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Risk and profitability of rice seed production in the union territory of Puducherry

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ABSTRACT

The present study assesses the risk and profitability of rice seed production in the Union Territory of Puducherry. The percentage analysis and linear discriminant functions were used to analyze the data. The findings of the study indicated that seed production was profitable but a risky venture. A few farmers withdrew from the seed production programme in the initial stage due to non-availability of seeds, poor rainfall, poor germination, grazing and admixture. During the final stage of production, farmers faced the risk of rejection due to presence of other distinguishable varieties and germination failures. The farmers also faced the problems of late payment made by the purchasing agency, late release of subsidy, timely non-availability of seeds. The analysis on economics of seed production indicated that the expenditure on miscellaneous items like drying, marketing, registration and field inspection charges contributed towards the differences between the seed and commercial production. The cost of cultivation was higher in seed production as compared to the commercial production. The total return was higher in seed production than commercial crop production. The discriminant analysis indicated that there were significant differences in the gross return between seed production and commercial rice production.

Key words: *rice seed production, risks, problems, Puducherry*

The success and sustenance of improved rice technology depends on the economically efficient seed production and distribution systems, so as to provide good quality seed at reasonable price on right time to the farmers. Rice is an important food crop of Union Territory of Puducherry accounting about 63 per cent of the total cropped area and contributes about 98 per cent of total food grain production (Anonymous, 2005). Seed production programmes are implemented through National Seeds Corporation Ltd., State Farms Corporation of India Ltd., State Seeds Corporations, other State Seed Producing Agencies and Private Seed Companies. All most all the states of India have their own seed certification agency. During 2000, Puducherry Seed Certification Agency was established by the Government of Puducherry. Since the establishment of Puducherry Seed Certification Agency, no study was undertaken to evaluate the impact of seed production programme in the Union Territory of Puducherry. Hence the present study is undertaken to know the production risks and problems associated with rice seed production, profitability of rice seed production vis-à-vis commercial production. and to specify the variables that are discriminating the seed production from commercial production.

MATERIALS AND METHODS

The study was conducted in the Union Territory of Puducherry. One hundred twenty rice seed growers were selected accounting 25 percent of registered rice seed growers. A matching sample of the same number of farmers, having commercial rice cultivation was selected randomly from the same village. Therefore, the totals of 240 sample farmers were interviewed for the present study.

The primary data were collected from the selected sample farmers for the selected crops and the officials during January and February 2006. The data pertained to the agricultural year 2005-06. The data were collected through a suitable pre-tested schedule. Various policies and acts influenced by the political and

economic conditions of the Government and the critical review by different personnel were collected and discussed for the preparation of the schedule. Secondary data on quantity of seeds certified, total area under seed production, number of farmers registered for seed production, number of farmers failed in seed certification and the causes for the failure were collected from the Seed Certification Agency, Puducherry pertaining to the year 2004-05.

The Garrett's ranking technique was used to rank the factors that influenced the choice of variety. The linear discriminant function analysis was used to identify the variables that are important in discriminating between two groups of farms. In multivariate analysis, linear discriminant function, which is better than any other linear function, will discriminate between any two chosen classes (Dillion and Goldstein, 1984). In the present study linear discriminant function analysis was used to know the relative importance of different variables, of their power to discriminate between two groups of farms of equal size i.e., seed production and commercial production of rice. Mahalanobis D^2 statistic was used to measure the discriminating distance between the two groups.

RESULTS AND DISCUSSION

Rice seed production is a risky business as compared to the commercial rice crop production. However, farmers selected seed production based on several criteria (Table 1). One of the most important criterions was higher profit as the farmers assigned first rank. The other important criteria were the subsidy given by the government especially to the seed producing farmers, technical assistance rendered by the departmental officials as well as better yield of the seed crop attracted the farmers to take part in the rice seed production programmes.

Seed production involves several risks. Nearly 18 per cent of sample farmers withdrew from the seed production programme during 2005-06 due to several reasons (Table 2).

