

Role of Feasibility Demonstrations in Developing an Extension Programme for Quick Results*

by

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Introduction: This is a study made on the role of 'Feasibility Demonstrations' in an Extension Programme as adopted by the members of the Agricultural Production Promotion Team of the USAID/University of Tennessee and the Tamil Nadu Agriculture Department at the Agricultural College and Research Institute, Coimbatore. The main objective of the Team is to find out ways and means of developing an Extension Programme to make the farmers in Tamil Nadu aware of the high yield potential of certain varieties, the high outturn they could get by adopting the recommended package of practices and to motivate them to grow high yielding varieties and thereby to augment food production in Tamil Nadu.

Initially, important contacts were made by the American Technicians with officials in the Intensive Agricultural Area Programme Districts of Chingleput, Coimbatore, Madurai and Tirunelveli and subsequently in North-Arcot where the Farmers' Training Programme is in operation. As maize crop could be grown all the year round giving the maximum yield of cereal food per acre, demonstrations were laid on hybrid maize. Later on, with the co-operation of the district personnel and the members of the staff of the Agricultural College and Research Institute, Coimbatore a number of demonstrations on the High Yielding Variety, IR. 8 paddy were established as part of their Extension Programme.

According to Leagans (1960) an Extension Programme is a set of clearly defined, consciously conceived, educational objectives or ends, derived from an adequate analysis of the situation, which are to be achieved through Extension Teaching. Kelsey and Hearne (1952) state that the criteria for judging objectives are: they should be dynamic; socially acceptable; attainable within the economic and other limitations of the people; should be developmental in outlook; should be easily defined in terms of the expected changes in the attitudes, skills and knowledge of the people. Based on the above principles, the American Technicians have developed an Extension Programme, the basis for which is the '*Feasibility Demonstrations*' (Anon. 1967 & 1968). '*Feasibility Demonstrations*' as such form the first important stage in the Extension Programme which has to give clear indications of the package of practices to be recommended for the crops.

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Results: A. *The Strategy*: The building of an effective Extension Programme of the kind the technicians desire, comprises three phases: (i) The first phase is the conduct of 'Feasibility Demonstrations'. (ii) The second phase is the training of the district and block staff and the innovators and the early adopter - farmers and (iii) the third phase is the mass adoption of the improved techniques by the majority of farmers. These farmers being educated through the use of field days at demonstrations laid during the second stage.

i) *Feasibility Demonstrations Phase*: These are demonstrations which are conducted at the initial stage of crop production programmes. i) to determine what crops can be produced that will materially affect the welfare of farmers and ii) to determine what levels of yields can be obtained and what problems farmers will encounter producing the crops.

These demonstrations are conducted in the fields of farmers so as to evolve the package of practices, the adoption of which would ensure high yields and at the same time minimise the risk in producing the crops.

During this stage, farmers, block staff, officials and leaders of the concerned departments were involved so that they would know what yields were possible for the various crops and what package of practices were essential, to gain the desired production levels.

While at this stage if any problems were encountered, research work should immediately be done to find solutions quickly.

ii) *Training Phase*: This is primarily meant for developing the technical competence of the field workers viz., the block staff in the use of package of practices for the different crops.

The training of the extension workers of the block is done as an action programme in the field in which the block personnel would work side by side with the American Technicians and their counterparts in laying demonstrations in the field of farmers.

During this stage mass meetings of farmers are also held in which the high yielding varieties programme would be explained, the economics of producing the various crops revealed to farmers and volunteers of farmers are requested to try the new crops adopting the recommended package of practices.

iii) *Mass Adoption Phase*: In this stage, farmers who volunteer at the time of the mass meeting at the previous stage, who would take up the cultivation of the high yielding varieties would be helped by the USAID Technical Assistants along with the block personnel. The block staff and technical-

assistants conduct method demonstrations for groups of farmers or individual farmers according to the demands.

It is at this stage, in the Demonstrations laid in the training phase where harvests are made, 'Field Days' or 'Harvest Festivals' are conducted and the press and the radio are used to give wide publicity to gather large number of farmers to witness the yield recorded.

