

Agricultural Progress*

by

M. S. RANDHAWA, D. Sc., I. C. S., F. N. I.,
Vice-President, Indian Council of Agricultural Research

I have great pleasure in welcoming you to the 27th meeting of the Advisory Board of the Indian Council of Agricultural Research. A number of significant changes in our organisation have taken place since our last meeting. Co-ordination between the commodity committees and the I. C. A. R. has been stressed for long. This has now been achieved by the enlarged Board of Research and Extension which apart from containing the specialists of the I. C. A. R. has also as members the Directors of Central Research Institutes, the Directors of Commodity Research Institutes as well as the Secretaries of the Commodity Committees. The utility of this Board on the extension side would also be greatly increased when the representatives of the Ministry of the Community Development are also included. The newly constituted Board has already made a list of results of research schemes which have been completed and which can be passed on to extension workers for general adoption. It has also indicated the items on which work may be intensified and has further indicated the problems on which research schemes should be initiated. It has further recommended that the results of research schemes of the Centre as well as of the States should be classified under two categories, viz. (i) those which can be passed on to research workers and (ii) which can be passed on to Village Level Workers and farmers.

Gap between Research and Extension : The gap between research and extension is pointedly indicated by a number of facts. Though it has been known since 1955 that paddy straw washed with water and reinforced with lime becomes a palatable and nutritious food for cattle, no effort has been made to disseminate this finding in practice. Breeding of wheat which is resistant to all the three rusts is one of the major achievements of the Indian Agricultural Research Institute. If the hill areas are saturated with rust resistant wheat, the incidence of rust on wheat in the plains would decrease which will result in a very large increase in the production of wheat. Similarly, saturation of other areas with high incidence of rust with rust resistant wheat seed would also be of great value. It is unfortunate that no steps have been taken by the States to multiply rust resistant wheat seed

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according to their requirements. The facts which I have mentioned are only illustrative. There are a number of findings of research workers which are of practical value and which have not reached the farmers on a sufficiently large scale. If we apply the finding of our research schemes on a large scale there will be a sizeable increase in food production. This indicates the need of closer liaison between Research and Extension organisations.

Liaison between Research and Extension : It is very necessary that a close liaison is built up with the staff of the N. E. S. from Development Commissioners down to the Village Level Workers on one side and the research staff of the Indian Council of Agricultural Research, the States as well as of the Commodity Committees. It was with this object that the Development Commissioners of some States have been requested to attend the meeting of the Commodity Committees such as the Indian Central Jute, Coconut and Lac Cess Committees. It has further been recommended by the Board that the results of research work on agriculture as well as on animal husbandry, whether done under the Indian Council of Agricultural Research or the Commodity Committees, should be compiled subject-wise, crop-wise and State-wise, and published in the form of booklets and widely circulated among the extension staff as well as agricultural colleges and agricultural staff of the States.

Regional Research Station : Another field in which co-ordination between the Indian Council of Agricultural Research and the Commodity Committees is necessary is that of research. I am glad that a scheme for regional research Stations and sub-stations on cotton, millets and oilseeds has been drawn. These are rotation crops and as such an arrangement of this nature is possible. This will not only enable us to tackle agricultural problems relating to those commodities on a regional basis but at the same time will ensure efficiency and economy in expenditure. Moreover, research on cross-commodity problems would also be carried out on a rational basis. These regional stations would also provide coverage for fundamental research applicable to wide range of agro-climatic conditions.

Research Workers and Farmers : It is unfortunate that some of our research workers still live in ivory towers. It is very necessary that the research workers should no longer remain isolated from farmers. In China I am told, the research worker occasionally spends a part of his time in the villages and stays with the farmers

so that he can have a better appreciation of the field problems. His whole outlook and mind get attuned to the difficulties of the farmer and this guides his attitude towards research. Our research workers should also visit the villages and see the cultivation practices of progressive farmers. Only by watching the work in the field that they would be able to improve the farmers' agronomic practices. Thus they would be in more intimate touch with the farmers and problems. It is also necessary that the research workers instead of depending upon farm assistants also handle some of the agricultural operations personally.

