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The bulk-line cost to cover 85 per cent of total production of different crops has been estimated in Table XI.

TABLE XI—BULK-LINE COST OF DIFFERENT CROPS (GRAIN ONLY)

Crops	Bulk-line cost (Rs.)	Per cent coverage of		
		Farms	Area	Production
Wheat H.Y.	37.75	82.25	84.50	85.00
Wheat local	58.25	85.00	78.00	85.00
Maize H.Y.	34.50	78.00	69.00	85.00
Maize local	51.25	81.00	83.00	85.00
Bajra H.Y.	32.50	82.00	77.50	85.00
Bajra local	50.00	81.00	82.00	85.00

The bulk-line cost of high-yielding grain for all crops was much lower than that of the local varieties. The cost per quintal of high-yielding wheat variety was Rs. 37.75 covering 82.25 per cent farms and 84.50 per cent area under the crop. For wheat local 85 per cent production was obtained at Rs. 58.25 per quintal. An important conclusion from the above table may be drawn that there was not much difference in the cost of wheat, maize and bajra. This may not generally hold true because the decline in the yield of maize and bajra due to excessive rainfall in the area was responsible for an increase in the cost per quintal.

SOME ECONOMIC ASPECTS OF HIGH-YIELDING VARIETIES PROGRAMME OF INDORE DISTRICT

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The paper attempts to (*i*) find out the levels of inputs and output in the production of local and Mexican wheats; (*ii*) to study the extent to which recommended practices were adopted; (*iii*) to work out the input needs at the farm, village and district level and (*iv*) to define the problems which hinder the extension of new varieties.

Methodology

Out of 665 villages in the district, Nenod village was selected for the study and the study is confined only to wheat crop taken during 1967-68, because the

* The views expressed by the author are personal and the study was conducted in his personal capacity.

crop has achieved tremendous success in the High-Yielding Varieties Programme (HYVP) in the district. The village selected has been declared first in high-yielding wheat production programme in the district by the Department of Agriculture, Madhya Pradesh.

All the cultivating families of the village were listed. Then the families cultivating wheat were divided into two groups, first, those who have participated in the HYVP of wheat and another, those who have not participated. The families in each of the group were arranged in descending order according to the size of the cultivated holding and were further divided into five equal sub-groups. Out of these five sub-groups, only three families were selected at random from each of the sub-groups of the participating and non-participating families. The entire study thus covers 15 participating and 15 non-participating families, totalling 30 holdings in the village. For making the study more purposeful the two different types of families have been named as "participant" and "non-participant farms."

The New Strategy in the District

In the district, the HYVP was started from *kharif* season of 1966 and maize, jowar and wheat crops were taken in the programme. The targets fixed in the initial year to cover hybrids of jowar, maize and wheat were of the order of 809 hectares, 607 hectares and 405 hectares respectively. During this year, the achievements against the targets were highest for wheat crop being 24 per cent, jowar 4.40 per cent and maize 1.86 per cent. In the second year of the HYVP, the targets were fixed to cover 1,214 hectares under jowar, 809 hectares for maize and 607 hectares under wheat and in this year also, the coverage of wheat against its target was quite satisfactory being 68.28 per cent, whereas the achievements of jowar and maize were 3.40 per cent and 2 per cent only. For the year 1968-69, the targets have been fixed at 2,428 hectares, 607 hectares and 1,214 hectares for jowar, wheat and maize respectively, indicating an increase in the targeted areas by three times, one and half times and two times respectively over the initial year.[1]

The Village and the HYVP of Wheat

Nenod village is situated on Indore-Depalpur road and is 11 kilometres from Indore City. About 85 per cent of the total village area is put under cultivation. Of the total cropped area of 582.36 hectares, 171.69 hectares (29.48 per cent) are devoted to *kharif* crops and 410.61 hectares (70.52 per cent) for *rabi* crops.[2] The soil is generally black and heavy and *Mot* is the chief device of irrigation, irrigating an area of 7.87 per cent of the total cropped area. The most important crops of the village are wheat, gram, jowar, *tur* and linseed, having an area of 239.10 hectares (41.07 per cent), 136.53 hectares (23.45 per cent), 75.91 hectares (13.04 per cent), 26.44 hectares (4.54 per cent) and 22.56 hectares (3.87 per cent) respectively. More than 91 per cent of the cropped area is under food crops and about 87 per cent is put under foodgrain crops, indicating clearly foodgrains-oriented cropping pattern in the village.