The American Technicians and their counterparts would be holding educational mass meetings of farmers. The Block personnel together with the USAID Technical Assistants working with the American team would be responsible to gather the farmers and to attend to the followup action by showing the farmers how to plant and care for the crops to get the maximum yield.

The Block personnel and the Technical Assistants would help farmers in getting the necessary inputs such as hybrid or improved seeds, fertilizers, insecticides and fungicides and in securing timely credit and marketing facilities.

B. Action Taken: Maize-Coimbatore District: The area under maize in the year 1966-67 was only 90 ha under irrigated conditions in Coimbatore district, almost all of which were seed producing plots while 7 ha were under unirrigated conditions. Twenty five 'Feasibility Demonstrations' were laid out in Coimbatore district during June 1967 to December 1967 in a total area of 72 acres. Besides these demonstrations, from January to June 1968 134 'Feasibility Demonstrations' have been conducted in Tamil Nadu. In these 'Feasibility Demonstrations' the yield ranged from 2000 to 3000 kg per acre. These demonstrations were further supplemented with the data as obtained from the three National Demonstrations conducted with the help of the Millets Specialist, Coimbatore. Following are the acre yields recorded in the National Demonstrations.

TABLE 1. *Yield of Deccan Maize*

Village	Area (acre)	Yield (kg/acre)	Yield (kg/ha)
Sowripalayam	1.00	2538	6269
Kuniamuthur	1.00	2200	5434
Madampatti	1.00	2600	6422

Madurai District: In Madurai, at the Agricultural College Farm one plot of hybrid maize was planted, under the supervision of the college staff. Besides, seven other feasibility demonstrations were established by the extension personnel using the recommended package of practices.

Tirunelveli District: 'Five Feasibility Demonstrations' were laid on hybrid maize with the help of the district staff. The American Technicians tested the soil and supplied the required seeds for raising them.

Chingleput District: A conference was held with the Deputy Director of Agriculture and the District Agricultural Officers of Chingleput district in which the maize programme was discussed. A number of 'Feasibility Demonstrations' have been laid with the help of the district staff but the exact number of them are not known as the details have not been received from the District Agricultural Officers.

Paddy - IR. 8: The choice: The variety, IR. 8 paddy was chosen because of its proven ability to respond very well to high dosage of fertilizers. In the Philippines, after the introduction of IR. 8 paddy the country which was importing rice, was made an exporter within three years. The IR. 8 paddy similarly made Thailand an exporter of rice. In our own country also it has been found that IR. 8 paddy gave the highest yield and was outstanding in its performance.

Feasibility Demonstrations laid: In Coimbatore district with the help of the district staff seven 'Feasibility Demonstrations' were laid with IR. 8 paddy. In Madurai at the Agricultural College one 'Feasibility Demonstration' was laid. The yields recorded are furnished in Table 2.

TABLE 2. *Yields of IR. 8 paddy*

Location	Date of sowing	Date of planting	Date of harvest	Grain yield (kg/acre)
<i>Coimbatore District</i>				
Vedapatti Perur block	9-8-67	6-9-67	5-1-68	3780
Samichettipalayam Periyanaickenpalayam block	25-8-67	27-9-67	22-1-68	3345
Alandurai Thondamuthur block	5-9-67	4-10-67	3-2-68	3525
Semmedu Thondamuthur block	31-8-67	28-9-67	3-2-68	3000*
Pongalur Pongalur block	9-9-67	10-10-67	29-1-68	4150
<i>Tirunelveli District</i>				
Eruvadi	13-9-67	9-10-67	21-1-68	3250

* Owing to severe incidence of *Helminthosporium* disease there was 25% of chaff hence net yield was low.

Besides the demonstration on two acres at the T. V. S. Farm in Eruvadi, 40 acres of IR. 8 paddy was also raised at the same farm using three levels of N namely, 45 kg, 54 kg and 72 kg per acre.

