

superior to other insecticides tried, for control of gallmidge and increasing the rice yield.

Summary and Conclusion: Two trials using synthetic insecticides including granular formulations were carried out at the Regional Agricultural Research Station, Aduthurai during 1968-69 and 1969-70 with a view to find out an effective control of the rice gallmidge *Pachydiplosis oryzae* W. The insecticidal sprays of BHC 0.1%, DDT 0.2%, Endrin 0.04%, Parathion 0.05, Thiometon 0.025%, Carbaryl 0.1% Methyl demeton 0.025% and the granular application of Diazinon, Lindane @ 1.25 Kg ai/ha were compared with untreated control in both the trials. Under severe infestation of 28 to 43%, the application of Diazinon granule thrice @ 1.25 Kg ai/ha at triweekly intervals was found to be very effective for control of the pest and increasing the grain yield.

Acknowledgement: The authors are grateful to the Crop Specialist, Regional Agricultural Research Station, Aduthurai for giving necessary facilities for carrying out the studies.

REFERENCES

- Israel, P. 1956. Insect pests of rice in India and their control. *Int. Rice Commn. News L.* 19:24-31.
- Krishnamoorthy Rao, Krishnamoorthy B. H. and C. Krishnamoorthy. 1960. Insecticidal trials for the control of paddy gallfly. *Andra agrl. J.*, 7:127-36.
- OW, and Kanjanaoon. 1961. A note on the gallmidge resistant rice variety in Thailand. *Int. Rice Commn. News L.* 10:9
- Patel, G. A. and M. V. Bhat. 1954. Insecticidal control of *Pachydiplosis oryzae* W. *Indian J. Ent.*, 16:297-99.
- Patel, G. A., M. V. Bhat and M. A. Gokavi. 1957. Investigation on the Paddy gallmidge *Pachydiplosis oryzae* W. Part I. Annual and seasonal variation of incidence and control. *Indian J. Ent.*, 19:253-67.

<https://doi.org/10.29321/MAJ.10.A03505>

Role of National Demonstrations in Agricultural Technology

by

G. PERUMAL*

Introduction: The important role of both the investigator and the interpreter, in any programme of agricultural development, needs no emphasis. Even if the investigator does his job with thoroughness and perfection, unless these findings are interpreted and conveyed to the farmer, it will only amount to stagnation of his findings. It is also essential that such research findings and improved techniques, be conveyed in a form acceptable to the farmer, if it

* Assistant Lecturer in Agrl. Extension, Tamil Nadu Agricultural University, Coimbatore-3 (Awarded A. H. S. Sharma Rolling Shield for 1970).

should meet with the desired success. Lack of adequate communication media and the low rate of literacy make this job difficult. Herein lies the importance of conducting actual demonstrations in fields, which have a great impact on the cultivators' mind, as they can see with their own eyes, the advantages of adopting improved methods in agricultural technology. Successful demonstration is therefore a powerful tool in the hands of the interpreter—the agricultural extension worker; to carry conviction to the farmers, regarding the advantages of adopting improved techniques and research findings in agricultural technology.

Review of Work: As early as 1903, Seaman Knapp, the father of American Extension Work, demonstrated in the field, how cotton crops could be grown, in spite of damages caused by the cotton boll-weevil. He was of the view that these demonstrations "confirmed that farmers generally would not change their practice from observing what could be done on farms operated at public expense. There, must, therefore, be demonstrations carried on by the farmers themselves on their own farms and under ordinary farm conditions". Since then the concept of demonstrations have undergone several changes, and it is now felt that the effectiveness of demonstrations, as an educational tool, could be enhanced when conducted in cultivator's fields, rather than in the Government farms.

In India the importance of conducting demonstrations was realised in 1928, when the Royal Commission on Agriculture, stressed that "in order that agricultural researches may be of use to the cultivator, their results must be given to him in a form, in which they become part of his practices. In a country where illiteracy is widespread, as it is in India, ocular demonstration is the best method for convincing the cultivating classes, the advantages of agricultural improvement".

The objectives of conducting National Demonstrations are as follows :

- i) to show that high yields of crops could be obtained under farmers' own conditions by adopting improved farm practices.
- ii) to study the factors responsible for higher yields and those causing low yields.
- iii) to minimise the time lag between the research discoveries and their application in the farmers' fields.
- iv) to emphasise the need and feasibility of obtaining high yields through high yielding varieties, for higher production per unit area per unit time.

- v) to serve as a centre of training and education of farmers of the locality.
- vi) to establish direct communication between scientists and farmers.

