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Performance of Different Hybrids and Varieties of Redgram under Central Dry Zone of Karnataka, India

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A B S T R A C T

Pigeonpea (*Cajanus cajan* L.) is an important multipurpose pulse legume in the tropics and subtropics. The global production of pigeon pea is 4.32 million tonnes from an area of 5.32 m ha with a productivity of 813.2 kg/ha. India is the largest producer and consumer of pigeonpea with an area of 3.86 m ha followed by Myanmar. In spite of huge demand and high price the yield barrier is not broken. To overcome the problem of low productivity hybrid technology or the use of hybrids is preferred; which is one of the components to increase the yield. The present investigation comprised of 22 entries sponsored by IIPR, Kanpur was conducted at the Zonal Agricultural and Horticultural Research Station, Hiriyur, Chitradurga district, Karnataka during 2015-16 *kharif* season to study their potentiality with respect to yield trait mainly. Analysis of variance showed significant differences for all the characters. This indicates the existence of sufficient variation for effective selection for the characters in the material under study. The genotypeGRG-2013 recorded higher yield of 1806 kg/ha followed by CRG-2012-25with a yield of 1720kg/ha. It is believed that the hybrid plants are naturally developed at genetic level to produce vigorous plants, in turn greater yields. This is attributed to the interactions among various favorable alleles. The increase in seed yield was due to better synchronization of flowering resulted in increased pod set. The higher yield resulted due to more number of branches, pods per plant as it is one of the important yields attributing character.

Keywords

Redgram, Hybrid, Central dry zone.

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Introduction

Pigeonpea (*Cajanus cajan* L.) is one of the most important legume crops of India. India contributes to the tune of world's 85% of the total production. Among pulses, pigeonpea *dal* is a staple food across the country and plays an important role in National Economic and Nutritional Security.

The annual production of pigeonpea pulse in India is about three million tonnes; but this quantity is insufficient to meet the domestic needs and hence a considerable amount (about 100,000 t) of pigeonpea is imported each year (http//www.ipga).

To breed high yielding cultivars of pigeonpea breeders running out of various methods primarily recommended for self-pollinated crops (Green *et al.*, 1981) and released number of varieties but without any significant improvement in its productivity, that remained unchanged over the decades at around 600-800 kg/ha.

In coming future also, the issue of yield stagnation is likely to be remain more or less same, until a path breaking technology with exceptionally high yield potential is developed. In this regard, the recent success in developing hybrid breeding technology in pigeonpea (Saxena *et al.*, 2013), the first in the world in any grain legume, has generated a lot of positive opinion and energy among pigeonpea breeders to break down the decades-old productivity barrier.

Materials and Methods

The material for the present study comprised of 22 different entries sponsored by IIPR Kanpur. The seed material was sown in Randomized Complete Block Design with recommended Agronomic and Plant Protection practices were followed during crop growth period to raise a good crop.

The application of recommended dose of fertilizer (25:50:25 NPK kg/ha) applied to the plot. Several yield and yield attributing traits were recorded in pigeonpea.

Each plot consisted 6 rows of 4 m length with inter and intra row spacing of 90 and 25 cm, respectively. To avoid border effect, one border row was planted at each side of the plot and first and last plant from each row was excluded from the plot yield and yield kg/ha was calculated considering net plot area 12.6 m^2.

The Agronomic practices included basal application of Recommended Dose of Fertilisers (RDF), two hand weedings and two irrigations were followed.

Data were recorded on days 50% flowering, Plant height (cm), plant stand at the time of harvesting, Number of primary branches/plant, Number of secondary branches/plant, Number of pods/plant, 100 seed weight (g) and yield (kg/ha). The statistical analysis was performed using AGROBASE GEN-II software.

Results and Discussion

It is believed that the hybrid plants are naturally planned at genetic level to produce vigorous plants, greater yields and maintaining their stability. This is attributed to the interactions among various favourable alleles.

It was noted that pigeonpea hybrid plants start showing hybrid vigour right from the early seedling stage. In comparison to pure lines, the hybrids have higher yield potential (Bharathi and Saxena, 2012; Thakre *et al.*, 2013).

Analysis of variance showed significant differences for all the characters. This indicated the existence of sufficient variation for effective selection for these characters in the material under study (Table 1).

The genotype GRG-2013 recorded higher yield (1806 kg/ha) followed by CRG-2012-25 with a yield (1720kg/ha). Hybrids have more potential and believed that they are naturally programmed at genetic level to produce vigorous plants, greater yields and stability.

The increase in seed yield was due to better synchronization of flowering resulted in increased pod set. The higher yield resulted due to more number of pods per plant as it is one of the important yields attributing character.

Table.1 Analysis of variance for yield and yield attributing characters in different pigeon pea hybrids and varieties

Entries	Yield (kg/ha)	Days to 50% flowering	Plant height (cm)	Number of primary branches /plant	Number of secondary branches /plant	Number of pods /plant	100 seed weight (g)
RVSA 7-15	1380.0	73.0	191.7	11.3	5.0	173.0	12.1
GJP 1406	1470.0	82.0	214.0	10.7	6.7	158.0	12.2
LRG 117	1174.0	81.3	172.0	12.3	4.0	167.0	13.0
TRG 59	1479.0	83.0	169.0	11.3	5.7	100.3	12.0
LRG 170	1273.0	82.3	200.3	13.0	4.7	242.3	11.0
GRG 2013	1806.0	81.7	176.0	11.3	3.3	255.3	11.2
BRG 15-1	1199.0	87.3	213.0	8.7	5.0	93.3	13.7
CRG 2012-30	1498.0	70.7	206.7	12.0	3.3	217.0	10.1
BRG15-2	1220.0	84.0	218.7	12.7	4.3	225.7	15.1
RVSA 7-17	1282.0	81.0	200.0	12.3	5.7	112.3	9.9
GJP 1401	1535.0	81.3	233.3	12.0	4.3	167.7	12.1
BDN 2008-7	1609.0	71.0	203.7	10.0	5.3	133.3	11.8
WRG 242	1030.0	81.0	202.0	12.0	3.3	192.7	11.5
RPS 2007-10	1678.0	71.0	217.3	12.3	4.0	156.7	12.3
CRG 2012-25	1720.0	80.3	212.7	12.3	6.7	235.0	9.4
AKTE 12-02	1512.0	77.3	214.0	11.3	3.7	155.0	11.4
BSMR 243	1678.0	72.3	217.0	12.7	5.0	171.3	11.5
RKPV 4121-02	1053.0	73.0	126.7	10.7	3.7	102.7	10.4
WRG 252	1477.0	74.0	222.7	13.7	3.3	197.3	10.4
ICP 8863 (C)	1444.0	74.7	180.0	10.0	6.0	122.7	9.2
WRP-1 (C)	1400.0	73.7	193.7	12.7	5.0	198.3	10.2
CO 6 (C)	1576.0	76.3	229.7	10.0	6.7	180.3	8.6
SEm±	75.02	0.7	5.52	0.72	0.44	9.78	0.31
CD (0.05P)	232	2	15.77	2.06	1.27	27.91	0.88
CV(%)	10	1.56	4.77	10.77	16.18	9.92	4.74

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