

A Conjoint Analysis of Farmers Preferences Towards Public and Private Sector Seeds in Karnataka*

PRASAD PATIL, S.B. MAHAJANASHETTI, H. BASAVARAJ AND H. S. VIJAYAKUMAR

Department of Agricultural Marketing, Co-op and Agribusiness Management
College of Agriculture, Dharwad - 580 005

(Received: October, 2005)

Abstract: The present study ascertained farmers and seed dealers' impressions about the public and private sector seed companies in Karnataka. Conjoint analysis was employed to examine farmers' seed preferences, using seed price, brand name, timing of seed availability and mode of payment as the seed attributes. A large number of farmers felt that the public sector seeds were reasonably priced and possessed good quality. However, they complained in general of poor services of the public sector. The farmers assigned maximum importance to price, followed by the timing of seed availability and the brand name in their seed buying decisions.

Introduction

Seeds are often regarded as the vehicle of production for which other inputs like fertilizer, water etc. act as fuel. Karnataka is one of the pioneer states in seed production in the country. A large number of seed firms are engaged in production and marketing of quality seeds in the state. The establishment of Karnataka State Agro-Seeds Corporation Ltd. in 1973 as a subsidiary organization of Karnataka Agro-Industries Corporation Ltd. was an important step towards the development of seeds industry in the state. This subsidiary organization was later changed to an independent corporation viz., Karnataka State Seeds Corporation Ltd. (K.S.S.C. Ltd.) with the financial assistance of the World Bank. Since its inception, the corporation has been playing a pivotal role in the production and distribution of quality seeds in the public sector. The spatial coverage of the corporation has also widened over years with the number of its branches increasing to 46 in 2002-03 from 13 in 1978-79. Further, the corporation could increase its business turnover from Rs.580.08 lakhs in 1978-79 to Rs.1,137.68 lakhs in 2001-02.

With several seed companies entering the private sector in recent times, the supply of certified seeds, however, has not remained the monopoly of the Government any more (Kunnal and Shankar Murthy, 1994; Ramaswami et al., 2002). As such, it would be interesting to ascertain farmers' knowledge about the commercial seeds and varieties of the important crops available both in the public and the private sectors (henceforth, the term 'public sector', wherever used, refers to 'K.S.S.C. Ltd.'). The paper also attempts to elicit farmers' opinions about the seeds and services offered by both the sectors, and analyze their preferences. Such an effort would help the seed companies formulate their seed marketing strategies.

Dharwad is an important agricultural district of Karnataka, where a wide range of crops are grown. A large quantity of certified seeds are purchased by the farmers in the district round the year from both the public and the private sectors. Hence, in the present study, the above issues of farmers' attitude towards public and private sector seeds were examined purposively with respect to Dharwad district. However, the

*Part of MBA thesis submitted by the senior author to the University of Agricultural Sciences, Dharwad - 580 005

findings of the study could be generalized to the state as a whole, since the cropping practices and the network of seed suppliers in the district are representative of the major parts of the state. The specific objectives of the present study were to examine farmers' knowledge about commercial seeds and varieties in the public and the private sectors, to document the extent of use of seeds supplied by the public and private sector companies, to elicit farmers' and dealers' opinions about the seeds and services provided by the public and private sectors, and to analyze farmers' preferences for seed attributes in their seed purchasing decisions.

Material and Methods

In keeping with the objectives, the study considered only those crops for which both public and private sectors supplied seeds (for example, vegetable crops were excluded since the public sector does not supply vegetable seeds). Specifically, the crops considered in the study were cotton, jowar and bengal gram as these three crops accounted for more than 50 per cent of the total seed turn over of the public sector. Further, the seeds of these crops had alternative sources of supply through the private sector. Having decided on the crops, a multi-stage purposive sampling procedure was followed for selecting the farmers to ascertain their impressions about the seeds supplied by the two sectors.

In the first stage, three taluks of Dharwad district viz., Dharwad, Kalaghatagi and Navalgund were selected as the above three crops were extensively cultivated in these taluks. In the second stage, two villages were selected from each study taluk based on the extent of area under the crops. In the third and the final stage, a list of the farmers growing at least one of the three crops was prepared for each village with the help of respective village accountants. Using these lists, 18 farmers were selected from each village such that each one of them grew at least

one crop, and at least 50 per cent of them (i.e., at least 9 farmers) grew each study crop. This resulted in a total sample size of 108 farmers.

In addition, 15 seed dealers were randomly selected from each taluk leading to a sample size of 45 dealers, with a view to ascertaining their impressions regarding the public and private sector seeds.