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1. *Source :* Office of the Joint Director of Agriculture, Indore.
2. *Source :* Patwari records of Nenod Village.

Out of 72 cultivating families in the village, 29 families (40 per cent) have participated in the HYVP of wheat during 1967-68 and the total area under Mexican wheats was 18.51 hectares which constituted about 8 per cent of the total area sown under wheat in the village.

SIZE OF HOLDINGS, IRRIGATED AREA AND CROPPING PATTERN ON THE TWO SETS OF FARMS

An analysis of the data revealed that the participant farms are more superior than the non-participant farms in respect of size of holdings, irrigated area and cropping pattern. The participant farms are carried on some commercial lines. The average size of participant farms is 9.72 hectares, while for the non-participant farms it is 7.22 hectares, the former are larger by 2.50 hectares than the latter.

TABLE I—SIZE AND OWNERSHIP OF FARMS OF PARTICIPANT AND NON-PARTICIPANT FARMS

(in hectares)

Type of ownership	Participant farms			Non-participant farms		
	Total area	Average size	Percentage	Total area	Average size	Percentage
Owned	140.50	9.36	96.33	98.62	6.57	90.98
Leased	5.35	0.36	3.67	9.77	0.65	9.02
Total	145.85	9.72	100.00	108.39	7.22	100.00

It is also noted that the participant farms have not only about one and half times larger area than the non-participant ones, they also have about six times more area under irrigation (Table II). Moreover, it has also been observed that the area under double crops and current fallows is just double on the participant farms as compared to the non-participant farms.

TABLE II—IRRIGATED AREA ON PARTICIPANT AND NON-PARTICIPANT FARMS

(in hectares)

Particulars	Participant farms			Non-participant farms		
	Total area	Average size	Percentage	Total area	Average size	Percentage
Irrigated area	18.63	1.24	12.78	3.55	0.24	3.28
Unirrigated area	127.22	8.48	87.22	104.84	6.98	96.72
Total	145.85	9.72	100.00	108.39	7.22	100.00

A close perusal of Table III reveals that the increase in the cropped area of the participant farms has been of the order of 12.29 per cent in 1967-68 and 20.82 per cent in the crop plan of 1968-69 over 1966-67 as against 16.33 per cent and 24.42 per cent on the non-participant farms during the same period. Again, for both the groups, wheat, gram and jowar are the major crops accounting for approximately 80 per cent of the cropped area. Here we also see that the participant farms devote much area for wheat crop as compared to the non-participant ones and on the non-participant farms jowar has much larger area than the participant farms.

TABLE III—CROPPING PATTERN ON PARTICIPANT AND NON-PARTICIPANT FARMS

(*in hectares*)

