National demonstrations and the new agricultural strategy

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Recent achievements in stepping up greatly the genetic potential for yield through the exploitation of hybrid vigour in Jowar, bajra, maize and fodder grasses and the introduction of a dwarf and non-lodging plant habit in wheat and rice have opened up new possibilities in food and fodder production in India. The yields obtained during 1965 in a 10 acre seed multiplication plot of the Division of Botany, Indian Agricultural Research Institute, New Delhi, are given below:

Rabi 1964-65		Kharif 1965		Total grain yield Q/Ha.
Wheat variety	Yield Q/Ha	Crop	Yield Q/Ha	
Sonora 64	65.6	Maize-Ganga 3	57.4	123.0
Sonora 63	60.0	Maize-Composite	50.5	110.5
Lerma Rojo	55.3	Jowar-CSH-1	50.0	105.3
N.P.876	48.8	Jowar-CSH-2	55.0	103.8
N.P.880	45.9	Bajra-H...1	48.3	94.2

The field in which this yield was obtained is somewhat alkaline and no technique was adopted which cannot be practised by an average farmer with irrigation facilities. However, because of the sights as regards the yield potential of our crops having been pitched verylow, even learned persons have remarked that "all this is surely staggering. It is nothing short of a miracle" and "the average yield rates of 6 tons per hectare of wheat that are sometimes quoted in this regard are fanciful". Since the only feasible way of bridging the gap between demand and supply in our national food budget within the next few years is the maximisation of production in irrigated lands, the new strategy of agriculture has laid stress on the cultivation in 32 million acres of irrigated land the

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new hybrids of maize, jowar and bajra and dwarf varieties of wheat and rice in conjunction with suitable fertilizer and crop management practices. In order to teach both extension workers and farmers that the yields obtained in experimental fields are not caused by a miracle but are within the easy reach of all farmers who wish to work for them, a programme of national demonstrations was initiated by the Union Ministry of Agriculture during 1965 at the instance of the Panel of Scientists attached to the Ministry. Inthe words of the Union Minister for Food & Agriculture, the rationale behind this programme is as follows:

Background of the programme:

"Unless scientists can demonstrate what they advocate their advice may not be heeded. Since they have not had much opportunity to do this in the past, we are initiating during this year a 'National Agricultural Research and Development Year Programme', an important part of which will be to stud the country with excellent demonstration plots showing the yields that can be easily obtained in all our major crop plants, provided the available scientific know-how is put to use. These demonstrations will be laid out in farmer's fields by the Staff and students of all our agricultural institutions and colleges. They will thus help in dispelling the views expressed on the one hand by some politicians and administrators that our scientists have little contacts with the farming community and on the other, by our senior scientists that what is applied research of great value is constantly converted into 'ivory tower' research in our country by not making proper arrangements to exploit the research findings'.

Aims of the National Demonstration Programme:

1) To provide an opportunity to scientists and students of Agricultural Institutions to demonstrate convincingly that very high yield levels can be reached in our major crop plants by exploiting the results of the research work carried out in the country. The demonstrations should hence be such that the crops raised are the best that the farmers of the locality have so far seen. These demonstrations should serve as windows into the world of plenty and prosperity that awaits our farming community.

2) To identify the factor(s) limiting crop yields inthe different parts of the country.

Action plan:

The detailed action plan is worked out by the institutions which undertake to lay out the demonstration. All the scientists of the concerned institution as well as the students (In the case of educational institutions) jointly participate in the programme. This helps to generate the degree of enthusiasm and effort which is essential for achieving high yields. The demonstration plot at the Jounti village in Delhi State was laid out jointly by the staff

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and students of the Botany Division of IARI on November 14, 1964 & 1965 as homage to the memory of the late Shri Jawaharlal Nehru. This gave an enormous psychological impetus to the whole programme, since every one wanted to do something of which the departed leader would have been proud.

No demonstration is laid out in a routine way, without any chance of achieving a spectacular rise in yield:

Scientists and students consider these demonstrations a challenge to their prestige and ability and they work in such a way that the demonstration plots raised by them become the principal talking point of the farming community of that area.

Review of National Demonstrations Kharif 1965-66.

According to the programme of demonstrations planned in the meeting held at the Indian Agricultural Research Institute, New Delhi, on 14th and 15th April, 1965, the number of national demonstrations to be established in the different crops in 1965-66 was as follows:

Rice	153
Maize	69
Jowar	74
Bajra	75
Ragi	10

Officers of the Directorate of Extension on their visits to the different States saw a number of these demonstrations. From the observations made by them it would appear that the demonstrations were, in a very large majority of cases, successful in that the crop looked better than what most of the farmers had ever seen before. Reports received show that field days were organised to help farmers see the demonstrations. A considerable interest and excitment among them was evident at the excellent performance of the crops grown. The reaction of many of them could perhaps be illustrated by what one of them, Shri Saini of village Partala (Distt. Chhindwara, M.P.) said "what a wonder this hybrid maize will do. It will surely benefit cultivators to improve their livelihood together with fulfilling the nation's dream of becoming self-sufficient in food" he said. The interest taken by the workers is commendable. Where the crop had suffered on account of the unusually poor monsoon season the farmers appeared to be prepared to make an

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allowance for the adverse conditions in judging the performance of the crop in the demonstration. From all counts it appears that the demonstrations have served the very useful purpose for which they had been suggested, namely that of informing the farmers that very high yields can be produced with the use of available knowledge and technology in crop production and that this knowledge could be profitably employed by the farmers. Many of the farmers appeared to have made up their minds that they would adopt the use of the practices demonstrated, including hybrid seed of maize, Jowar and Bajra.