Agronomy: Although extensive research has been carried out in the past, there are still great deficiencies in our knowledge of correct agronomic practices which can be recommended to growers. Dr. A. B. Stewart, in his report on Soil Fertility Investigations in India, had particularly made a reference to these deficiencies, and had suggested that an attempt should be made to translate the results of agronomic experiments conducted on Government farms into cultivators' practices. The Indian Council of Agricultural Research prepared a scheme for simple manurial trials on cultivators' fields, but as these trials did not have a wide coverage, the results did not come up to our expectations. A revised plan has now been prepared in which provision has been made to carry out simple fertiliser trials on cultivators' fields on the basis of the existing information. The object of these trials is to prepare manurial schedules suitable for different agro-climatic regions of the country. The scheme will also help in demonstrating to the farmers the suitability of new fertilisers, namely, urea, ammonium sulphate nitrate, calcium ammonium nitrate, etc. to be manufactured in the country.

The council has also prepared a plan of model agronomic experiments to be conducted in different parts of the country. This scheme envisages investigations on irrigation cum-manuring, the residual effects of fertilizers, rotation-cum-manuring, phosphatic manuring of legumes, fertiliser placement, seed rate, spacing, etc. and will deal with six major crops, namely, paddy, wheat, jowar, maize, an oilseed crop and cotton. Thirty four centres have been selected on the basis of soil-climate complex with special reference to the requirements of the river valley and other irrigation projects. The results of these experiments will enable us to make the best use of irrigation water in combination with fertilisers and other agronomic practices.

Planting Distance: It is desirable that the optimum distance between plants and between rows in respect of each crop is worked out by the Agronomists. The square and rectangular system of planting has been found useful in crops such as paddy, jowar, etc. In small holdings much work is largely done by manual labour and this system of planting can be very paying. In any case this is an item which should figure prominently in agronomical research programmes in respect of various crops.

Fertilizers and Organic Manures: During the 1st Five Year Plan period the consumption of sulphate of ammonia rose from 2.8 lakh tons in 1951 to 6 lakh tons in 1955. By the end of 2nd Five Year Plan period, it is proposed to raise the consumption of nitrogenous fertilizers to 18.5 lakh tons in terms of sulphate of ammonia. No doubt the application of nitrogen in the form of chemicals is useful but it is desirable if the chemical fertilizers are used in conjunction with organic manure. The practice of green manuring should be increasingly popularised. Cultivation of green manure shrubs such as *Sesbania* and *Glyricidia* along the boundaries of fields, in suitable areas should be widely popularised. Prejudice against the use of human organic waste as manure should be conquered. It is estimated that one person yields 1 kilogram of nitrogen per annum. From this source alone 36 crore kilograms of nitrogen would be available which is equivalent to about 30 million tons. For effective utilisation of human organic waste it is desirable that a large scale programme of trench latrines is carried out in villages in the community projects and N. E. S. areas. The sewage of the town which in the case of a town like Bombay goes to the ocean should be utilized for agriculture. Unless man returns to the soil what he has taken from it, soil fertility would certainly go down.

Deep Water Paddy for Pits along Railway Lines: I am glad to note that there are some schemes on deep water paddy. There are a large number of pits along the Railway lines in a number of states which can be used for cultivating deep water paddy. Already useful work in this direction has been done in Assam and West Bengal, and in other States also it is desirable that deep water paddy is developed. This alone will give a measurable increase in our food production.

Regional Research Station for Horticulture: The Indian Council of Agricultural Research have accepted the recommendations of the Horticulture Committee for intensification of research on the more

important fruits grown in the country. According to this recommendation, the country has been divided into five agro-climatic regions so that the problems of basic research would be dealt with at the fruit research station to be developed in each region. In view of the varied nature of the problems and the number of fruits to be investigated in the different regions, a number of sub-stations will also be set up in each region in co-operation with the States concerned. The chief officer of each regional station will be primarily responsible for framing the research programme of the region in consultation with the State horticulturists and will also provide higher technical guidance. The following Five Regional Research Stations will be developed.