Crops	Participant farms			Non-participant farms		
	1966-67	1967-68	1968-69 (crop plan)	1966-67	1967-68	1968-69 (crop plan)
	Area	Area	Area	Area	Area	Area
1. Jowar	30.53 (25.21)	17.81 (13.09)	20.42 (15.30)	23.36 (29.78)	25.68 (28.14)	26.72 (27.38)
(*a*) Local	30.53 (25.21)	14.12 (10.38)	12.42 (8.91)	— (—)	— (—)	— (—)
(*b*) Hybrid	— (—)	3.69 (2.71)	8.00 (6.39)	— (—)	— (—)	— (—)
2. Maize	2.45 (2.02)	1.61 (1.18)	3.64 (2.61)	1.79 (2.28)	1.50 (1.65)	2.09 (2.16)
(*a*) Local	2.05 (1.69)	1.21 (0.88)	— (—)	— (—)	— (—)	— (—)
(*b*) Hybrid	0.40 (0.33)	0.40 (0.30)	3.64 (2.61)	— (—)	— (—)	— (—)
3. Wheat	41.43 (34.21)	59.73 (43.93)	65.77 (47.20)	24.42 (31.34)	29.56 (32.39)	32.36 (33.37)
(*a*) Local	40.22 (33.21)	49.44 (36.35)	52.10 (35.61)	— (—)	— (—)	— (—)
(*b*) Mexican	1.21 (1.00)	10.29 (8.26)	13.67 (9.81)	— (—)	— (—)	— (—)
4. Gram	21.82 (18.01)	28.63 (21.05)	30.58 (21.94)	15.43 (19.67)	16.17 (17.73)	18.40 (18.85)
5. *Tur*	6.04 (4.98)	2.35 (1.75)	2.40 (1.72)	3.95 (5.09)	4.24 (4.64)	3.95 (4.04)
6. Sugarcane	— (—)	0.25 (0.18)	1.42 (1.01)	— (—)	0.40 (0.43)	0.40 (0.41)
7. All vegetables	5.68 (4.69)	5.15 (3.78)	5.74 (4.11)	0.73 (0.93)	0.66 (0.72)	0.54 (0.55)
8. Condiments and spices	1.06 (0.87)	3.50 (2.58)	1.45 (1.04)	3.34 (4.25)	0.36 (0.39)	0.30 (0.31)
9. Total fruits	2.20 (1.82)	2.61 (1.92)	2.61 (1.87)	— (—)	— (—)	— (—)
10. Cotton	3.09 (2.55)	2.34 (1.72)	1.89 (1.35)	2.36 (3.00)	1.54 (1.68)	1.32 (1.37)
11. Linseed	0.80 (0.71)	7.51 (5.52)	0.25 (0.17)	2.42 (3.08)	6.59 (7.22)	5.46 (5.59)
12. Groundnut	3.23 (2.66)	1.52 (1.11)	1.00 (0.71)	0.04 (0.05)	0.12 (0.13)	1.25 (1.28)
13. Others	2.76 (2.27)	2.97 (2.19)	2.17 (1.55)	0.58 (0.73)	4.42 (4.88)	4.58 (4.69)
Total cropped area	121.09 (100.00)	135.98(100.00)	139.34(100.00)	78.42(100.00)	91.24(100.00)	97.57(100.00)

N.B. : Figures in parenthesis are percentages to total cropped area.

From Table III, the impact of the HYVP on cropping pattern can also be examined. It appears clearly that on the participant farms, the percentage area under local varieties of wheat, jowar and maize has gone down from 36.35 in 1967-68 to 35.61 in 1968-69 in wheat, from 25.21 in 1966-67 to 8.91 in 1968-69 in jowar and from 1.69 in 1966-67 to zero per cent in 1968-69 for maize crop. Another change of some significance on the participant farms is the shifting over of the area under *kharif* crops to *rabi* crops. From 43 per cent of *kharif* area in 1966-67, it has declined to the level of 25 per cent in 1967-68 and 27 per cent in 1968-69. From this it appears that farmers have converted some area under *kharif* crops into *rabi* crops. As may be seen from Table III, the proportion of area under jowar has declined from 25.21 per cent to 15.30 per cent, *tur* from 4.98 per cent to 1.72 per cent, cotton from 2.55 per cent to 1.35 per cent and groundnut from 2.66 to 0.71 per cent during the crop plan of 1968-69 over 1966-67. Apparently, the area under these crops has been switched over to more remunerative crops like Mexican wheats.

