate means of getting the results to the eye and mind of the farmer. It is questionable whether this criticism has any real foundation. All research in progress can be divided roughly into fundamental work of a somewhat abstruse character on the one hand and investigations having a definitely practical bearing on the other. As to the former, the results are usually published in technical journals and are discussed among the workers themselves, and to others interested, at meetings and conferences, for which ample provision is made. Regarding the latter filtration through educational advisory channels and through the system of local field trials, that permeates the district is necessary before results are handed to the farmers as undoubted improvements on existing methods. The filtration system is extensive as Research workers, advisory officers on the district staff, whose business it is to deal with the farmers' problems, have numerous opportunities for consultation and mutual discussions. Co-ordinated experimental work is frequently organised with its nucleus either at this Research Institute or at agricultural Research Station in the district. When the stage is reached at which the results of research having gone through the severe test of technical criticism from workers in different areas and of field trials in various localities, can be safely commenced to the growers, there are many channels through which the information can flow to him. Research Institute and Agricultural College, have their publications which are usually placed at the farmer's disposal either free or at a nominal charge. These publications which contain articles by scientific investigators, give practical information based on the latest knowledge. The Agricultural Department also, through its advisory leaflets and bulletins, and journals plays an important part in the dissemination among Agriculturists of modern knowledge that incorporates the tested findings of Agricultural Research Institute, and other Agricultural Research Stations.

The advisory officers play a two fold part in the scheme of education and research. They link up on the one side with research Institute and on the other with the district extension service, and thereby they keep in touch with Research Institute that may be investigating similar or related problems, and in this way to place at the disposal of the district staff knowledge on which the latter could not otherwise lay his hands so quickly and easily. In the special case of the Plant Protection Officers who are concerned with the field of control of crop pests, the position of the Plant Protection Officers is obviously important. From one point of view, the officers may properly be regarded as a link between fundamental research and the practitioner whose daily work necessarily leaves little time for systematic investigation.

The total number of Plant Protection Officers (Entomology) is one with one Plant Protection Assistant (Entomology) in each district in the Madras State as a part of general advisory scheme. The Plant Protection Officer deals primarily with the control of crop pests and undertakes local investigation into control measures. He keeps in close touch with the Government Entomologist, Coimbatore, to whom he sends weekly, monthly and annual reports on the incidence and control of crop pests in various districts of the State.

Arrangements are again made for members of the staff of Research Institute, and Plant Protection Organisation of Agricultural Department to deliver lectures during the Farmers' Day in various Agricultural subjects especially on control of crop pests at the request of the Agricultural Organisers acting in collaboration with local branches of National Farmers Union.

The present set up and organisation of Plant Protection Service in Madras State is inadequate to meet the problem of pest outbreak in a comprehensive scheme of intensive agriculture. The complexity of the pest control problem is fast increasing with the introduction of numerous potent and dangerous pesticides such as Parathion, Schraden, Folidol, Endrin, Aldrin, H. E. T. P., Texaphene and Clordane etc. These require careful handling. It is quite possible that our insect may develop resistant strains of their species towards BHC and DDT. Thus our research for newer and more effective drugs, along with useful parasites and predators should proceed unceasingly until our crops are free from the ravages of pests. Thus there is necessity for an elaborate organisation of highly trained personnel to combat effectively pest outbreaks. The following suggestions are offered in this regard.

The present Plant Protection Organisation should be at least doubled with two Plant Protection Officers (Entomology) for the entire state and to Plant Protection Assistants (Entomology) for each district. For quick transport of men and materials, there should be a mobile unit attached to each individual officer. Each unit should be fully equipped with sufficient number of dusters and sprayers, and adequate stock of pesticides, etc.

In our country there is need for research in the branch of Entomology. Our studies in bionomics have been confined to few pests, and a great deal remains to be done. Studies in insect tropism or behaviour are of utmost importance. Insect ecology must play an important part in placing in our hands facts on the basis of which we could predict insect abundance and outbreaks. Biological control of crop pests is yet in its infancy in India. Insect pathology is a young science, and full of promise. As a result of general awakening to the applied value of Entomology and improvement in teaching of Entomology, it is expected that more money and more men will be available for research in this direction.

It is, therefore, necessary for the intensive integration of agricultural research, education and extension that the Post Graduate Courses are immediately started in the Agricultural Research Institute, Coimbatore, for the growth of Entomology in our country.