1. *Southern Tropical Zone*: Main Station at Raour (Andhara Pradesh) with a sub-station each in Mysore and Madras ;

2. *Central Tropical Zone*: Main Station at Poona with a sub-station at Nagpur ;

3. *North - Eastern Sub-tropical Zone*: Main Station at Sabour (Bihar State) with a sub-station each in Assam and West Bengal ;

4. *North - Western Sub-tropical Zone*: Main Station at Saharanpur—Rishikesh with three sub-stations—one each in eastern Uttar Pradesh, Punjab and Rajasthan ;

5. *Northern Temperate Zone*: Main Station at Mashobra (Himachal Pradesh) with a sub-station each in the Punjab and Kashmir.

All India Fruit Shows: All India Fruit Shows are now being held under the auspices of the Indian Council of Agricultural Research. An Exhibition Officer (Hort) has been appointed for this work. During the current year, two Shows have been held. The first All India Grape Show was held at Hyderabad and the first All India Citrus Show has recently been held at Bangalore. Another Citrus Show will be held in New Delhi about the end of the December this year. These Shows are very popular with the growers, attract a large number of visitors, and have provided stimulus to horticulture.

Awards for Horticulture: To encourage proficiency in fruit growing the Indian Council of Agricultural Research has formulated a fruit crop competition scheme for judging the best orchards in the country. Judging would be done not only on the assessment of the crop yield but also on the standard of fruit growing practised by the

fruit grower. A uniform procedure of judging would be adopted both at the State and the All India levels. Growers of Important fruits like mango, sweet orange (Malta, Mosambi, etc.), santra orange, banana and apple will participate in these competitions. The best grower will be given a certificate of 'Udyaan Pandit' each year like the certificate of 'Krishi Pandit' awarded in crop competitions. He will also be awarded a cash prize of Rs. 5,000/- for this distinction.

Floriculture Committee : The subject of ornamental gardening which has been very much neglected has at last been given its due place in Horticulture by the organisation of the Floriculture Committee for which step credit is mainly due to our Minister for Food and Agriculture, Shri A. P. Jain who comes from the garden growing district of Saharanpur and takes deep interest in horticulture as well as to Dr. P. S. Deshmukh, Minister for Agriculture who has also appreciated the necessity of giving due recognition to this subject. The Indian Council of Agricultural Education at their last meeting held at Lucknow in August, 1956, recommended that landscape gardening should be introduced in the syllabi of Agricultural Colleges. As the Floriculture Committee has only recently been organised and a number of States were busy with their reorganisation plans, the number of schemes which were received for consideration were comparatively few. However, a start has been made and I believe other States will take interest in this subjects as well. In the State of Assam with its plentiful rain fall and wide and varied flora, there is considerable scope for building up an ornamental garden with an orchid house in which collections of orchids from Sikkim, Bhutan and Assam can be placed. Apart from these, plants like azaleas, rhododendrons and camelias, exotic as well as indigenous, can also be collected in the garden. Such a collection would become very important in a few years and the place where it is housed will become Mecca of botanists as well as lovers of flowers.

Animal Husbandry : Animal husbandry development, by its very nature, is a more complicated and much slower process, and the results are often difficult to achieve and seldom so spectacular as in plant husbandry. Consequently, great amount of strenuous labour and patience are required not only in the planning and execution of research in animal husbandry problems but also in the application of the results of researches. Nevertheless, we must gear up our machinery for research as well as development so as to ensure that one is not divorced from the other. Thus, our research programme should be realistic enough to quickly provide the answers and the

techniques for the efficient implementation of our development plans, and the latter should be based on sound lines and yet be sufficiently elastic to permit of maximum advantage being taken of the knowledge and results obtained through the researches.