Break-up of Mexican Wheats on Participant Farms

In the initial year of the HYVP, Sonora 64 and Lerma Rojo varieties of wheat were sown on the participant farms in an area of 0.81 hectare and 0.40 hectare respectively but in the second year, the coverage of the area under these varieties increased by 10 times and in the next *rabi* season it is expected to go up by 13 times over the initial year as is given in Table IV.

TABLE IV—AREA UNDER DIFFERENT VARIETIES OF WHEAT ON PARTICIPANT FARMS

(*in hectares*)

Variety	1966-67		1967-68		1968-69 (crop plan)	
	Area	Percentge	Area	Percentage	Area	Percentage
1. Sonora 64 ..	0.81	66.94	5.94	57.72	6.59	48.22
2. Lerma Rojo ..	0.40	33.06	2.96	28.76	2.33	17.04
3. S 227 ..	—	—	1.39	13.52	3.82	27.94
4. Hybrid 65 ..	—	—	—	—	0.93	6.80
Total	1.21	100.00	10.29	100.00	13.67	100.00

It can also be observed from the table that during the crop plan of 1968-69, the importance of wheat varieties of Sonora 64 and Lerma Rojo has declined from the previous years and the cultivators have been attracted much more towards S 227 variety. This shift in importance to S 227 is mainly due to its high yield potentiality than Sonora 64 and Lerma Rojo.

CURRENT FARM EXPENDITURE

The current farm expenditure includes the expenses for the payment of labour, land revenue, irrigation charges, bullock labour charges and for the purchase of

inputs like seed, fertilizer and pesticides. The average current farm expenditure per hectare (Table V) for raising Mexican wheats on the participant farms has been found to be Rs. 1,660.53 while it is Rs. 491.11 per hectare on the non-participant farms. Thus our study tends to indicate that more than three times expenditure is incurred in raising Mexican wheats over the local ones.

TABLE V—CASH AND KIND EXPENDITURE ON THE SELECTED FARMS

(in percentages)

Particulars	Participant farms				Non-participant farms	All farms
	Sonora 64	Lerma Rojo	S 227	Local	Local	
Cash expenditure ..	26.15	26.79	27.45	9.81	9.54	24.07
Kind expenditure ..	73.85	73.21	72.55	90.19	90.46	75.93
Total current farm expenditure ..	100.00	100.00	100.00	100.00	100.00	100.00

Table V reveals that while cash expenditure on the participant farms is about 26 per cent of the total farm expenditure, it is only about 10 per cent on the non-participant farms. The ratio between cash and kind expenditure on all farms have been 24:76.

Distribution of Current Farm Expenditure into Different Inputs

On the participant farms, manures and fertilizers alone accounted for 49.12 per cent of the total farm expenditure followed by irrigation charges (18.45 per cent), hired human labour (12.28 per cent), bullock labour (10.33 per cent) and seed (8.26 per cent). On the non-participant farms, human labour is the most important item of expenditure accounting for 31.52 per cent of the total expenditure, and bullock labour (28.72 per cent), manure (21.82 per cent) and seed (16.89 per cent) are next to hired human labour in importance.

It can also be seen from Table VI that the additional expenditure per hectare in raising Mexican wheats is Rs. 1,169.42 and the additional outlay on hired labour, fertilizers and pesticides, and irrigation is of the order of Rs. 49.04, Rs. 487.19, and Rs. 306.52 per hectare respectively on the participant farms as compared to the current scale of expenditure by the non-participant farms.

THE YIELD POTENTIAL

The yield potential of S 227 has been found to be highest among the three distinct types of Mexican wheats. The average yield of S 227 is 36.05 quintals per hectare. The performance of Lerma Rojo has been second being 24.02 quintals per hectare with a range between 16.42 to 30.10 quintals per hectare.