Economics of the production and profit were worked out only in the case of few demonstrations. The available figures are given in the table below:

TABLE

Yield and net profit from crops grown in demonstrations.

State	Location	Crop	Variety	Yield (Kg/ha)	Net profit (Rs./ha)
Bihar	Monghyr	Rice	BR 34	3963	1450
"	Deoghar	"	"	5461	2405
"	Bhagalpur	Maize	Ganga Safed 2	5945	3025
"	Monghyr	"	Ganga 101	3953	1691
U.P.	Rudrapur	"	"	5583	2372
"	"	"	Ganga Safed 2	6192	2675
"	"	"	"	5657	2497
"	"	"	Ganga Safed 3	3631	1483
"	"	"	Ganga Safed 2	5026	2164
"	Pisuli	Maize	Ganga Safed 3	3730	777
"	"	"	" "	3848	850
Gujarat	Panchmahals	Bajra	Hyb.115	2480	1892
U.P.	Baseuli	"	H.B.1.	4113	1221
"	"	"	"	4295	1320

The profits, per hectare, vary considerably as is evident from the above table, ranging from Rs.777 to Rs.3,025 per hectare. When average profits are worked out, the figures are Rs.1,927 for rice, Rs.1,837 for maize and Rs.1,478 for bajra.

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Programme of demonstrations for 1966.

This year, about 1000 demonstrations with an yield target of 6 tons per hectare are being arranged in rice to commemorate the International Rice Year sponsored by the F.A.O. In addition, a total of 1000 demonstrations will be organised in wheat, jowar, maize and bajra. The response from scientists for organising these demonstrations has been most encouraging.

Field Days.

Since the purpose of the demonstrations is to raise the sights of farmers with regard to the yield potential of crops, as many farmers as possible are encouraged to visit the demonstrations. In the Delhi State, the following national demonstrations with dwarf wheats are currently getting ready for harvest.

Village	Block	Name of farmers
Paprawat	Najafgarh	Shri Roshan Lal.
Jounti	Kanhawala	Shri Govardhan Lal.
Punjab Khor	"	Shri Mohinder Pal Singh.
Chattarpur	Mehrauli	D.L.F. Farm.
Mukhmel Pur	Alipore	Shri Hira Singh.

The Field Day programme is as follows:

Date	Place
March 15,66.	Jounti, Kanjhawala Block.
March 17,66.	Paprawat, Najafgarh.
March 22,66.	Alipore.
March 6,66.	Pusa Institute.

World record for wheat yield.

The present world record for commercial wheat yield is held by Elmer Yoshino, a farmer of Washington State, United States who harvested in 1965 from a 27-acre plot an average yield of 169.9 bushels per acre (i.e., about 10,700 lbs/ acre). Another farmer in the same area, Otis Nelsley, harvested 168.8 bushels per acre in a 26-acre field. The variety used was Gaines, which like Sonora 64 is a dwarf wheat. The total fertilizer dose applied was 220 lbs nitrogen per acre.

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Wheat yields in Mexico.

The average yield of wheat in Mexico during the past two decades is given below:

Year	Yield (Kg/ha)
1945	750
1950	900
1955	1100
1960	1417
1964	2600

The extremely high yield potential of the semi-dwarf and dwarf bread wheat varieties released for cultivation during the last three years is responsible for the dramatic rise in average yield. These varieties occupied 95% of the area (546000 hectares) sown to wheat during 1964.

Wheat production problems:

a) Rusts: During the last 20 years, six different stem rust changes have occurred in Mexico. Despite these changes stem rust has been kept under control by opportune replacement of varieties. The average commercial lifetime of an improved variety has been only 4 years, with the exception of one variety, Lerma Rojo, which lasted for 9 years. Thus, a rapid seed multiplication programme is a must for sustaining high levels of yield.

b) Soil fertility research: In Mexico, once the soil fertility research information was developed, it became possible to change rapidly wheat yields under irrigation. In the "worn-out" black soils of the Bajio region which has been double cropped since about 1580 with maize during the summer and wheat during winter, yields increased from 450 lbs to 5000 lbs per acre with the application of 140-160 lbs nitrogen per acre combined with modification of irrigation practices and the use of dwarf wheats.

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