With the above objects in view, National Demonstrations on major crops, have been conducted in this country in many parts, during the recent past. The data from these demonstrations, were gathered, and an assessment was made to find out how National Demonstrations were utilized as communication media to foster new agricultural technology, by the scientists and the extension workers, for boosting agricultural production.

Results: During 1965-66, National Demonstrations were conducted at various centres, in Tamil Nadu, with important foodcrops, to demonstrate the effect of exploiting the research findings, for obtaining higher yields. Only the research workers were associated with these demonstrations. The yields obtained in monocrop National Demonstrations are presented in Table 1.

TABLE 1. *Yields expressed in Kg./ha. for monocrop National Demonstrations.*

Locality	Crop and strain	Targetted yield	Actual yield obtained
Coimbatore	Ragi Co. 7 (Irrigated)	3,000	5,202
	Cumbu HB. 1 (Irrigated)	1,500	4,375
	Cumbu X. 3 (rainfed)	1,500	2,005
	Paddy Co. 30	4,000	4,708
Ambasamduram	Paddy Co. 25	4,000	4,361
	Paddy ASD. 1	5,000	5,906
Aduthurai	Paddy ADT. 27	5,000	5,503
	Paddy Co. 25	4,000	4,750
Koilpatti	Cumbu X. 3 (Rainfed)	800	919
	Cumbu K. 1 (Rainfed)	800	923

During 1966-67, a slight departure was made in the conduct of the National Demonstrations, by associating the members of the Agricultural Extension Wing also, along with the research workers. The programme was also given a new philosophy by the Indian Council of Agricultural Research and emphasis was shifted from the demonstration of a monocrop to a multicrop. The basic concept was also changed to maximum production per unit area per year, compatible with maximum utilization of fertilizer, water and other inputs. These demonstrations were conducted all over the country, and the yields obtained are given in Table 2.

The data in Table 2 indicate that very high yields could be obtained by conducting National Demonstrations, and that Tamil Nadu has recorded the

highest yields in the multiple, three crop sequence during 1967-68. There is therefore, wide scope for expanding the programme with certain amount of confidence, for achieving increased agricultural production, within a short period.

TABLE 2. *Highest yields obtained in multiple crop National Demonstrations conducted during 1967-68.*

Crop rotation	State	District	Yield Quintals/ha
Paddy, Paddy, Maize	Tamil Nadu	Thanjavur	180.3
Paddy, Maize	Mysore	Bangalore	173.1
Paddy, Paddy	Andhra Pradesh	West Godavari	169.5
Paddy, Wheat	Delhi	Delhi	158.8
Bajra, Wheat	Punjab	Sangrur	150.1
Paddy, Maize and Maize	Andhra Pradesh	West Godavari	146.3
Maize, Wheat	Haryana	Rohtak	145.8

The progress of work under the various National Demonstrations was reviewed during the All India Workshop held during 1969 and it was recommended that the National Demonstrations should also focus on points for the Farmers' Training Programmes, and the progressive farmers and lay leaders should also be involved in all the operations of the National Demonstrations. Besides this, timely information should be conveyed through the radios, as well as by direct approach by the Agricultural Extension Workers. It was further suggested during the Workshop, that National Demonstrations should be organised for rainfed crops also so as to include suitable High Yielding Varieties with suitable package of practices, evolved by the research workers.

As a consequence of the above recommendation, 65 National Demonstration plots were assigned in Tamil Nadu during 1968-69. Out of this 39 plots were under the three-crops and 26 under the two-crops sequence. Forty-five out of the sixty-five demonstrations were allotted to the Extension agencies and 20 to the Research agencies. The layout of the National Demonstration plots were assigned to the Crop Specialists and Research Officers on the Research side, and to the District Agricultural Officers on the Extension side, with the Joint Director of Agriculture (Extension) as the State Co-ordinator.

The demonstrations were laid out in representative areas all over Tamil Nadu at Madras, Thanjavur, Madurai, Tiruchirapalli, Coimbatore and Tirunelveli. In the two crop sequence the main crop was paddy and the second crop was either cumbu or maize. The three-crop sequence demonstrations included paddy, cumbu, ragi, maize, groundnut and cotton.

The highest grain yields obtained through these demonstrations are given in Table 3 below.