TABLE VI—DISTRIBUTION OF CURRENT FARM EXPENDITURE PER HECTARE ON SELECTED FARMS

(in Rs. per hectare)

Item of expenditure	Participant farms										Non-participant farms		Additional expenditure over local wheats
	Sonora 64		Lerma Rojo		S 227		Average of Mexican wheats		Local wheats		Local wheats		
	Expenditure		Expenditure		Expenditure		Expenditure		Expenditure		Expenditure		
1. Human labour													
Casual													
Cash	23.10	(1.44)	26.51	(1.66)	22.12	(1.57)	25.91	(1.57)	16.35	(3.34)	23.46	(4.72)	2.45
Kind	150.87	(9.43)	137.14	(8.59)	142.55	(7.98)	143.52	(8.65)	102.84	(22.26)	113.15	(23.03)	30.37
Total ..	173.97	(10.87)	163.65	(10.25)	170.67	(9.55)	169.43	(10.22)	119.19	(25.80)	136.61	(27.81)	32.82
Permanent labour													
Cash	35.47	(2.22)	24.28	(1.52)	43.56	(2.43)	34.43	(2.07)	23.03	(4.99)	18.21	(3.78)	16.22
Kind	—	(—)	—	(—)	—	(—)	—	(—)	—	(—)	—	(—)	—
Total ..	35.47	(2.22)	24.28	(2.52)	43.56	(2.43)	34.43	(2.07)	23.03	(4.99)	28.21	(3.78)	16.22
Total human labour ..	209.94	(13.09)	187.93	(11.77)	214.23	(11.98)	203.86	(12.28)	142.22	(30.79)	154.82	(31.52)	49.04
2. Total bullock labour ..	173.12	(10.82)	161.44	(10.11)	180.00	(10.08)	171.52	(10.33)	135.91	(29.42)	141.07	(28.72)	30.45
3. Seed													
Farm produced	—	(—)	—	(—)	—	(—)	—	(—)	79.07	(17.11)	82.94	(16.69)	54.06
Purchased	122.00	(7.63)	134.00	(8.39)	155.00	(8.69)	137.00	(8.26)	—	(—)	—	(—)	
Total ..	122.00	(7.63)	134.00	(8.39)	155.00	(8.79)	137.00	(8.26)	79.07	(17.11)	82.94	(16.69)	54.06
4. Farmyard manure ..	335.14	(20.96)	323.71	(20.26)	384.24	(21.53)	347.69	(20.94)	98.84	(21.40)	107.14	(21.82)	240.55
5. Fertilizers	448.50	(28.04)	463.54	(29.03)	492.00	(27.56)	468.01	(28.18)	—	(—)	—	(—)	468.01
6. Insecticides	18.50	(1.15)	20.16	(1.27)	18.90	(1.06)	19.18	(1.15)	—	(—)	—	(—)	19.18
7. Land revenue	6.45	(0.42)	7.03	(0.45)	6.77	(0.37)	6.75	(0.40)	5.90	(1.28)	5.14	(1.05)	1.61
8. Irrigation charges	286.25	(17.89)	298.85	(18.71)	334.46	(18.73)	306.52	(18.45)	—	(—)	—	(—)	306.52
Total ..	1,599.40	(100.00)	1,596.66	(100.00)	1,785.60	(100.00)	1,660.53	(100.00)	461.94	(100.00)	491.11	(100.00)	1,169.42

N.B.: Figures in parenthesis are percentages to the total expenditure.

The lowest performance has been found for Sonora 64, the average yield per hectare being 21.82 quintals with a range of 13.76 quintals to 37.56 quintals. Thus the average yield of wheat per hectare is 27.29 quintals on the participant farms and 7.41 quintals on the non-participant farms, showing nearly a four fold increase in the case of the former as compared to the latter.

Output per Hectare

Output includes the value of the main as well as the by-products. The output for S 227, Lerma Rojo and Sonora 64 has been worked out at Rs. 4,109.24, 2,738.17 and 2,483.57 per hectare respectively. The output per hectare on the participant farms is Rs. 3,110.32 and that on the non-participant farms Rs. 844.74.

