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Millers preference towards technological attributes in pigeonpea in N-E Karnataka

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ABSTRACT

Red gram or pigeonpea, *Cajanus cajan* (L) Millsp is one of the major pulse crops of tropics and sub-tropics and owed with several unique characters.The major part of pulse produced in India is converted into Dal. Many products are made from whole or de-husked pulses. Pigeonpea undergoes processing before it is taken for consumption. It is important to elicit the preference of the Dal millers so that it indirectly increases the price of the farmers' produce. Despite release of several improved varieties of pigeonpea millers preference has been concentrated towards certain varieties. The current study was aimed at identifying and evaluating technological attributes of pigeonpea preferred by millers. Data were collected from 30 millers from Kalaburgi, Karnataka district through simple random sampling procedure. The conjoint analysis model was employed to analyse attributes preferred by millers. The results suggested that important traits preferred by the millers were high recovery percentage, low moisture content, medium seed coat and good colour.

Keywords: Attributes; miller; pigeonpea; quality; varietal preference

INTRODUCTION

Red gram or pigeonpea, *Cajanus cajan* (L) Millsp is one of the major pulse crops of tropics and sub-tropics and owed with several unique characters. It ranks second among pulse crops next to Bengal gram. Pigeonpea is of dietary importance with seed protein content of about 21 per cent which is highest among legumes. The major part of pulse produced in India is converted into Dal. Many products are made from whole or de-husked pulses. Roasted pulses, pulses flour, Sattu, sprouts, fermented product etc are quite commonly produced in domestic market on commercial basis to cater to the requirements of consumer. For most of the pulse-based products dehusking is an essential operation. It improves textural and culinary properties of the grain.

Pulse processing industry is one of the major agro-processing industries in India. Out of the total production of 13.19 MT of pulses in the country 75 per cent are processed by Dal mills. There were about 2000 Dal mills in the country in 1972. The number grew steadily to 6000 units in 1982, 12000 in 1995 and 14000 during 1999-2012.

In Karnataka pigeonpea was grown in an area of 6.66 lakh hectares with a production of 4.69 lakh tonnes during 2012-13. It is largely grown in the northern part of the state especially in Kalaburagi district which is called as 'Pulse Bowl' of Karnataka. Kalaburagi district occupied an area of 370523 hectares with a production of 180222 tonnes during 2012-13 (Anon 2012).

METHODOLOGY

Sample millers were selected randomly from the Kalaburagi and Jewargi Taluks of Kalaburagi district. Around 300 Dal processing units were established in Kalaburagi district and majority (254) of them were in Kalaburagi city. Therefore selection of

millers was confined to Kalaburagi city only and 30 millers were selected randomly for analysis from Kalaburagi district.

Analytical tools

Conjoint analysis: It is a technique used in assessing consumers' value judgments. Hence in the present study it was used to measure the millers' preference for the pigeonpea quality/varietal attributes. Of late conjoint analysis is finding increasing application in the field of market research and wider management decision-making.

One of the important requirements for conjoint analysis is the identification of critical attributes to describe the preferences for pigeonpea varieties and the specific and feasible levels of these attributes. On the basis of the objective attributes and respective levels with orthogonal variables 18 cards were developed. The respondents were first asked to rank the set of profiles or cards according to their preference. On each of these profiles all the factors of interest were represented and a different combination of factor levels appeared. The task of respondents was to rank each profile from the most to the least preferred. From these rankings or scores conjoint analysis derived utility scores for each factor level. These utility scores from analogous to regression coefficients are called part-worths and can be used to find the relative importance of each factor.

What pigeonpea attributes were important or unimportant to the millers was analyzed using conjoint analysis. In the preference of pigeonpea level the attributes most or least desirable to the millers are of crucial importance. The attributes and levels resulted in 18 profile solutions. Since the number of all possible combinations of these 5 attributes was too large for evaluation computer software package SPSS (statistical package for social sciences) was employed to select a subset of 18 pigeonpea profiles which represented the most likely ones. Each profile was described on a separate card called plan card. While interviewing all respondents were shown a randomly-mixed set of 18 plan cards and were asked to rank them accordingly to their own perception. The ranks provided by them to 18 cards were noted down.

