

YIELD RATES OF AND PROFIT MARGIN IN FERTILIZER USE TO HIGH-YIELDING VARIETIES IN IADP DISTRICTS*

K.S. KRISHNAN AND P.C. MEHROTRA
*Institute of Agricultural Research Statistics
New Delhi*

INTRODUCTION

In the modernisation of Indian Agriculture, spread of high-yielding varieties of cereal crops is expected to play a key role along with the adoption of associated improved practices such as high rates of the fertilizer application, controlled use of water, etc. Though high-yielding varieties programme covers five cereal crops, viz., rice, wheat, maize, jowar and bajra, only the first two crops have gained wide acceptance of the farmers in many parts of the country. Of the various areas in which substantial impact has been made by the high-yielding varieties of rice and wheat, the districts covered under the Intensive Agricultural District Programme form a notable group. This is because of the special facilities created under the intensive project, including strengthened and more experienced extension agencies. With a view to collecting authentic information on the performance of high-yielding varieties of crops and the extent to which recommended package of practices are actually being adopted by cultivators, special crop cutting experiments based on probability sampling technique are being conducted in those districts since the year 1966-67. The present paper deals with a study conducted on the data collected from the crop-cut fields during the four years 1966-67 to 1969-70.

2. MATERIAL USED

Data used pertain to rice crop in 14 IADP districts and wheat crop in 6 such districts. The districts covered for rice are West Godavari (Andhra Pradesh), Thanjavur (Tamil Nadu), Palghat and Alleppey (Kerala), Mandya (Mysore), Sambalpur (Orissa), Raipur (Madhya Pradesh), Bhandara (Maharashtra), Surat-Bulsar (Gujarat), Shahabad (Bihar), Burdwan (West Bengal), Cachar (Assam) and

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Jammu and Anantnag (Jammu & Kashmir). The districts covered under wheat are Ludhiana (Punjab), Aligarh (Uttar Pradesh), Shahabad (Bihar), Pali (Rajasthan) and Jammu and Anantnag (Jammu & Kashmir).

Details of the number of crop-cutting experiments conducted on high-yielding varieties and their controls (indigenous varieties), the data from which were analysed are indicated in Table-1. In order to have good spread, only one experiment was conducted in a village on HYV. As far as possible, experiments on controls were located in the same set of villages in which experiments on HYV were conducted. However, in such districts where very wide coverage under HYV have been achieved, control experiments could not be laid in many of the villages selected for conducting crop cutting experiments on HYV.

3. RESULTS AND DISCUSSION

(a) *Area Under HYV :*

The area reported to have been covered under high-yielding varieties of rice and/or wheat in these districts during the four years 1966-67 to 1969-70 are presented in Table-2.

Area under high-yielding varieties of rice has made rapid progress during the four years in the IADP districts of Thanjavur, Anantnag, Jammu, Alleppey and Shahabad. Moderate success has been achieved in the districts of West Godavari, Surat-Bulsar, Burdwan, Palghat, Raipur and Sambalpur. The coverage was small in Cachar and Mandya.

When the predominantly rice growing IADP districts were grouped into zones, it was observed that the coverage under high-yielding varieties during 1969-70 was nearly 46 per cent of the area under the crop in the southern zone as against 18 and 11 per cent respectively in the eastern and the central zones. The bulk of the coverage in the southern zone was, however, accounted for by the indigenously developed high-yielding varieties such as CO-25 and ADT-27 in Thanjavur district. In the central and eastern zones also indigenously developed strains accounted for substantial proportions of the areas reported to have been covered under HYV. Of these, Safri-17, NC-678 and SC-412/125 respectively popularised in the districts of Raipur, Burdwan and Cachar are the notable ones. The exotic varieties accounted for nearly 72 per cent of the coverage

under HYV in the eastern zone, 52 per cent in the central zone and 26 per cent in the southern zone.

In respect of wheat, the adoption of high-yielding varieties was almost complete in Ludhiana, while about 80 and 60 per cent respectively of the wheat area in Aligarh and Shahabad districts were accounted for by the new varieties. In Aligarh, about one-third of the coverage under HYV during 1969-70 was accounted for by indigenously developed varieties such as K-68 and C-306.