This study has made use of the primary data. The information on the seed brands used (Private brand names are not revealed here for the sake of confidentiality, and are instead referred to as B₁, B₂, B₃ etc.), seed prices, perceptions about the quality of the brands in the public and the private sectors, perceived risks in the use of public and private brands etc. was collected from the farmers with the help of well structured schedules. In addition, information was also collected from the farmers on the ranks they would assign to various combinations of seed attributes for use in the conjoint analysis described below. Further, dealers' views regarding the seed quality, prices, demand, farmers' trust etc. were also ascertained with respect to the public and private sector seeds.

As for the analytical techniques, a simple tabular approach was followed to analyze the views expressed by the farmers and the dealers regarding the seeds supplied by the public and the private sectors. Farmers' preferences for seed attributes were studied using conjoint analysis (Luce and Tukey, 1964; Johnson, 1974). An important factor that can influence the seed purchasing decisions of the farmers is 'price'. This factor can play a significant role especially in respect of expensive seeds of high value commercial crops. As such, it was intended in this study to specifically select high value crops for analyzing the farmers' preferences for seed attributes including price. However, cotton was the only such crop in respect of which, seeds were supplied both by the public and private sectors in the state. Thus, the study purposely

A Conjoint Analysis.

considered cotton seeds for conjoint analysis for measuring the extent of farmers' preferences for the attributes.

The attributes of cotton seeds considered important in farmers' seed-purchase decisions were finalized after several rounds of consultations with some experienced farmers, dealers and the Marketing Manager of K.S.S.C. Ltd., Dharwad. The attributes finally considered included: (i) *Price of the Seeds* for the reasons mentioned above (ii) *Brand Name* since the overall image of the brands is an important driving force behind the purchases) (iii) *Mode of Payment* since a large number of growers are small and marginal farmers, who might look forward to credit facilities, and (iv) *Timing of Seed Availability* since farmers need seeds in time, when the land is ready for sowing after requisite rainfall is received (Singh, 1998). It may be noted that farmers are very much concerned about the germination percentage of the seeds they purchase. However, this attribute was not considered in the analysis since the seed packages show only the minimum assured germination percentage, and any shortfalls can be realized only after seed is sown. Thus, we assumed that farmers' satisfaction/dissatisfaction, if any, with respect to the germination percentages of certain brands would be reflected in their preference for the attribute 'brand name'.

The discussions with the above groups also provided input for determining the levels of

each of the above attributes for conjoint analysis. In respect of the attribute 'price of the seeds', three levels were considered. They were Rs.250, Rs.300 and Rs.350 per Kg. of seeds. These levels were arrived at keeping in view the range of prices in the market for cotton seeds in the public and the private sectors. With respect to the attribute 'brand name', three seed brands viz., K.S.S.C. Ltd., and two private brands (labeled only as B₁ and B₂ for the sake of confidentiality), which were most popular private brands of cotton seeds in the study area, were considered. For the attribute 'mode of payment', the levels considered were: credit and cash payment. Finally, for the attribute 'timing of seed availability', two situations viz., 'timely and untimely availability' were considered.

The different levels of the seed attributes mentioned above resulted in a total of 36 (= 3 x 3 x 2 x 2) combinations to be ranked from 1st to 36th by each of the cotton growers, who were found to be 75 in number in the selected sample of 108 farmers. However, this huge ranking task would have been confusing for the respondents. Thus, we avoided the use of fully crossed factorial design, following the common practice in the studies involving conjoint analysis. Instead, a main-effects model was tested with a fractional factorial design reducing the number of the combinations to be ranked by each respondent to 12 from 36.

Table 1. Use of public and private sector seeds by the farmers

Sl. No.	Seed brand (Private brands denoted as B ₁ , B ₂ , B ₃ etc. for confidentiality)	Percentage of Farmers using the brand
1	K.S.S.C. Ltd.	68.00
2	B ₁	44.44
3	B ₂	32.40
4	B ₃	15.74
5	B ₄	12.96
6	B ₅	7.40
7	B ₆	8.33
8	Other brands collectively labeled as B ₇	5.55

Results and Discussion

The data presented in table 1 presents the percentages of the farmers, who were using the seeds supplied by the public and private sectors. As the table reveals, the proportion of the farmers using the public sector seeds was the maximum (68 per cent). The top two private brands (B_1 and B_2) were used by 44 per cent and 32 per cent of respondents respectively. The other private brands were used by less than 15 per cent of the farmers.

The results of table 2 present the impressions of the farmers regarding the public sector seeds in comparison with the seeds of the private companies. A majority of the respondents (55 per cent) opined that the seeds supplied by the public sector were reasonably priced. Around 27 per cent of them even felt that the public sector seeds were in general less expensive than the seeds of the private companies. The remaining small fraction of the respondents felt that they were more expensive.

