

Preferred traits in pigeonpea production in India

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ABSTRACT

The study was carried out to assess the preferred trait of pigeonpea production in India. For this purpose, the surveys were conducted in district Akola of Maharashtra state, which was representative of the main agro-ecological zone of India. Three treatment villages were selected randomly *i.e.* one from Akola taluka and two from Murtizapur talukas. Thus, the sample sizes of 135 farmers were selected, of which, 90 farmers from adopted village and 45 farmers from control villages. The result of the present study was observed to identify the preferred trait of Maroti, Asha and Ganesh varieties of pigeonpea by using Garrett's ranking Technique. Preferred trait observed in pigeonpea production was high yield, drought resistance and short duration. Pigeonpea had preferred trait in consumption also, like better taste, less cooking time and also Quantity and durability of fodder in pigeonpea. Because of all these preferred traits Pigeonpea is a most important pulse crop in India. Thus, it is suggested that, it is necessary to enhance the area under pigeonpea production.

INTRODUCTION

Pigeonpea [*Cajanus cajan* (L.) willsp.] is a tropical grain legume grown mainly in India. Though largely considered an orphan crop, pigeonpea has a huge untapped potential for improvement both in quantity and quality of production in Africa. More than any other legume adapted to the region, pigeonpea uniquely combines optimal nutritional profiles, high tolerance to environmental stresses, high biomass productivity and most nutrient and moisture contributions to the soil. Pigeonpea production is highest in India (Johansen *et al.*, 1993). About 90% of the global pigeonpea area (4.4 M ha) is in Asia about 86% in India (Siambi *et al.*, 1992). In India, most of the farmers plant pigeonpea in *Kharif* season generally intercropped with soybean, cotton, sorghum, greengram, sunflower and black gram (Omanga *et al.*, 1996). Africa, Latin America, and the Caribbean region, India is probably the primary centre of origin of pigeonpea.

Pigeonpea is the most important food grain legume in India as a multiple purpose drought-tolerant crop and provides many benefits to resources-poor families: Its green pods and seeds are consumed as a vegetable, and the dry grains are cooked whole or after dehulling (as dhal). The foliage is used as fodder, and the dry sticks are used for fencing, thatching, and as firewood. It fixes atmospheric nitrogen, and the extensive leaf fall adds

organic matter to the soil. Rarely does the plant need to be inoculated because it can nodulate on *Rhizobium* naturally present in most soils (Faris, 1983). Dry grain is also used for animal feed. Because of the ability of pigeonpea roots to penetrate hard soils, it is used in soil conservation in rocky mountain slopes. Therefore, the present study has been made to assess the preferred trait of pigeonpea production in India.

METHODOLOGY

In India, area under pigeonpea is highest in Akola district of Maharashtra. Therefore, for the present study Akola district was selected purposively in Maharashtra state. In Akola district, Akola and Murtizapur talukas were selected. Three treatment villages were selected randomly *i.e.* one from Akola taluka and two from Murtizapur talukas. Thus, the sample sizes of 135 farmers were selected, of which, 90 farmers from adopted village and 45 farmers from control village's. The details are given below.

Target domain:

Sources of data collection:

The study is based on primary data and secondary data collected from the public records, journals and web portals. The primary data were collected from the district socio-economic surveys *i.e.* Akola district through

Key words :

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District	Taluka	Adopted villages		Control villages		Total
		Name	Sample size	Name	Sample size	
Akola	Akola	Agar	30	Ugwa	15	45
	Murtizapur	Kanzara	30	Kinkheda	15	45
		Sirso	30	Jitapur	15	45
Total			90	45	135	

personal interview method using a well-designed and pre-tested questionnaire. The collected data were analyzed by using the weighted average, count, percentage analysis and Garrett's ranking method.

Garrett's ranking method:

To find out the most significant factors, which influence the respondents while arranging tour, Garrett's ranking technique was used. As per this method, respondents have been asked to assign the rank for all the factors and outcome of such ranking have been converted into score value with the help of the following formula:

$$\text{Per cent position} = \frac{100 (\text{Rij} - 0.50)}{\text{Nj}}$$

where,

Rij = Rank given for the ith factor by the jth respondents

Nj = Number of factors ranked by the jth respondents.

RESULTS AND DISCUSSION

It is seen from Table 1 that, most of the farmers in

Table 1: Area under different varieties of pigeonpea in Kharif season (figure in per cent)

Varieties	Adopted	Control	Overall
Maroti	5.44	5.29	5.39
Asha	2.79	6.35	3.98
Ganesh	2.5	00	1.67

selected samples of Adopted villages used Maroti, Asha and Ganesh varieties of pigeonpea while in case of control village, farmers grew only Maroti and Asha varieties of pigeonpea. At an overall level farmers grew 5.39 per cent area under Maroti variety, 3.98 per cent area under Asha and 1.67 per cent area under Ganesh variety of pigeonpea.

Garret scores for preferred traits (production):

Garret scores for preferred traits are presented in Table 2.

Table 2 shows that at an overall level, the preferred traits of pigeonpea production by using Garret score technique was observed high yield which was most important trait as yield which plays important role in production followed by drought resistant. It was also seen in Table 2 that third preferred trait was short duration followed by pest resistance and disease resistance in the selected sample as a whole.