(b) *Yield Rates of Rice :*

Estimates of yield rates of high-yielding and control (indigenous) varieties of rice and wheat during the four years 1966-70 along with the percentage increase in the average yield of high-yielding varieties over control are presented in Table-3. Average rates of consumption of chemical fertilizers ($N + P_2O_5 + K_2O$ together in kg. per hectare) for HYV and their indigenous controls were also estimated which are summarised in Table-4.

Mean yield rates of high-yielding varieties of rice in different districts ranged from 14 to 36 quintals per hectare during the period 1967-70. An exceptionally high-yield rate of about 40 quintals was achieved in Palghat district during 1967-68, but the coverage was limited to only about 2 per cent of the area under the rice crop in that district. The trends in the yield rates of HYV in different zones during the three years 1967-70 along with the mean increase over the indigenous controls are summarised in the table below (page 79).

It may be seen from this table that in all the three years, the additional yield for high-yielding varieties over the controls was the highest in the central zone. The additional yield of 8.2 quintals per hectare obtained in the central region is nearly one-half of the target fixed under the 4th Plan, namely, 16.7 quintals. Both in the southern and eastern zones, additional yields were still lower than the targets. Such shortfall is to be ascribed principally to the lower yield potential of the indigenously developed high-yielding varieties compared to that of the exotic varieties such as IR-8 and IR-5. Other contributory factors are the heavy incidence of plant diseases and pests and the lower rates of fertilizer application adopted by cultivators.

In order to ascertain how far the exotic varieties of rice have fulfilled the expectations, an examination of the performance of

Zone	IADP districts in the zone	Year	Av. yield of rice for HYV	Additional yield for HYV over contr ol	
				In Q/ha of rice	as percent- age increase
Southern	West Godavari, Thanjavur, Palghat, Alleppey and Mandya	1967-68	18.6	5.2	39
		1968-69	21.4	5.7	37
		1969-70	20.0	5.7	40
		Pooled	20.0	5.5	39
Central	Samabalpur, Raipur, Surat-Bulsar	1967-68	20.6	7.9	62
		1968-69	21.9	9.2	72
		1969-70	19.0	7.6	66
		Pooled	20.5	8.2	67
Eastern	Shahabad, Burdwan and Cachar	1967-68	16.1	5.1	46
		1968-69	19.3	5.9	44
		1969-70	19.1	6.9	57
		Pooled	18.2	6.0	49

IR-8, the most common variety tried in all the above three regions was undertaken in fields where fertilizer doses of 140 kg. and above per hectare of nutrients (N+P₂O₅+K₂O together) were applied. The salient results are indicated below :

Zone	Sampled fields under IR-8 with fertilizer dose of 140 kg. and above per hectare		Pooled average for all HYV together
	Percentage to the total sampled fields	Average yield (Q/ha)	
Southern	55.9	35.7	20.0
Central	41.7	28.7	20.5
Eastern	10.3	29.1	18.2

It may be seen that the average yield for IR-8 variety in fields with high doses of fertilizer application was in excess of the pooled average for all the high-yielding varieties of rice together by 15.7

quintals per hectare in the southern zone, 8.2 quintals in central zone and 10.9 quintals in the eastern zone. If these yield differentials are added to the additional yields for HYV over the controls indicated in the previous paragraphs, the resultant excess yield for IR-8 over the indigenous varieties have just fulfilled the expectations in the eastern and central zones, in such cases where satisfactory doses of fertilizer application were adopted. In the southern zone, the achievement in such fields was even better than the target.

Considering the results relating to the spread as well as the yield rates of high yielding varieties in different zones presented in earlier paragraphs, it would appear that the overall performance of the high-yielding varieties in the IADP districts during the period 1967-70 has been substantially higher than that of the indigenous varieties selected as control, but the additional yield realized was far short of the expected target fixed under the Fourth Plan. However, IR-8 variety of rice in fields where satisfactory doses of fertilizers were applied, has fulfilled the expectations. The overall shortfall in the southern zone is explained largely by the low yield potential of indigenously developed high-yielding varieties which accounted for the bulk of the area covered under the high-yielding varieties programme in the zone. In the central zone, the deficiency is explained partly by the lower doses of fertilizer application to exotic varieties and the inclusion of the area under indigenously developed varieties in the coverage under the high-yielding varieties programme. In the eastern zone, where bulk of the fields under the exotic varieties received less than 140 kg. of plant nutrients per hectare, the major cause for the shortfall was the incomplete adoption of the package of practices.