TABLE VII—YIELD, OUTPUT AND NET RETURN PER HECTARE ON SELECTED FARMS

Particulars	Participant farms						Non-participant farms	All farms
	Sonora 64	Lerma Rojo	S 227	Average of Mexican wheats	Local wheats	Total wheats		
Yield per hectare (quintals) ..	21.82	24.02	36.05	27.29	6.89	22.19	7.41	19.23
Output per hectare (Rs.) ..	2,483.57	2,738.17	4,109.24	3,110.32	785.46	2,529.11	844.74	2,192.23
Current farm expenditure per hectare (Rs.)	1,599.40	1,596.66	1,785.60	1,660.55	461.94	1,360.90	491.11	1,186.94
Net return per hectare (Rs.)	884.17	1,141.51	2,323.64	1,449.77	323.52	1,168.21	353.63	1,005.29

It has also been observed that at the present lower scale of adoption, the net return per hectare is more than four times on the participant farms as compared to the non-participant farms.

PRODUCTION RESOURCES USED

The new technology of agriculture requires judicious investment on purchased inputs like hybrid seed, fertilizer, weedicide, insecticides, etc., whereas our traditional agriculture represents manpower and hand implement technology, where purchased inputs have little or no place. We shall now examine below as to what extent these inputs have been used on selected farms against the recommended practices.

1. *Seed :* The recommended seed rate for all dwarf wheats in the village has been 98.84 kgs. per hectare but from the analysis of the recommended practices followed we find that only 46.66 per cent cultivators (7) have adopted the recommended seed rate, 20 per cent (3 cultivators) used 74.10 kgs., another 20 per cent

(3) 86.45 kgs. and remaining 13.34 per cent (2 cultivators) have used more than the recommended rate per hectare. The average seed rate used on the participant farms has been found to be 96.33 kgs. per hectare, *i.e.*, 2.53 per cent less than the recommended rate, whereas for local wheat the usual seed rate is 79.07 kgs. per hectare.

2. *Fertilizers:* The recommended doses of N, P_2O_5 and K_20[3] to be used by the farmers are in the order of 370.50 kgs., 494.22 kgs. and 98.84 kgs. per hectare respectively. About 80 per cent cultivators (12), used the recommended dose of urea while the remaining 20 per cent (3) have used between 247 kgs. and and 370 kgs. per hectare. The average dose of urea applied on the participant farms has been of the order of 345.80 kgs. per hectare—less by 24.70 kgs. (6.66 per cent) than the recommended dose.

In the case of use of P_2O_5, as against the recommended dose of 494.22 kgs. per hectare, the average dose used has been worked out at 351.72 kgs. per hectare which was less than 28.83 per cent as compared to the recommended dose; only 20 per cent cultivators (3) have applied the recommended dose, while 20 per cent each have applied the doses in the order of 123.50 kgs., 370.50 kgs., 523.64 kgs. and 247 kgs. per hectare respectively.

The average K_20 applied has been found to be 90.55 kgs. per hectare as against the recommended dose of 98.84 kgs. Thus the difference between the recommended dose and the quantity actually applied has been less by 8.38 per cent. We also find here that 40 per cent cultivators have not applied K_20 at all.

3. *Insecticides:* The recommended dose of BHC to be applied is 24.71 kgs. per hectare. About 80 per cent cultivators (12) responded well while the remaining 20 per cent have ignored completely.

4. *Hired human labour :* On participant farms, hired human labour days required per hectare of wheat production have been estimated at 74.13.

5. *Hired bullock labour :* Only three participant families hired bullocks and thus 3.13 hired bullock labour days per hectare are required for raising the Mexican wheats.

RESOURCES NEEDED FOR THE SUCCESS OF THE NEW AGRICULTURAL STRATEGY

Up to 1967-68, the coverage of Mexican wheats has been very satisfactory in the district HYVP but during 1968-69, the possibility of extension of hybrids of maize and jowar has increased more due to adequate and timely rains. Table VIII shows the input needs for the success of the HYVP at the farm, village and district level, and Rs. 23,12,457 and Rs. 30,962 have been earmarked for the district and village respectively.