TABLE 3. *Yields of grain obtained through National Demonstrations conducted during 1968-69*

Crop and strain	Total No. of Demonstrations in two crop and three crop sequence	Targetted yield in kg/ha	Highest yield recorded in kg/ha
<i>Paddy</i>			
ADT. 27	42	5,000	6,247
IR. 8	30	5,000	11,230
IR. 5	6	5,000	7,442
CO. 25	19	4,500	6,314
CO. 32	8	4,000	4,032
CO. 29	6	4,000	6,239
ASD. 11	1	4,000	4,555
ASD. 5	3	4,000	3,432
<i>Millets</i>			
CSH 1 (Cholam)	3	4,000	5,298
HB 1 (Cumbu)	4	4,000	5,187
CO 7 (Ragi)	7	4,000	4,557
Deccan Maize	13	4,000	5,982
<i>Others</i>			
TMV 2 (Groundnut)	3	3,000	3,626
PRS 72 (Cotton)	1	2,000	2,025
Wheat	2	—	3,735
ADT Bengal gram	2	—	500

It is seen that in most of the cases, the yields obtained, far exceeded the targetted yields. These results, when conveyed to farmers are bound to create confidence to the farmers as well as the research and extension workers.

Discussion: The following are some of the important factors that contribute for the success of National Demonstrations as a communication medium are discussed under.

Selection of farmers and the fields for conduct of demonstrations: The selection of the right type of farmer is one of the foremost factors in the conduct of the demonstrations. The personal characters of the farmer like

willingness to co-operate, interest in the work, ability to understand and execute instructions, educational background, and resourcefulness have to be considered before selecting the farmer. In this selection the Extension Personnel should bestow utmost care, since they know the progressive farmer or functional leader of the locality, where the National Demonstrations is to be organised (Singh, 1968). Selection of fields for conduct of National Demonstrations, is next in importance. The site should be suitable and located in a suitable place, with adequate irrigation facilities. This work could be entrusted to the Specialists in charge of the programme. Thus, organising and communicating the techniques of improved methods of cultivation of crops through National Demonstrations must be purely a team oriented work.

Selection of crop sequence: Maintaining the fertility of the land, should be the primary concern while selecting the crop sequence. One of the crops should preferably be a deep rooted one, and the other, with more shallow roots, so that the different layers of the soil, could be tapped for better nutrients by the different crops. Swaminathan (1970) has suggested that 'for each agro-climatic area, multiple cropping cafeteria with a wide choice of an appropriate combination suited to the farmers' needs and input mobilising potential, and the demands of the market should be evolved. The local practices adopted by the farmers should be taken into consideration, and modifications, if any, required, incorporated, at this stage. Importance should also be given by the organising staff, to consult the farmers before fixing the crop sequence.

Table 4 and 5 given below, indicate the nature of the crops selected under the two-crop and three-crop sequence, under the National Demonstrations, conducted in Tamil Nadu during 1968-69.

TABLE 4. *Details of crops selected for the two-crop sequence in the National Demonstrations during 1968-69*

Crop Sequence	Regions						
	Madras	Thanjavur	Madurai	Tiruchy	Coimbatore	Tirunelveli	
Paddy, Paddy	1	6	4	—	5	5	21
Paddy, HB 1 cumbu	—	—	—	—	—	1	1
Paddy, Deccan Maize	—	2	—	—	—	—	2
Total	1	8	4	—	5	6	24

TABLE 5. *Details of crops selected for the three-crop sequence in the National Demonstrations during 1968-69*

Crop sequence	Regions						
	Madras	Thanjavur	Madurai	Tiruchy	Coimbatore	Tirunelveli	
Paddy, Paddy, Paddy	6	—	—	—	2	—	8
Paddy, Paddy, HB 1 cumbu	—	—	—	2	1	—	3
Paddy, Paddy, Ragi CO 7	—	—	—	1	—	—	1
Paddy, Paddy, Maize	—	5	—	2	1	—	8
Paddy, Paddy, TMV 2 Groundnut	2	—	—	—	—	—	2
Paddy, Paddy, PRS 72 Cotton	—	1	—	—	—	—	1
Paddy, Ragi CO 7, TMV 2 Groundnut	—	—	—	1	—	—	1
CSH 1, Ragi CO 7, Maize	—	—	—	—	2	—	2
CSH 1, Ragi CO 7, Wheat	—	—	—	—	1	—	1
Ragi, Deccan Maize, Wheat	—	—	—	—	1	—	1
Total	8	6	—	6	8	—	28

It is seen from the Tables 4 and 5 that deep-rooted crops like cotton have not been included wherever possible and feasible. Enough attention should be given, in the demonstrations to be conducted in future, for inclusion of cotton and pulses also in the crop sequence, so that the nutrients at the different soil layers, could be fully tapped with advantage.