The ultimate goal of animal husbandry research and development is preservation of our livestock and livestock resources and their progressively increasing improvement and exploitation for the benefit of mankind. We have, accordingly, to devise ways and means of not only maintaining our animals in a state of sound health and protection from diseases but also of increasing their productive capacity as quickly as possible.

Disease Control: Some decades ago the toll taken by diseases was so heavy that it had become impossible to even think of planning any concerted programmes of improving our livestock breeds. Naturally, therefore, veterinary research in earlier years was directed chiefly towards acquiring a better understanding of animal epizootics and developing efficient methods for combating them. We may well be proud of our many achievements in that field when we recall such noteworthy examples as the progressive improvement in the methods of immunization against our livestock enemy no. 1 — rinderpest — culminating in the production of the goat tissue vaccine, and the visualisation of its complete eradication from the country with the help of that vaccine, and the development of an efficient vaccine for immunizing poultry against Ranikhet disease, which had once threatened to annihilate organised poultry farming in particular and our poultry industry in general. During recent years we have seen the development of more efficacious vaccines for many other diseases, like haemorrhagic septicaemia, fowl pox, fowl spirochaetosis which are only a little less important than rinderpest and Ranikhet disease. You have now before you a number of schemes pertaining to disease problems, and I am sure you will agree that most of these problems deserve our immediate attention.

Rinderpest Eradication Scheme: Our 'pilot' scheme for the eradication of rinderpest, which was in operation in Southern India, has now given place to the All India Scheme for eradicating the disease from the country. The 'pilot' scheme has given us much valuable experience, and we are now confident of achieving our objective during the course of next 2 or 3 years in all the States. It is, however, important that no State should lag behind, and I trust every State Government will attend to this task with the priority that it deserves. Eradication of rinderpest from India is a

project of very great magnitude, the like of which has probably not been undertaken before in any field of human endeavour. The invaluable economical and other benefits that are likely to accrue from a successful attainment of the objective, for all times to come, cannot be measured.

Animal Nutrition: In the field of animal nutrition we have already acquired a considerable amount of useful knowledge about the food requirements of our animals for maintenance of health and for the various items of production, such as work, milk, eggs, wool etc. Researches conducted in India have taught us that the standards prescribed in western countries do not strictly apply to India, and we shall have to study all aspects of animal nutrition under the conditions obtaining in the different parts of the country and under varying conditions of climate and agricultural practices. Under a co-ordinated scheme financed by the I. C. A. R. three Regional Nutrition Research Stations have already been set up, and it is hoped a fourth station will start functioning soon. The proposals of the Second Five Year Plan also include the setting up of four Regional Livestock Research Institutes for conducting research on breeding, diseases and nutritional problems of regional importance. I believe the States are also taking necessary steps to strengthen and expand their existing research nuclei for tackling problems of strictly local importance and for introducing the application of results of researches conducted at the Central and Regional Research Institutes.

Cattle Breeding: The most noteworthy step that has been taken in recent years in the fields of animal breeding is the comparative study of selective breeding and cross-breeding or grading up with better foreign or indigenous breeds, for the improvement of our non-descript and unproductive breeds of cattle, especially in hilly and heavy rainfall areas. The results of this investigation should provide a definite answer to the question: what breeding policy should be adopted in such areas?

You are also aware that some years ago, in consultation with the FAO experts, we had sanctioned a co-ordinated scheme on cattle sterility, primarily with the object of improving the teaching of animal gynaecology and obstetrics in our veterinary colleges and conducting investigations in diverse problems concerning infertility in cattle. The existing scheme provides for one central station and 6 regional stations located in the veterinary colleges. The officers-in-charge of the respective centres have undergone advanced training

in the subject at Stockholm. There are 14 veterinary colleges in India, and it is highly desirable that the cattle sterility scheme be extended to the remaining veterinary colleges also. Consequently, we have invited the remaining States to submit their schemes on sterility, and we are also persuading the FAO to arrange another course at Stockholm. There is some hope that the FAO would be in a position to organise a fresh course at Stockholm in 1957-58.