In Kovilpatti area two plots of IR. 8 paddy even though raised under very saline conditions recorded an yield of 2750 kg per acre with a level of 45 kg of N per acre. These plots attracted a great deal of attention of the neighbouring farmers because of its high yields under saline conditions. During January to June 1968, as many as 125 'Feasibility Demonstrations' have been laid out in Coimbatore and North Arcot districts alone.

Several demonstrations using three levels of N were also set up in Periyakulam division of Madurai District.

These 'Feasibility Demonstrations' were designed to determine what kind of production can be expected from this variety in Tamil Nadu and to see what kind of problems farmers would encounter in its production.

C. *Findings from "Feasibility Demonstrations"*: (i) *Maize*: (1) Yields upto 4630 kg/acre could be obtained under good soil and water management with sound package of practices. (2) The yields recorded from some of the 'Feasibility Demonstrations' ranged from 2000 kg to 3000 kg per acre. (3) The crops grown in saline or alkaline soils were stunted. In the districts of Madurai and Tirunelveli the problem of salinity and alkalinity was found to be more serious than in Coimbatore. The yields were therefore reduced to 40 to 60% than the normal yields. (4) The salinity problem could be solved by irrigating the maize more often than farmers are accustomed to do, in order to reduce the percentage of salt in the soil solution. (5) Soils with 6.5 to 7.5 pH were found to be ideal for growing maize. (6) Spacing of 60 cm \times 30 cm and dibbling one seed per hole were found to be optimum. (7) The 'Band' method of applying the basal dose of fertilizers having one third of N and all the P_2O_5 and K_2O in furrows and then earthing up the furrows to form ridges over the furrows and dibbling seed at the side of the ridge to one third the height of the ridge was found to yield best results. (8) Top dressing of the two third dose of N from twenty third to twenty fifth day was found to be the best time. Application of fertilizers on the plants or closer to the plants than 25 cm would have to be avoided. (9) The inadequate supply of P_2O_5 and K_2O in the soil resulted in the incomplete filling of the ears in some plants and the resultant low yields. (10) Hybrid maize could be grown throughout the year in Tamil Nadu. (11) The crop was not found to be affected by any major pest or disease. However, Endrin granules would have to be applied as a prophylactic measure against stem borer. (12) There were indications that the low yields recorded in maize would be due to hard pan developed over the years from shallow ploughing.

(13) A modest crop of maize could give a net profit of Rs. 1200/- to 1500/- per acre easily in a crop of about 100 to 110 days duration.

ii) *IR. 8 Paddy* (1) The duration of the crop varies from 135 to 150 days depending upon season and cultural practices. (2) Seed treatment with hot water at 54 to 56°C for 20 minutes will be necessary to prevent the infection of seed borne diseases (use of Streptocycline is not necessary when hot water treatment is done). (3) Bacterial leaf blight was not observed in any of the feasibility demonstration. (4) The seedlings are to be planted between 26 and 28 days of sowing in the nursery. (5) Deep planting should not be done. Planting at a shallow depth of 1-2 cm is desirable. (6) Application of 2/3 N in the last plough furrows and top dressing 1/3 on 50th day coinciding with ear initiation after planting resulted in high yields. (7) Transplanting in rows at a spacing of 20 cm × 10 cm (8" × 4") using two seedlings per hole recorded average number of 20 ear bearing tillers per clump contributing to high yields. (8) Application of any copper fungicide should be avoided for IR. 8. (9) The leaf drying observed in IR. 8 crop is a varietal character. This is due to early senescence of this variety. (10) The yield recorded with the application of 72 kg of N seems to have been most economical (11) The yields recorded in the feasibility demonstrations ranged from 3000 kg to 4150 kg per acre. This means obtaining 4 tons of paddy which is more than 4 times the state average of 858 kg per acre within 150 days. (12) Though IR. 8 is a short-statured crop of about 95 cm the straw yield was not low. The grain to straw ratio was 1:1 and hence from a crop that would yield an average of 3500 kg/acre, an equal weight of straw was obtained. (13) Even under saline conditions, in Kovilpatti area a fairly good yield of 2750 kg per acre was obtained. (14) A net profit of Rs. 1500/- to 2500/- could be obtained from an acre of IR. 8 paddy.