As far as the seed quality was concerned, almost 94 per cent of the respondents ranked

the public sector seeds higher than the private company seeds. In line with this impression, 60 per cent of the respondents considered public sector seeds less risky in general compared to private company seeds. Around 31 per cent of them even mentioned that there was no risk in using the seed corporation's seeds. Only a small fraction (9 per cent) of the respondents said that using K.S.S.C. seeds involved higher risk.

A large segment of the respondents (87 per cent) considered the services provided by the public sector seed supplier less prompt compared to the services offered by the private companies. However, the plus points of the public sector seeds with respect to price, quality and risk outweighed the minus points with respect the services offered. This was reflected in the fact that as many as 83 per cent of the respondents said that they were satisfied with the K.S.S.C. seeds on the whole.

The data of table 3 reveals the dealers' impressions regarding the K.S.S.C. Ltd. and its seeds. As many as 82 per cent of the dealers

Table 2. Farmers impressions regarding K.S.S.C. Ltd. seeds in relation to private company seeds

S. No.	Particulars of Impression	Percentage* of Farmers Having the Impression
1	Price of K.S.S.C. seeds:	
	(i) Cheaper	26.85
	(ii) Costlier	17.59
	(iii) Reasonably priced	55.56
2	Quality of K.S.S.C. seeds:	
	(i) Poorer	6.48
	(ii) Better	93.52
3	Risk perception about K.S.S.C. Seeds:	
	(i) Less risky	60.18
	(ii) More risky	9.26
	(iii) Risk free	30.56
4	Services by K.S.S.C. Ltd:	
	(i) Prompt	12.97
	(ii) Less prompt	87.03
5	Overall Satisfaction with K.S.S.C. seeds:	
	(i) Satisfied	83.33
	(ii) Not satisfied	16.67

* Percentage of a total of 108 farmers

A Conjoint Analysis.

Table 3. Dealers impressions regarding the K.S.S.C. Ltd.

S. No.	Particulars of impression	Percentage* of dealers having the Impression
1	Common complaints from the Users of seeds of K.S.S.C. Ltd:	
	(i) Germination problems	82.22
	(ii) Admixture problems	13.33
	(iii) No complaints Received	4.44
2	Response/ no response of K.S.S.C. Ltd. in Respect of genuine complaints	
	(i) Responds	93.33
	(ii) Doesn't Respond	6.67
3	Who Responds to complaints Early?	
	(i) K.S.S.C. Ltd.	4.45
	(ii) Private Companies	84.44
	(iii) Both	11.11
4	Farmers trust in K.S.S.C. Ltd. seeds:	
	(i) High	26.67
	(ii) Moderate	44.44
	(iii) Low	28.89
5	Overall working of the K.S.S.C. Ltd:	
	(i) Better than private companies	13.33
	(ii) Comparable with private companies	20.00
	(iii) Inferior to private companies	66.67

*Percentage of a total of 45 dealers

mentioned that the common complaints they received from the users of the public sector seeds related to unsatisfactory germination. Complaints of admixture were received by only 13 per cent of the dealers. The rest of the dealers did not receive any complaints. Regarding the handling of farmers' complaints, as many as 93 per cent of the dealers opined that K.S.S.C. Ltd. was responsive to farmers' grievances. However, a large majority of the dealers (84 per cent) said that the seed corporation lagged behind the private companies as far as the quickness of the action was concerned. This observation was in agreement with the majority opinion of the farmers that the corporation was not prompt in its services to the farmers.

About five per cent dealers mentioned that the seed corporation was in fact faster in its action than the private sector, while around 11 per cent of the dealers were of the view that both the public and private sector seed suppliers would take equal time to attend to the complaints.

Despite the majority opinion that K.S.S.C. Ltd. responded late to the farmers' problems, only 29 per cent of the dealers felt that farmers' trust in the public sector seeds was low. Around 44 per cent of the dealers opined that farmers' trust was moderate, while the remaining 27 per cent felt that the trust was in fact high. This observation of the dealers was in agreement with the appreciation of the quality of public sector seeds by a large majority of the farmers, and their overall satisfaction with the corporation's seeds.

On the whole, however, a majority of the dealers (67 per cent) considered the working of the K.S.S.C. Ltd. inferior to the working of private companies. Only, around 13 per cent dealers were of the opinion that the seed corporation was functioning better than the private companies.

The data of table 4 presents the combinations of seed attributes in the fractional factorial design used for conjoint analysis. As the table reveals this statistical design reduced

the number of attribute combinations to 12 from 36, which made ranking a manageable task for the respondents.