Surplus Cattle Problem: Out of the world population of 800 million bovines, India has as many as 203 million or slightly more than a quarter of the world's total. Other big countries like the U. S. S. R. or the U. S. A. have only a fraction of this number. The U. S. S. R. has only 63 million bovines and the U. S. A. 84. China has only 18 millions. India has in addition 38 million sheep and 56 million goats. Though there are as many as 26 breeds of cattle and 6 breeds of buffaloes in India, the high class animals in these breeds form only a small proportion, estimated to be roughly 10 per cent. The owners of these animals are poor and resourceless and the fodder position is extremely difficult. The available resources in feeds cannot maintain even a half of the existing population in an optimum condition of health and production.

Two main purposes for which cattle are maintained in India are the production of milk and production of work bullocks. The cultivable area in India is 295 million acres. The number required to cultivate this area, assuming that their capacity is 12 acres per pair, is 24.6 million pairs. The actual number of bullocks available is 33.7 million pairs. Including the number required for carting, irrigation, etc. it is estimated that the number of bullocks is much in excess of requirements. With the introduction of Co-operative farming the number of bullocks required would also decrease. Mechanisation of agriculture would also in due course greatly reduce the number of bullocks required for agricultural operations. It has been estimated that about one lakh bullocks have already been replaced in agricultural operations by tractors and oil engines in the last five years. With increasing mechanisation of agriculture this process would gather momentum. The economy of the country is severely strained by the burden of useless cattle and it is time that we face this problem in a realistic manner so that the competition between man and animal for the limited food resources is reduced to the minimum. With the increasing population we will have to decide whether to feed the man or the unrequired animals.

Ideal Types of Cattle: A valuable suggestion that has been made to us is that for each breed of cattle and buffaloes we should lay down definite standards of an 'ideal' from the point of view of conformation and that our breeding policies should aim at achieving that ideal. A Special Committee has been constituted to examine the suggestion in detail and make its recommendations to the Council in due course.

From West Bengal has come a very interesting scheme, which aims to work out the economics of specialized dairy farming through exploitation of land for milk production rather than food-crop or cash-crop production. The nutritive value of milk needs no emphasis, and we shall watch the progress and results of this scheme with interest.

Poultry: I expect you are all familiar with our poultry development plan. Commercial hatcheries should be set up in all the States so that the development of poultry may be expedited. At present only in Madras and Travancore-Cochin States some work is being done under the schemes sanctioned by the I. C. A. R. This work should be extended in all the States. Incubators should be purchased and distributed to the Extension workers so that the people in the villages may be made to take interest in poultry development. Subject of standardised poultry feeds also require our attention. Meat of unrequired animals such as Pariah dogs, cats, flying-foxes, etc. can be suitably converted into poultry feed of highly nutritious nature. Not only this will increase egg production but at the same time these unwanted pests would be eliminated.

Literature on poultry finds an important place in our publication programme. I am glad to inform you that an excellent book dealing with all aspects of poultry husbandry has recently been prepared, and printed copies will soon be available. Moreover, our Poultry Committee, which met last month, has drawn up a fairly exhaustive list of subjects on which we hope to produce a series of small bulletins in due course.

Sheep: As you know, the proposals of the Second Five Year Plan also include a comprehensive scheme for the development of Sheep and improvement of wool in the sheep-raising tracts of the country. Our Sheep and Wool Committee this year had under consideration a scheme for the definition, commercial evaluation and manufacturing trials of graded wools of the principal breeds of sheep. An *ad hoc* Committee has been set up to closely examine this important scheme and make its recommendations to the Council.