(c) Yield rates of wheat

Mean yield rates obtained for high-yielding varieties of wheat in Ludhiana district showed a continuous decline during the past three years. During the first year, viz., 1965-67 when only about 5 per cent of the wheat area in the district was put under Mexican varieties, a high per hectare yield rate of 47 quintals was obtained. With about 96 per cent coverage in 1969-70, the mean yield rate for the new varieties fell to about 31.5 quintals per hectare. In other IADP districts, the average yield for the exotic varieties of wheat during the past three years ranged from 15.2 to 22.3 quintals per hectare. The increase in average yield for HYV over the indigenous controls, pooled over the past three years was of the order of 15.1 quintals

for Ludhiana, 10.0 quintals for Jammu, 7.0 quintals for Shahabad and 6.1 quintals for Aligarh. In terms of the percentage increase of HYV over the controls, the additional yields were of the order of 71 for Ludhiana, 115 for Jammu, 67 for Shahabad and 42 for Aligarh. The additional yield obtained for HYV in Ludhiana district compared favourably with the targets fixed under the Fourth Plan, but the position in the other IADP districts is not so satisfactory.

When wheat fields under exotic varieties with high doses of fertilizer application (i.e., 140 kg. and above of plant nutrients per hectare) were considered the estimates of average yield pooled over the last three years obtained for Ludhiana, Aligarh, Shahabad and Jammu were 39.7 quintals, 29.2 quintals, 28.1 quintals and 24.4 quintals per hectare respectively. If these estimates were compared with the average yields for indigenous varieties grown in the control fields, the additional yields for the farmers ranged from 14.3 quintals in Aligarh to 19.0 quintals in Ludhiana. This shows, that as in the case of rice, the exotic varieties of wheat with satisfactory levels of fertilizer application have mostly fulfilled the expectations. The shortfall in the additional yield obtained in Aligarh, Shahabad and Jammu for the high-yielding varieties, indicated in the previous paragraph, where all sampled fields were taken together is explained by the fact that in nearly 90 per cent of such fields, fertilizer doses adopted were below 140 kg. per hectare of nutrients. In Aligarh, the relatively lower yield potential of K-68, the indigenously developed variety, which accounted for nearly one-third of the coverage under the high-yielding varieties programme during 1969-70, was also a contributory factor.

(d) Profit Margin to Fertilizer Use

The adoption of high-yielding varieties involves substantial investment in the form of physical and labour inputs. Hence a study was undertaken to ascertain the net profit per hectare and the return per rupee invested for the popular high-yielding strains in the different IADP districts. For this purpose, estimates of yield rates and the rates of consumption of different plant nutrients presented in Tables-3 and 4 were utilised. Other relevant information, such as, cost of plant protection chemicals used, labour employed and price differential between HYV and ordinary varieties seeds were, however, not collected for the fields sampled for crop cutting experiments. On an average, the rate of consumption of plant nutrients for HYV was about 110 kg. per hectare as against nearly 40 kg. per

hectare for indigenous varieties. The differential input cost on fertilizers (HYV over controls) was estimated as Rs. 142 per hectare. From a limited data collected in respect of a few centres, the differential input cost for other factors was estimated as Rs. 43 (roughly Rs. 20 for plant protection chemicals, Rs. 18 for labour and Rs. 5 for seed). It was also ascertained through enquiry that the differential cost between high-yielding and indigenous varieties on these items can be considered as roughly proportional to the differential input cost on fertilizers. Thus the overall additional investment for the HYV could be taken as 130 per cent of the cost of differential rates of fertilizer consumption to the fields sown with high-yielding and indigenous varieties respectively. The average additional investment and return per hectare for HYV over the indigenous controls, the net profit for HYV and the return per rupee invested for HYV were worked out on the data for the years 1968-70 which are presented in Table-5.