It is seen that the level of resources needed for the HYVP of wheat for sampled cultivators is 2.30 per cent of the district, while for all participant families it is 3.95 per cent. On the other hand, the input needs for hybrid jowar and maize are 0.57 per cent of the Indore district.

3. N = Urea ; P_2O_5 = Superphosphate and K_20 = Muriate of potash.

TABLE VIII—INPUT NEEDS OF HYVP FOR 1968-69 AT FARM, VILLAGE AND DISTRICT LEVEL

Crops	Targets (hectares)	Requirement of*						Total credit required (Rs.)
		Seed (quintal)	Fertilizers in quintal			Pesticide		
			Ammonium sulphate	Super-phosphate	Muriate of potash	BHC (quintal)	Endrin (litre)	
1. Mexican wheats								
(*a*) Sampled farms	14	13.84	103.78	69.19	13.83	3.45	35	12,039.02
(*b*) All participant farms	24	23.72	177.91	118.61	23.72	5.93	59	20,638.32
(*c*) Indore district	607	599.96	4,499.87	2,999.91	599.95	149.98	1,499	5,21,977.51
2. Hybrid jowar								
(*a*) Nenod village	14	1.38	51.59	34.59	13.83	6.89	35	6,083.56
(*b*) Indore district	2,428	239.88	8,999.62	5,999.83	2,399.83	1,195.06	5,997	10,55,063.12
3. Hybrid maize								
(*a*) Nenod village	7	1.12	34.59	34.59	5.18	3.44	17	4,240.46
(*b*) Indore district	1,214	194.96	5,999.83	5,999.83	899.93	597.53	2,998	7,35,416.92

* These estimated requirements are based on the "yardsticks" and recommendations of the State level HYVP Seminar for the year 1968-69. 'Normal Credit Statements' have been prepared on the basis of crop plans of participating farmers.

BOTTLENECKS

The main factors that hinder the extension of the new varieties identified during the investigation are related to the problems of implementation, response and success of the HYVP. The problems relating to implementation are (*i*) non-selection or wrong selection of cultivators, (*ii*) change in the acreage under this programme, (*iii*) failure to lift fertilizers or failure to use the recommended doses of fertilizers by the participants, (*iv*) non-availability of seed and, (*v*) failure to link credit with marketing. The main problems concerning the response of the programme are (*i*) it is very costly, (*ii*) attack of birds, pests and diseases, (*iii*) long duration of crop like maize, hence the same field cannot be put under double cropping and its shelling rate is also high, (*iv*) it requires timely and cautious practices and (*v*) demonstrations are not successful.

On the basis of the foregoing analysis, it can be said that the HYVP can give very good results if proper care is taken in time to ensure the use of the required supplies of seeds and fertilizers duly supported by the prescribed package of practices.

DEVELOPING HYBRID SEED ENTERPRISE—AN INDUCED GROWTH OF HIGH-YIELDING VARIETIES PROGRAMME IN INDIA

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INTRODUCTION

It would have been an exercise in imagination if we were to talk about the seed industry in India a decade ago. Now that we are in a position not only to talk about the seed industry, but also we can discuss about the developing hybrid seed industry in India shows how rapidly the so-called stagnant agricultural sector in India is becoming dynamic. A decade ago, only the agricultural research workers (breeders) knew about hybrid seeds. After launching the High-Yielding Varieties Programme (HYVP) in 1966, the hybrid seed is known not only to the educated elite, but also to the un-educated farmers, who adopted the innovation of hybrid seed without hesitation as soon as they found that it gave much higher yield than the local variety of seed. The acceptance of innovation in agriculture seems to take much less time now than in the past. In U.S.A., hybrid corn was planted on about one per cent of the corn acreage in the corn belt in 1933 and almost 100 per cent of the corn acreage was covered by 1955. But it took much