The total of 560 was registered as seed producers with 418.03 ha land and produced 87829.30 kilograms of foundation seeds and 738293 kilograms of certified seeds during the year 2004-05. About, 167 (29.82 per cent) rice seed producers' seed could not be procured due to label for rejection in the field (15 per cent), other distinguishable varieties (8.92 per cent) and various other reasons (5.35 per cent) (Table 3). Therefore, farmers have to face the risk of rejection due to strict adherence of quality parameters by the seed certifying agency to maintain the seed genetic purity and quality.

The problems of the farmers regarding the seed production programme were collected from the farmers (Table 4). About 50.00 per cent of farmers expressed their view on the late payment made by the purchasing agency. Timely non-availability of seeds was considered (29.27 per cent) as another major problem.

Table 1. Reasons for choosing the rice seed production based on Garret ranking selection factor results

Reasons	Mean Score	Rank
Higher profit	66.91	1
Subsidy	60.62	2
Technical assistance	31.35	3
Better yield	29.70	4

Source: Pouchepparadjou, A., K.Thimmappa, G.Sarada and K.Vijayasarathy (2006)

Table 2. Reasons for withdrawal from rice seed production

Reasons	Percentage
Admixture	(33.33)
Maintenance	(6.67)
Non-availability of seeds	(20.00)
Poor germination	(13.33)
Rainfall	(6.67)
Grazing	(20.00)

Note: Figures in parentheses include percentage to the total sample farmersSource: Pouchepparadjou, A., K.Thimmappa, G.Sarada and K.Vijayasarathy (2006)

Table 3. Reasons for non procurement of rice seeds from the farmers

LFR	84 (15)
GF	3 (0.53)
ODV	50 (8.92)
Other reasons	30 (5.35)
Total	167 (29.82)

Note: Figures in parentheses indicate percent 560 farmers registered as seed growers during 2004-05.LFR = Label for rejection in the field, GF = Germination failure, ODV = Failed in Other Distinguishable VarietiesSource: Pouchepparadjou, A., K.Thimmappa, G.Sarada and K.Vijayasarathy (2006)

Economics of seed production vis-à-vis commercial production has been studied and compared, so as to analyze the feasibility of seed production over commercial production (Table 5).

Table 4. Problems regarding the seed certification programme

Problems	(Percentage)
Late release of subsidy	35.36
Non availability of desired variety in time	24.39
Non availability of seeds	29.27
Delay in Processing	15.85
Restriction in allotment of areas	13.41
Poor quality of inputs	9.76
Late Payment	50.00

Source: Pouchepparadjou, A., K.Thimmappa, G.Sarada and K.Vijayasarathy (2006)

The total costs of cultivation were Rs.7538 per acre and Rs.9394 per acre for grain and seed production respectively. Total returns were Rs. 10618 per acre and Rs. 20149 per acre for commercial and seed production respectively that was mainly because of the share of incentives that alone accounted to Rs. 7142 per acre under seed production.

The share of seed cost under seed production in paddy was comparatively lesser than the costs incurred for the same under commercial production. This is due to the fact that the seed producers used recommended quantity of seed rate where as grain producers used more seed rate than the recommended rate and often they used twice the recommended seed rates. In addition, the role of incentives in the purchase of certified seeds has a greater role to play in affecting the share of seed cost under seed production.

Table 5. Operation wise comparison of costs in rice crop

Operation	Commercial crop	Rs. acre^{-1}	Seed crop
Nursery			
Field preparation	250 (3.32)		250 (2.66)
Seeds and sowing	729.83 (9.68)		533.39 (5.68)
Seed treatment	9.32 (0.12)		14.78 (0.16)
Weeding	0 (0)		90.36 (0.96)
Plant protection	12.71 (0.17)		12.97 (0.14)
Fertilizers	121.95 (1.62)		377.6 (4.02)
Irrigation	100 (1.33)		100.16 (1.07)
Main field			
Field preparation	1015.51 (13.47)		1127.10 (12.00)
Transplanting	1049.49 (13.92)		1075.14 (11.44)
Manures	0 (0)		448.55(4.77)
Fertilizers	1237.85 (16.42)		1264.05 (13.45)
Plant protection	56.61 (0.75)		59.56 (0.63)
Irrigation	200.61 (2.66)		215.61 (2.30)
Weeding	766.78 (10.17)		1174.6 (12.50)
Harvesting and thrashing	1797.12 (23.84)		1740.14 (18.52)
Drying	-		131.45 (1.40)
Marketing	190.23 (2.52)		203.91 (2.17)
Total seed inspection fee	-		575.36 (6.12)
Total cost of cultivation	7538.01		9394.73
Yield (kg)	2034.75		1972.86
Incentives	-		7142.61
Total returns (inclusive of incentives)	10618.22		20149
Net returns	3080.21		10754.27
Benefit cost ratio	1.41		2.14