The net profit per hectare for IR-8 variety of rice averaged over the two years ranged from Rs. 289 in Shahabad to Rs. 1093 in Thanjavur. In the districts of West Godavari and Surat-Bulsar, the net profit was of the order of Rs. 800 or more per hectare. Return per rupee invested for HYV exceeded Rs. 4.50 in the districts of Surat-Bulsar, Burdwan and Mandya. In the remaining districts, it ranged from about Rs. 2.50 to Rs. 4.00. Among the other high-yielding varieties tried, Masuri in Surat-Bulsar gave excellent net profit and highest return of about Rs. 6.20 per rupee invested.

In respect of TN-1 variety, the net profit as well as return per rupee invested for high-yielding varieties were lucrative only in Alleppey district. The return per rupee invested for this variety was of the order of Rs. 4.00 for Alleppey but less than Rs. 2.60 in Sambalpur as well as Raipur.

The indigenously developed high-yielding varieties, viz., ADT-27 in Thanjavur, Safri-17 in Raipur and NC-678 in Burdwan yielded moderate net profits ranging from Rs. 280 to Rs. 320 per hectare. In terms of net rupee invested, however, the return exceeded Rs. 3.90 in all the cases.

For the exotic varieties of wheat, the net profit per hectare during 1968-70 ranged from Rs. 380 for Shahabad (Lerma Rojo) to Rs. 968 for Ludhiana (Kalyan Sona). Return per rupee invested was, however, the highest in Shahabad (Rs. 5.81 for Lerma Rojo). In

Aligarh district, where the indigenously selected variety K-68 was popularised along with the exotic varieties, the return per rupee invested for K-68 exceeded that for all the exotic varieties tried in the district. However, the net profit per hectare was the least for K-68.

From the foregoing analysis, it may be inferred that lower rates of fertilizer application coupled with the lower-yield potential of the indigenously developed high-yielding varieties compared to that of the exotic varieties, which accounted for the bulk of the area covered under the high-yielding varieties programme are contributory reasons for the short-falls in the targets fixed for the yield rates of high-yielding varieties under the Fourth Five Year Plan. Nevertheless, the exotic varieties adopted with satisfactory doses of fertilizers have more or less fulfilled the expectations. The net profit per hectare and the return per rupee invested for the high yielding varieties of wheat were found to be attractive in all the districts and for rice in most of the districts.

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TABLE 1
Total number of crop-cut experiments conducted on high-yielding and indigenous (control) varieties of rice and wheat in the IADP districts during the four years 1966-67 to 1969-70

District	Crop	Season	High-yielding varieties				Indigenous (control) varieties			
			1966-67	1967-68	1968-69	1969-70	1966-67	1967-68	1968-69	1969-70
West Godavari	Rice	First Crop	75	166	74	131	74	162	72	100
"	"	Second Crop	17	85	120	188	283	82	260	195
Thanjavur	"	Kuruvai	71	232	237	345	71	66	56	35
"	"	Thaladi	—	73	75	192	—	71	75	160
Palghat	"	Kharif	85	70	96	100	84	70	96	96
Alleppey	"	"	—	—	41	21	—	—	25	236
"	"	Punja	—	53	156	174	—	53	67	109
Mandya	"	Kharif	—	42	62	91	—	40	58	89
Sambalpur	"	"	66	76	79	94	66	59	52	75
"	"	Summer	40	100	105	132	40	78	79	44
Raipur	"	Kharif	73	618	184	187	69	569	168	154
Bhandara	"	"	52	75	—	—	52	62	—	—
Surat-Bulsar	"	"	46	137	189	168	46	133	186	167
Shahabad	"	"	98	73	81	72	98	73	80	69
Burdwan	"	Winter	67	68	68	75	67	68	65	75
Cachar	"	Kharif	57	82	120	116	56	78	38	106
Jammu	"	"	—	60	97	97	—	34	188	139
Anantnag	"	"	—	—	—	64	—	—	—	172
Ludhiana	Wheat	Rabi	31	212	262	270	247	137	16	16
Aligarh	"	"	63	78	170	275	63	78	212	135
Shahabad	"	"	26	77	126	108	293	77	248	293
Pali	"	"	—	93	—	—	—	82	—	—
Jammu	"	"	—	67	116	128	—	36	191	163
Anantnag	"	"	—	—	58	—	—	—	100	—
Total	Rice	Kharif & Rabi	747	2008	1784	2247	1006	1698	1565	2021
	Wheat	Rabi	120	527	732	781	603	410	767	607