3) **Discussion & Conclusion:** The usual procedure for introducing an improved strain or a new crop from the Research Station is after a series of trials conducted at the Research Stations for years. Then they are sent to the districts for conducting District Trials in farmers' fields for atleast three seasons or years to find out the suitability to the tract. If they prove successful then they are given the strain numbers and released for the use of farmers. This procedure takes years for a finding or an innovation to permeate to the great majority of farmers.

The 'Feasibility Demonstration' is not to be a substitute for district trial; but whenever a known variety or an agronomical practice is to be taken up with confidence in the Extension Programme the 'Feasibility Demonstrations' have an important role. Unlike district trials the 'Feasibility Demonstrations' are laid in one acre plots. Since a larger number of Demonstrations than the District Trials are laid out and distributed in a wider range, the success and

also the failure points in a crop are obtained in one year itself. A team of Specialists being closely associated with these 'Feasibility Demonstrations' the findings are sifted and effectively utilised for drawing up a package of practices.

The package of practices for the cultivation of IR. 8 paddy and for hybrid maize prepared and now approved by the Tamil Nadu Department of Agriculture is based on these 'Feasibility Demonstrations'.

This technique is particularly commended especially during the present days when technology changes rapidly and we have to move fast to catch up with the progress made in the release of hybrids and high yielding varieties.

While the average yield of paddy in Tamil Nadu in the year 1965-66 was 858 kg per acre, the average yield of IR. 8 paddy at 3560 kg/acre is an overwhelmingly high figure to be compared, indicating that nearly four times the average yield can be obtained by growing IR. 8 paddy.

The acreage planted to IR. 8 even within 2 years of its introduction and immediately after the laying of the 'Feasibility Demonstrations', is on the increase. There is a definite feeling of success and optimism prevailing among the farmers with regard to IR. 8 and this has been due to the 'Feasibility Demonstrations' themselves.

Further, the encouraging results obtained from the 'Feasibility Demonstrations' have given a fillip and confidence to the farmers of the area and the farmers themselves are going in for mass adoption, as could be made out from the observations.

The development of an effective Extension Programme is by itself a sure way to success in rapidly increasing food production. Extension being an educational process involving people actively in all stages of the activities makes them feel that it is their programme—the people's programme. So also, the involvement of the officials of the district, the block, the Specialists of the Agricultural Colleges, and the Administrators of the Extension and Research Programmes, is yet another important aspect which contributes to success of any Extension Programme. It has been found from this study that in these two aspects of the Extension Programme the role of 'Feasibility Demonstrations' has also been a sound and practical help to rapid progress.

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Ionic Composition as a Basis for Assessing the Suitability of Ground Waters for Irrigation

by

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Introduction: When successful sea-water farming is being reported, the old concept of rating the irrigation waters on the basis of total salt concentrations and pH values needs a revision. Salinisation and alkalinisation problems are mainly concerned with the total salt concentration and the sodium ion concentration. The alkali hazard and salinity hazard of irrigation water indicated by S. A. R. limits and E. C. limits prescribed by U. S. D. A. (1954) have been criticised by Hiemann (1958) and Kanwar (1961). Venkatachalam (1958) pointed out that the irrigation waters have to be studied in conjunction with the soil irrigated. It is observed that rather than the mere concentration of individual ions, the balanced ionic environment plays a vital role in soil-plant relationship. Hence, it is essential to revise the code of classifying irrigation waters, so as to have an efficient utilisation.

In the present study, the ionic composition of water along with the irrigated soil is considered for the irrigation waters used in the farms of the Agricultural College, Coimbatore in order to find the suitability of old classifications and also the nature and effect of these waters used in the farms.

Experimental: Thirteen water samples from open wells and borewells of the farms of the Agricultural College, Coimbatore and one sample of Siruvani water were collected and analysed for the following:

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