Figures in parenthesis include percentage to total cost of cultivation

Therefore the cost of cultivation was higher in seed production than the commercial production. The seed grower has to strictly adhere to the recommended cultural practices to ensure genetic purity as laid down by the seed certification agency. Seed production plot must be weed free and during flowering stage the off types need to be removed manually to maintain genetic purity. Proper drying of seeds and preliminary processing is another special operation in seed production. All these operations required additional labour. Moreover, certification charges are an additional expense in seed production. Hence, cost of cultivation was higher in seed production as compared to the commercial production.

Another significant observation was that the total return was higher in seed production than commercial crop production. This was due to various incentives given by the Government to seed growers to induce the farmers to take up seed production.

The results of discriminant function analysis Table 6 are useful in distinguishing the two groups of farms in paddy cultivation as the D^2 value was found to be statistically significant at one per cent level of probability. It could be inferred that gross return with 80.81 per cent and miscellaneous with 17.34 per cent were the two major contributing factors to discriminate between the seed production and grain production of paddy. This indicates that there were significant differences in the gross return between seed production and grain production in paddy. Similarly it is evident from the analysis that expenditure on miscellaneous items like drying, marketing, registration and field inspection charges contributed towards the significant differences between seed and commercial production.

Thus it may be concluded that the farmers faced the risk of rejection due to the presence of other distinguishable varieties and germination failures. The farmers also faced the problems of late payment made by the purchasing agency, late release of subsidy, non-availability of seeds in time and delay in processing. The analysis on economics of seed production indicated that the expenditure on miscellaneous items like drying, marketing, registration and field inspection charges contributed towards the significant differences between the seed and commercial production. The findings of the study indicate that the cost of cultivation was higher in seed production as compared to the commercial production. But the total return was higher in seed production than in commercial crop production. The discriminant analysis indicated that there were significant differences in the gross return between seed production and commercial production. The expenditure

Table 6. Particulars of discriminant variables in rice farms

Item	Mean (Rs.)		Mean difference (Rs.)	Discriminant coefficient(L_i)	(L_i) (d_i)	Percent Contribution to the total distance
	Group I (Seed production)	Group II (Commercial production)				
Age (X_1)	49.797	42.949	6.848	0.162	1.109	0.034
Experience (X_2)	21.712	17.644	4.068	-0.311	-1.265	-0.039
Farm size (X_3)	10.174	5.301	4.873	0.211	1.028	0.032
Cropping intensity (X_4)	247.458	255.932	-8.474	-0.069	0.585	0.018
Human labour (X_5)	5498.814	5038.22	460.594	0.030	13.818	0.427
Machine labour (X_6)	1556.271	1470.678	85.593	0.040	3.424	0.106
Fertilizer (X_7)	1412.119	1007.373	404.746	0.115	46.546	1.438
Plant protection (X_8)	39.661	41.102	-1.441	-0.124	0.179	0.006
Processing (X_9)	1837.373	1797.119	40.254	-0.141	-5.676	-0.175
Miscellaneous (X_{10})	773.983	190.847	583.136	0.963	561.560	17.343
Gross return (X_{11})	20309.41	10618.22	9691.187	0.270	2616.62	80.812

Note: X = Variables D^2 = 3237.928 ** F – statistic = 205.61, Z_1 = 6340.894, Z_2 = 3102.966, Z = 4721.930
Miscellaneous include registration, field inspection, marketing charges and seed testing charges.
** indicate significance at 1 per cent level of probability

on miscellaneous items like drying, marketing, registration and field inspection charges contributed towards the significant differences between the seed and commercial production.

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