TABLE 2
 Area reported to have been covered under high-yielding varieties of rice and wheat in the IADP districts during the four years 1966-67 to 1969-70

District	Crop	Area under high-yielding varieties (ha)				Area under high-yielding varieties expressed as a percentage of the total cropped area			
		1966-67	1967-68	1968-69	1969-70	1966-67	1967-68	1968-69	1969-70
West Godavari	Rice	7312	15930	32768	61101	2.1	4.4	9.9	15.7
Thanjavur	"	94198	253506	232287	522130	15.5	40.0	36.9	80.3
Paighat	"	15497	4255	19365	21566	8.0	2.2	9.2	10.2
Alleppey	"	801	3815	41451	29872	1.0	4.7	47.8	35.1
Mandya	"	576	129	343	1655	1.3	0.2	0.6	3.2
Sambalpur	"	12823	22840	40261	51233	2.3	4.0	7.6	9.4
Raipur	"	11573	17442	40016	75629	1.6	2.4	5.9	11.2
Bhandara	"	2571	2029	≠	≠	1.0	0.7	≠	≠
Surat-Bulsar	"	76	1216	5898	19187	0.1	0.8	4.0	13.2
Shahabad	"	3146	54631	67010	94660	1.0	17.2	20.5	29.0
Burdwan	"	8297	29149	40000	50000	2.6	8.2	12.1	14.4
Cachar	"	389	2047	5087	8883	0.2	1.0	2.5	4.6
Jammu	"	@	10905	13401	15117	@	42.6	35.3	48.2
Anantnag	"	@	@	@	47389	@	@	@	61.9
Ludhiana	Wheat	7290	99190	186570	215926	4.5	59.8	88.3	95.5
Aligarh	"	6230	74254	113727	131459	5.0	44.2	70.8	77.5
Shahabad	"	10926	79938	91921	106105	6.7	47.2	53.2	59.7
Pali	"	304	4047	≠	≠	0.5	5.0	≠	≠
Jammu	"	@	17435	19556	18718	@	27.0	27.4	26.2
Anantnag	"	@	@	278	930	@	@	3.9	13.1

@ Crop cutting experiments on high-yielding varieties not conducted.

≠ IADP as well as assessment surveys were discontinued.

TABLE 3

Yield rates of high-yielding and indigenous (control) varieties of rice and wheat in the IADP districts during the four years 1966-67 to 1969-70

District	Crop Season	Estimated average yield (Q/ha)				Percentage increase in average							
		High-yielding varieties				Indigenous (control) varieties							
		1966-67	1967-68	1968-69	1969-70	1966-67	1967-68	1968-69	1969-70	1966-67	1967-68	1968-69	1969-70
1	2	3	4	5	6	7	8	9	10	11	12	13	14
RICE													
West Godavari	First Crop	23.2	31.5	34.7	27.9	18.9	21.2	21.1	14.5	23	49	64	92
"	Second crop	22.1	35.9	34.6	27.6	16.0	17.8	17.2	14.6	38	102	101	90
Thanjavur	Kuruvai	18.6	19.9	20.3	23.6	12.6	14.4	15.8	15.5	48	38	28	52
"	Thaladi	@	10.0	15.9	15.9	@	9.3	14.6	12.0	@	8	9	32
Palghat	Kharif	27.5	40.1	31.5	26.1	18.3	16.8	19.3	18.0	50	139	63	45
Alleppey	"	@	@	20.8	15.8	@	@	11.2	10.0	@	@	86	58
"	Punja	@	34.2	21.8	20.3	@	16.8	13.7	13.9	@	104	59	46
Mandya	Kharif	@	24.5	29.5	35.2	@	21.5	26.9	28.0	@	14	10	26
Sambalpur	"	11.4	19.2	18.2	15.6	6.1	10.0	9.3	8.4	87	92	96	86