Soil analysis: A knowledge of the nutrient status of the soil before and after conducting the National Demonstrations is essential. Hence the team organising the demonstrations, should involve the farmers also in the collection of soil samples. The techniques involved in the collection of soil samples could be communicated to the neighbouring farmers also through farmers' training camps. Wide publicity can also be given through various media, and the recommendations of the soil testing laboratories, should be adopted, for getting better results.

Cultivation of crops: At this stage, the responsibility of the organising team is more onerous. The staff associated with the programme should necessarily adopt all the recommended practices, at the appropriate time, operations like raising the nursery, or dibbling seeds, preparation of main field, manuring both basal and top dressing, irrigation, after cultivation care, plant protection measures, and harvesting, should all be carried out very carefully, in the presence of the farmers. Each and every step in the operations, should

be conveyed to the farmers in an understandable and acceptable way. At every stage, opportunities for the farmers, to do the operations, themselves, should be created. It would be a wise step, if Farmers Training Camps are organised with farmers of the locality, and also to make attempts to educate them about the new practices adopted in the National Demonstration plots.

Harvesting and recording data: It is an accepted fact that successful demonstrations invariably lead to adoption of the new methods and techniques besides bringing about a change in the attitudes and knowledge of the farmers. Conviction among the farmers will emerge from the results produced in his own farm or near his farm. The entire plot of one acre should be accurately marked, harvested and the entire harvested produce threshed on the same day. Steps should also be taken to complete all the operations of harvesting and recording the data the very same day as far as possible to avoid any suspicion in the minds of the neighbouring farmers.

Arranging field days and field trips: Organising field days and visits for individuals or groups of farmers during the various stages of the crop are very important for better and effective communication and to bring conviction among the farmers. These trips and visits can definitely establish better communication between scientists and farmers. Ample opportunities should also be provided to discuss the weak points in the demonstration as well as factors responsible for high yields.

The National Demonstration farmer should be engaged to give a special talk about all the aspects of the demonstration and the benefits could be obtained through the National Demonstration. This affords an opportunity to the neighbouring farmers to hear the voice of the fellow farmer. The voice of the farmer demonstrator will carry more conviction than that of the officers.

Conclusion: The National Demonstrations Programme ensures participation of the enthusiastic farmers and familiarises them with latest techniques for increased production.

It confronts the scientists with the problem which prevented the realisation of the full potential of the varieties.

Secondly, it helps to remove the common belief that scientists usually obtain high yields on small plots at their experimental stations only, since such high yields were obtained through the necessary techniques or practices demonstrated on hundreds of farmers' fields also ranging from one acre to one hectare in extent.

Even the failures or below average performance may be of educative value to prevent further lapses in the successful conduct of the National Demonstration Plots.

Finally, the stature and morale of the farmer is elevated. They are oriented towards application of technology in the field of agriculture and the stage is set for a real revolution in agriculture, viz., "Green Revolution".

In the words of Kanwar, "truly speaking, National Demonstration is a national movement for freedom from want and hunger. It shows that India can produce enough food for her teeming millions and spare enough for export to other countries". National Demonstrations as important communication medium to foster new agricultural technology in Indian agriculture has great potentialities.

REFERENCES

- Kanwar, J. S. 1969. Seeing is Believing. "National Demonstrations" are Exhibition of Potentiality. *Krishak Samachar*. A-1, Nizamuddin West, N. Delhi-13. Vol. 13
- Kelsey, L. D. and C. C. Hearne. 1955. *Co-operative Extension Work*. Comstock Publishing Associates - New York, p. 18.
- Mundra, S. N. 1970. Farmers education through National Demonstrations. *Rural India*, Ishwardas Mansions Nana Chowk, Bombay-7, Vol. XXXIII, No. 3, March.
- Royal Commission on Agriculture in India. 1928. *Demonstration and Propaganda*. Abridged Report. Bombay - Chap. IV.
- Swaminathan, M. S. 1970. Concept of crop planning. *Indian Farming*. Indian Council of Agricultural Research, New Delhi-1, Vol. XX, No. 3, June, 41-42.
- . 1966. Circular on National Demonstrations. Office of the Director of Agriculture, Madras-5.
- . 1968. Proceedings of the All India Workshop on National Demonstrations Project held at Indian Agricultural Research Institute, New Delhi.
- . 1969. All India Workshop on National Demonstrations held at New Delhi.
- . 1970. Consolidated Report of Deputy Director of Agriculture (Extension) on National Demonstration Plots of Tamil Nadu.