Technical Personnel: For a satisfactory execution of our various research and development programmes we shall require the services of a large number of suitably trained personnel. We have during the last two years or so taken adequate measures to cope with the greatly increased demand in numbers of veterinary personnel, and we are now marching ahead with our programmes of improving the quality of our personnel. As a first step, we are arranging special training seminars in anatomy and bacteriology in Calcutta and at Izatnagar during the next summer vacation for acquainting our veterinary teachers with advanced knowledge and latest coaching techniques in these subjects, and we hope to make similar arrangements for other subjects in the summer vacation of 1958. In the case of anatomy particularly we are lucky to have been favoured under the inter-institutional arrangement with U. S. land-grant colleges with the services of an expert of Dr. Grossman's eminence, and in fact he has already revolutionised the techniques of embalming etc. in his work at Bikaner. We have decided to take immediate advantage of the techniques introduced by him and we have asked the States to depute their anatomy teachers immediately to Bikaner to learn those techniques. I trust the States concerned will take the maximum advantage of these special courses which we are arranging for the benefit of their veterinary teachers.

Veterinary Education: Some of the other measures of veterinary education and research under contemplation are (a) setting up of a post-graduate college at Izatnagar for providing within the country the highest possible training in certain animal husbandry subjects, (b) raising selected veterinary colleges to the post-graduate level, so that they may serve as regional centres for advanced study, and (c) setting up of regional livestock research institutes. We have already taken up correspondence with the States on these subjects, and we expect all the States will make the best use of these programmes.

Tribute to Dr. P. N. Nanda: As members are aware, Shri P. N. Nanda our Animal Husbandry Commissioner has proceeded on leave preparatory to retirement. When he joined the Council in 1947, he had behind him a wide and varied experience of several years as a Divisional Officer, as Superintendent of the largest livestock farm in the East and as Director of Veterinary Services in two major States. He brought this rich knowledge and experience to bear on the work of the Council and on the deliberations of this Board and its various Committees. His services to the Council and the country at large have been invaluable, and we all deeply appreciate the good work he

has done. He was a pleasant colleague, and a good worker, who had developed an All-India view of animal husbandry problems of India and his departure on retirement is a very severe loss indeed to the Council. Let us hope his knowledge and experience would be available to the country in some other capacity.

Publications : I am glad to note that the Indian Council of Agricultural Research have made considerable progress in their publication programme. An excellent monograph on Rice has just been printed. A monograph on Mangoes, a book on Ornamental Flowering Trees are in the press. Books on Poultry and Horticulture will be sent to the press by the end of next month. Monographs on Cotton, Jute, Coconut, Tobacco and various Oilseeds would be ready by the close of next year. A series of monographs on Algae and Fungi have been planned and I hope these would also be available by the end of next year. A new magazine on Horticulture has been started and has been greatly appreciated by those who are interested in gardening. The quality and lay-out of books and journals has been improved and I hope when the publication programme of the I. C. A. R. is successfully implemented, a great step in agricultural education would have been taken. In fact, by providing a series of books on agriculture and animal husbandry, the I. C. A. R. will be laying the foundation of a sound agricultural education based on local material and talent. These books are not only required in India but would also be of use in other countries of far-Eastern region where the problems of agriculture are similar.

Very creditable work has been done in giving a push to our publication programme by Dr. B. N. Uppal, our Agricultural Commissioner, and Shri P. N. Nanda, our late Animal Husbandry Commissioner. I also appreciate the interest which has been taken by Dr. B. L. Sethi, Secretary, Indian Central Cotton Committee, Dr. P. J. Gregory, Secretary, Indian Central Coconut Committee, and Dr. R. Sankaran, Secretary, Indian Central Oilseeds Committee, in the publication programme of their Committees. I also appreciate the good work done by Shri M. G. Kamath, Editor, Indian Farming, and Shri Prem Nath, Editor, Books, who ably edited our books and publications. I also appreciate the work done by the Art Section under the direction of Shri N. S. Bisht in providing artistic layouts for our publications. Dr. P. S. Deshmukh, Minister for Agriculture, has taken keen interest in our publication programme and his encouragement has provided stimulus to us in our publication programme; and I thank him cordially for his patronage.