1	2	3	4	5	6	7	8	9	10	11	12	13	14
<i>Sambalpur</i>	Summer	21.7	30.5	26.3	19.8	12.0	15.3	13.5	11.9	81	99	95	66
<i>Raipur</i>	Kharif	14.2	16.7	20.1	18.1	9.7	13.3	12.8	11.1	46	26	57	63
<i>Bhandara</i>	"	12.2	15.0	≠	≠	9.3	11.1	≠	≠	30	35	≠	≠
<i>Surat-Bulsar</i>	"	15.6	18.4	18.8	27.9	14.6	13.4	10.2	13.6	7	37	84	107
<i>Shahabad</i>	"	14.4	13.8	16.3	14.3	7.9	9.2	11.6	9.8	82	50	41	46
<i>Burdwan</i>	Winter	20.8	20.3	24.0	26.0	15.6	14.5	16.3	15.9	33	40	47	64
<i>Cachar</i>	Kharif	@	20.1	24.6	24.0	@	13.7	14.6	11.6	@	47	76	107
<i>Jammu</i>	"	@	24.2	14.8	16.5	@	15.7	11.6	14.2	@	54	28	16
<i>Anantnag</i>	"	@	@	@	36.0	@	@	@	26.0	@	@	@	38
WHEAT													
<i>Ludhiana</i>	Rabi	47.3	40.5	35.5	31.4	23.6	23.2	18.8	20.1	100	75	89	49
<i>Aligarh</i>	"	29.6	21.2	19.6	22.3	19.4	15.6	15.1	14.0	53	36	30	59
<i>Shahabad</i>	"	15.7	17.1	18.9	17.1	6.8	9.9	11.1	11.2	131	78	70	53
<i>Pali</i>	"	@	17.3	≠	≠	@	11.7	≠	≠	@	48	≠	≠
<i>Jammu</i>	"	@	19.9	20.4	16.9	@	11.0	8.3	7.8	@	81	146	117
<i>Anantnag</i>	"	@	@	15.2	N.A.	@	@	7.2	N.A.	@	@	111	N.A.

@ Crop-cutting experiments on high-yielding varieties not conducted.
 ≠ IADP as well as assessment surveys were discontinued.
 N.A. Not available.

TABLE 4
Average rates of consumption of chemical fertilizers to high-yielding and indigenous (control) varieties of rice and wheat in the IADP districts during the four years 1966-67 to 1969-70

District	Crop-season	Exotic/ Indigenously developed (I.D.)	Average rates of consumption of chemical fertilizers (N+P ₂ O ₅ +K ₂ O in Kg./ha)								
			Fields sown with high-yielding varieties.				Fields sown with indigenous (control) varieties				
			1966-67	1967-68	1968-69	1969-70	1966-67	1967-68	1968-69	1969-70	
1	2	3	4	5	6	7	8	9	10	11	
RICE											
West Godavari	First Crop	Exotic	123	119	139	146	18	29	27	26	
"	Second crop	"	136	192	187	191	68	80	79	86	
Thanjavur	Kuruvai	"	—	—	—	180	}	33	35	30	31
"	"	I.D.	63	57	51	64					
"	Thaladi	Exotic	@	—	—	148	}	@	46	53	61
"	"	I.D.	@	49	58	56					
Palghat	Kharif	Exotic	177	269	168	126	29	34	45	41	
Alleppey	"	"	@	@	178	134	@	@	67	55	
"	Punja	"	@	237	187	172	@	105	116	109	
Mandya	Kharif	"	@	148	221	215	@	96	114	114	
Sambalpur	"	"	148	151	117	79	11	11	29	16	
"	Summer	"	185	176	159	155	73	56	42	46	