For each attribute/respondent the part-worth as well as relative importance of each attribute were estimated using conjoint analysis.

The additive conjoint model was used instead of other forms like the interactive and the multiplicative models. The model was formulated as:

$$Y = \sum_{i=1}^{n} \sum_{j=1}^{m} V_{ij} X_{ij}$$

where Y= The consumers' overall evaluation of the product alternative, V_{ij}= Part-worth associated with 'j' (1,2,3, ……m) of attributes 'i' (1,2, ……,n), X_{ij}= Dummy variable representing the preference of the j^{th} level of i^{th} attribute

RESULTS

Technological attributes of pigeonpea preferred by Dal millers: The results presented in Table 1 reveal that the Dal recovery rate was found to be most important (100%) followed by moisture content (83.33%), seed size (83.33%) and thickness of seed coat (73.33%). Test weight and percentage of immature seeds were found to be the least important attributes.

Miller's decision to purchase a particular quality/variety of pigeonpea variety is largely influenced by its attributes like seed shape, moisture, seed coat, Dal, price, recovery etc.

For each respondent the part-worth was estimated using OLS regression analysis. The fit of the additive model to the individual data was good. The Pearson's rank correlation test value (0.892 significant at 1%) signified strong confidence in the suitability of the additive model. Table 2 reveals that among all the attributes studied moisture and recovery attributes of the pigeonpea variety were most important in deciding millers' preference towards particular quality/variety in market during purchasing. Moisture content of the grain was found to be of greatest influence accounting for 32.65 per cent of relative importance. Grains having 8-10 per cent moisture were most preferred (utility-3.000) and 10-12 per cent moisture were least preferred (utility- 3.000). Price of Dal had the least importance of 4.08 per cent. Recovery percentage as an attribute was by far the most important attribute to explain the preference of millers. Most of the millers preferred variety having recovery percentage of more than 72 per cent as it had direct relationship with the returns they got.

Table 1. Technological attributes of pigeon pea preferred by the Dal millers

Attribute	Respondent	
	Number	Per cent
Dal recovery	30	100.00
Moisture content of seed	25	83.33
Seed size	25	83.33
Seed coat	22	73.33
Seed colour	19	63.33
Purchase price	19	63.33
Seed shape	16	53.33
Foreign matter content	16	53.33
Test weight of seeds	11	36.67
Percentage of immature seeds	6	20.00

Table 2. Attributes of pigeon pea most preferred by the millers

Attribute	Level	Utility	Relative importance (%)
Seed shape	Round	1.2500	13.61
	Oval	-1.2500	
Moisture content	10-12%	-3.000	32.65
	8-10%	3.000	
Seed coat	Thick	1.1667	17.01
	Medium	1.9583	
	Thin	-0.7917	
Dal hardness	Semi-hard	1.3750	14.97
	Hard	-1.3750	
Price	Rs 5000-6000	0.1667	4.08
	Rs 4500-5000	-0.4583	
	Rs 4000-4500	0.2917	
Recovery	65-72%	-1.6250	17.69
	>72%	1.6250	

Seed coat as an attribute received more importance (17.01%) to the total preference. Medium seed coat was most preferred (utility 1.95) because thick seed coat reduces the recovery percentage and thin seed coat does not get detached easily. Millers expressed a preference for flattish round pigeonpea that does not break on the roller and the quantity of second quality Dal is reduced. Millers gave least importance to price as an attribute. The results are in line with those of Rao et al (1991).

CONCLUSION

Millers' preference of pigeonpea variety based on varietal attributes showed that among attributes preference was heavily tilted towards recovery percentage, medium seed coat, less moisture content in the seed, semi-hardness, colour of the seed etc. Thus these attributes need to be given more consideration in breeding programmes.

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