The data of table 5 presents the results of conjoint analysis carried out in respect of cotton seeds. As revealed by the table, price of the seed had the maximum relative importance of 35.82 per cent, and mode of payment had the least relative importance of 0.88 per cent in farmers' seed buying decisions. Timing of seed availability and brand name were found to be the second and the third important factors in farmers' decisions, with the relative importance of 34.15 per cent and 29.15 per cent, respectively.

As suggested by the utility coefficients, B₂ - a particular private brand of cotton seeds (utility coefficient of 0.4695) - priced around Rs.300 per Kg. (utility coefficient of 0.3472) and characterized by timely availability (utility coefficient of 0.4833) would be preferred most by cotton growers. On the other hand, B₁, the other private brand (utility coefficient of -0.3556) priced around Rs.320 per Kg. (utility coefficient of -0.6666) and characterized by untimely availability (utility coefficient of -0.4833) would be preferred least.

To conclude, the analysis showed that a majority of the farmers used mainly the public

sector seeds brand i.e., K.S.S.C. Ltd. followed by some important private brands, of which two particular brands, B₁ and B₂ were prominent. Though other seed brands were also used by the farmers, the proportion of such farmers was not very high. A majority of the farmers preferred public sector seeds to private brands from the viewpoint of price, seed quality and the overall risk involved. However, a large majority of farmers were of the opinion that the services of the K.S.S.C. Ltd. were not prompt. This particular view of the farmers was endorsed by the seed dealers. Though a majority of the dealers mentioned that the seed corporation did respond to the farmers' complaints, they stated, at the same time, that the corporation's response was delayed one when compared to the response from the private companies. Further, a majority of the dealers rated the overall working of the corporation poorer in comparison with the working of the private companies. It would, thus, be in fitness of the things for the corporation to look into the lacunas in its operations, and enhance the speed and effectiveness of its services to the customers.

The results of the conjoint analysis suggested that farmers were least bothered about whether the seeds were available on credit basis or not. The top two considerations of the farmers

Table 4. Combinations of seed attributes used in conjoint analysis

Combination		Seed Attributes		
No.	Brand name	Price (Rs./Kg.)	Mode of payment	Timing of Seed availability
1	K.S.S.C. Ltd.	300	Credit	Untimely
2	B ₁	320	Cash	Untimely
3	K.S.S.C. Ltd.	250	Cash	Timely
4	B ₂	250	Credit	Untimely
5	B ₁	300	Credit	Timely
6	B ₁	250	Credit	Timely
7	B ₂	300	Cash	Timely
8	K.S.S.C. Ltd.	320	Credit	Timely
9	B ₂	320	Credit	Timely
10	B ₁	250	Cash	Untimely
11	B ₂	300	Cash	Untimely
12	K.S.S.C. Ltd.	320	Cash	Untimely

A Conjoint Analysis.

Table 5. Relative importance of attributes of cotton seeds

Attribute	Attribute Level	Utilities	Relative Importance of the Attribute
Price of seeds (Rs. per Kg.)	(i) 320	-0.6666	35.82
	(ii) 300	0.3472	
	(iii) 250	0.3194	
Timing of seed availability	(i) Timely	0.4833	34.15
	(ii) Untimely	-0.4833	
Brand name	(i) K.S.S.C. Ltd.	-0.1139	29.15
	(ii) B ₁	-0.3556	
	(iii) B ₂	0.4695	
Mode of payment	(i) With Credit	-0.1250	0.88
	(ii) Without Credit	0.1250	
Pearson's R = 0.76	Significance = 0.0080		

in their seed buying decisions were 'price and timely availability'. Thus, the seed companies, as a part of their overall marketing strategies,

would do well to keep their prices competitive and supply the seeds well in time when the land is ready for sowing after requisite rainfall.

References

- JOHNSON, R.M., 1974, Tradeoff analysis of consumer values. *Journal of Marketing Research*, **11**(1): 121-127.
- KUNNAL, L.B. AND H.G. SHANKARA MURTHY, 1994, Seed market in Karnataka: A market share analysis. *Bihar Journal of Agricultural Marketing*, **2** (4): 347-357.
- LUCE, R.D. AND J.W. TUKEY, 1964, Simultaneous conjoint measurement: A new type of fundamental measurement. *Journal of Marketing Psychology*, **1**(1): 1-27.
- RAMASWAMY BHARAT, C.E. PRAY, T. KELLY AND B. RAMASWAMY, 2002, Dissemination of private hybrids and crop yields in the semiarid tropics of India. *Indian Journal of Agricultural Economics*, **57** (1): 39-51.
- SINGH RAMENDRA, 1998, Relative extension education and fertilizer promotion in changing market scenario. *Fertilizer News*, **43**(9): 53-57.