I	2	3	4	5	6	7	8	9	10	11
Raipur	Kharif	Exotic	137	81	132	116	{ 18 }	26	24	} 22
"	"	I.D.	@	45	63	56				
Surat-Bulsar	"	Exotic	70	62	101	109	32	30	34	34
Bhandara	"	"	75	53	≠	≠	8	6	≠	≠
Shahabad	"	"	91	58	58	83	11	14	22	19
Burdwan	Winter	"	115	131	101	95	{ 14 }	19	15	} 23
"	"	I.D.	64	48	65	59				
Cachar	Kharif	Exotic	@	155	78	60	{ @ }	4	1	} *
"	"	I.D.	@	41	29	24				
Jammu	"	Exotic	@	106	15	25	@	31	6	3
Anantnag	"	"	@	@	@	45	@	@	@	14
WHEAT										
Ludhiana	Rabi	Exotic	149	128	134	106	44	68	31	42
Aligarh	"	"	99	61	77	79	{ 26 }	17	20	} 17
"	"	I.D.	@	46	39	27				
Shahabad	"	Exotic	64	62	70	61	15	28	26	27
Pali	"	"	@	99	≠	≠	@	7	≠	≠
Jammu	"	"	@	98	43	38	@	20	1	3
Anantnag	"	"	@	@	86	N.A.	@	@	2	N.A.

@ Crop-cutting experiments on high-yielding varieties not conducted.
 ≠ IADP as well as assessment surveys were discontinued.
 N.A. Not available.
 * Negligible.

TABLE 5

Additional investment and additional return through adoption of high-yielding varieties of rice and wheat in the IADP districts averaged over the two years 1968-69 and 1969-70

<i>District</i>	<i>Crop</i>	<i>Season</i>	<i>High-yielding variety name/ strain No.</i>	<i>Average addl. investment per hectare for HYV (Rs.)</i>	<i>Average addl. return per hectare for HYV (Rs.)</i>	<i>Net profit per hectare for HYV (Rs.)</i>	<i>Return per rupee invested for HYV (Rs.)</i>
1	2	3	4	5	6	7	8
West Godavari	Rice	First Crop	IR-8	343	1151	808	3.36
"	"	Second Crop	"	311	1242	931	3.99
Thanjavur*	"	Kuruvai	"	394	1487	1093	3.77
Palghat	"	Viruppu	"	269	1005	736	3.74
"	"	Mundakan	"	237	642	405	2.71
Alleppey	"	Kharif	"	240	788	548	3.28
"	"	Punja	"	197	549	352	2.79
Mandya*	"	Kharif	"	210	954	744	4.54
Sambalpur	"	"	"	234	846	612	3.62
"	"	Summer	"	295	943	648	3.20
Raipur	"	Kharif	"	355	917	562	2.58
Surat-Bulsar*	"	"	"	201	990	789	4.92

1	2	3	4	5	6	7	8
Shahabad	Rice	Kharif	IR-8	149	438	289	2.94
Burdwan	"	Winter	"	193	903	710	4.68
Alleppey	"	Punja	TN-1	129	512	383	3.97
Sambalpur	"	Kharif	"	177	410	233	2.32
"	"	Summer	"	288	736	448	2.56
Raipur	"	Kharif	"	169	270	101	1.60
West Godavari*	"	First Crop	IR-5	317	864	547	2.73
Thanjavur*	"	Thaladi	"	221	702	481	3.18
Surat-Bulsar	"	Kharif	Masuri	194	1209	1015	6.23
Thanjavur	"	Kuruvai	ADT-27	78	377	299	4.83
Raipur	"	Kharif	Safri-17	110	428	318	3.89
Burdwan	"	Winter	NC-678	95	378	283	3.98
Ludhiana	Wheat	Rabi	Kalyan Sona	248	1216	968	4.90
Aligarh	"	"	"	191	815	624	4.27
Jammu	"	"	"	151	564	413	3.74
Ludhiana	"	"	S-308	273	1128	855	4.13
Aligarh	"	"	"	219	804	585	3.67
Shahabad*	"	"	"	139	677	538	4.87
Aligarh*	"	"	Sonalika	209	919	710	4.40
Shahabad	"	"	Lerma Rojo	79	459	380	5.81
Aligarh	"	"	K-68	41	232	191	5.66

Basis for calculation:

Rice Re. 0.80 per kg. of rice
Wheat Re. 0.80 " wheat

Nitrogen Rs. 2.50 " N
Phosphoric acid Rs. 2.00 " P₂O₅
Potash Re. 0.90 " K₂O

* The information pertains to only one year, viz., 1969-70