Garret scores for preferred traits (consumption):

Garret scores for preferred traits are presented in Table 3.

Table 3 reveals that sample as a whole, better taste was observed to most important trait with regards to consumption. Similarly, second preferred trait was less

Table 2 : Garrett scores for preferred traits in cultivars of pigeonpea

Traits	Selected varieties in										Overall	
	Adopted villages					Control villages						
	Maroti		Asha		Ganesh	Maroti		Asha		GS	R	
	GS	R	GS	R	GS	R	GS	R	GS	R	GS	R
HY	58.68	1	58.83	1	69	1	64.32	1	69	1	60.72	1
SD	22.23	4	20.75	4	50	2	27.45	3	50	2	24.38	3
DRR	32.68	2	28.17	2	31	3	34.09	2	0	0	32.23	2
PR	22.74	3	26.00	3	0	0	17.09	4	0	0	20.72	4
DIR	11.68	5	11.92	5	0	0	10.77	5	0	0	11.15	5
FCS	4.19	7	4.83	6	0	0	2.82	6	31	3	4.18	6
ISF	5.06	6	3.58	7	0	0	2.64	8	0	0	4.05	7
MRP	1.84	8	0	0	0	0	2.77	7	0	0	1.93	8

Note : GS=Garrett score

R=Rank

HY=High yield

PR=Pest resistance

ISF=Improvement soil fertility

SD=Short duration

DIR=Disease resistance

MRP=More recovery/shelling per cent

DRR=Drought resistance

FCS=Fitness into cropping system

cooking time and third was high keeping quality in storage point of view.

Garret scores for preferred traits (fodder):

Garret scores for preferred traits are presented in Table 4

Table 4 it was found that farmers preferred rank first in quantity of fodder followed by more durability of fodder, palatability, respectively in pigeonpea fodder.

Garret scores for preferred traits (marketing):

Garret scores for preferred traits are presented in Table 5

Table 5 depicts the sample as whole marketing of preferred traits of pigeonpea cultivars was observed to high demand due to inverse relationship between demand and supply of pigeonpea which was fetched higher price

and price fluctuations. It was also observed of bigger grain size in marketing of pigeonpea in the selected samples.

Conclusions:

– The result of the present study indicted that Maroti, Asha and Ganesh are most ruling varieties of Maharashtra state.

– Garrett’s ranking technique. has been used for identify the preferred trait of pigeonpea

– Preferred trait observed in pigeonpea production was high yield, drought resistant and short duration.

– Pigeonpea had preferred trait in consumption also, like better test, less cooking time and also quantity and durability of fodder in pigeonpea.

– It is necessary to focus on these preferred traits of pigeonpea to enhance the production of pigeonpea.

– Because of all these preferred traits it is a most

Table 3 : Garrett scores for preferred traits (consumption) in pigeonpea cultivars

Trait	Selected varieties in										Overall	
	Adopted					Control						
	Maroti		Asha		Ganesh		Maroti		Asha		GS	R
	GS	R	GS	R	GS	R	GS	R	GS	R	GS	R
BT	55.31	1	59	1	0		53.61	1	31	3	54.33	1
LCT	45.23	2	39.50	3	37	2	48.43	2	50	2	45.75	2
HKQ	42.31	3	47.33	2	63	1	44.55	3	69	1	44.02	3
OTH	1.95	4	0		0		0		0		1.11	4

*Note: GS=Garrett score
LCT=Less cooking time

BT=Better taste
HKQ=High keeping quality

OTH=Others

Table 4 : Garrett scores for preferred traits (fodder) in pigeonpea

Trait	Selected varieties in										Overall	
	Adopted					Control						
	Maroti		Asha		Ganesh		Maroti		Asha		GS	R
	GS	R	GS	R	GS	R	GS	R	GS	R	GS	R
MFQ	49.29	1	60.08	1	37	2	53.61	1	31	3	51.26	1
PQT	44.71	3	40.00	3	0		48.43	2	50	2	45.22	3
MDF	49.26	2	41.58	2	63	1	44.55	3	69	1	47.47	2
OTH	0.90	4	0.00		0		0.00		0.00		0.51	4

*Note: GS=Garrett score
MFQ=More fodder quantity

R=Rank
PQT=Palatability (Quality/Taste) OTH=Others

MDF=More durability of fodder

Table 4 : Garrett Scores for preferred traits (marketing) in pigeonpea cultivars

Trait	Selected varieties in										Overall	
	Adopted					Control						
	Maroti		Asha		Ganesh		Maroti		Asha		GS	R
	GS	R	GS	R	GS	R	GS	R	GS	R	GS	R
HD	55.14	1	41.75	1	69	1	53.34	1	50	2	53.40	1
FHP	33.17	3	33.67	3	0		44.64	2	69	1	37.15	2
LPF	33.27	2	30.75	4	31	3	40.55	3	31	3	35.31	3
BGS	28.66	4	39.67	2	50	2	11.48	4	0		23.90	4

*Note: GS =Garrett score, R=rank, LPF=Low price fluctuations
BGS=Bigger grain size, HD=High demand, FHP=Fetching higher price

important pulse crop in India.

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