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## Mean performance of ridge gourd parents and hybrids for yield and quality characters

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#### Abstract

The present study carried out using fifteen hybrids developed from the six parents of ridge gourd IC 398599 (P1), IC 308561 (P2), IC 523892 (P3), IC 539714 (P4), Arka Sumeet (P5), Arka Sujat (P6) with standard check (Chitra) for twenty one characters for over a period of three seasons viz., *summer*, *kharif* and *rabi* in 2018 at vegetable block, college of horticulture, Venkataramannagudem, Dr. YSR Horticultural University. Among the total crosses four crosses viz., IC 398599 × Arka Sumeet, IC 398599 × Arka Sujat, IC 523892 × Arka Sumeet and IC 523892 × Arka Sujat showed superior mean performance regarding most characters. Seeds per fruit and seed weight are the important yield attributing characters. Maximum seeds per fruit and seed weight were recorded in IC 523892 × Arka Sumeet. Four hybrids viz., IC 398599 × Arka Sumeet, IC 398599 × Arka Sujat, IC 523892 × Arka Sumeet and IC 523892 × Arka Sujat recorded significantly higher yield per acre (q) than the standard check Chitra (31.14 q). The cross, IC 308561 × IC 539714 recorded high fibre content among all the genotypes. TSS content was significantly highest in the cross IC 398599 × Arka Sujat whereas the genotype IC 398599 × Arka Sumeet recorded high protein content than the standard Check Chitra.

**Keywords:** Ridge gourd, *Luffa acutangula*, mean and performance

#### Introduction

Ridge gourd (*Luffa acutangula* (L.) Roxb.) is one of the most important cucurbitaceous vegetables grown throughout India. It is considered to be the old world species and a native of tropical Africa and South-East Asian region including India. Its chromosome number is  $2n=2x=26$ . Ridge gourd belongs to the family Cucurbitaceae and the genus *Luffa*. The genus derives its name from the product 'loofah' which is used in bathing sponges, door mats, pillows and also for cleaning utensils. The genus includes seven species of which only two are important and commonly cultivated vegetables viz., ridge gourd (*Luffa acutangula* (L.) Roxb.) and sponge gourd (*Luffa cylindrica* L.). It is widely grown in tropical and sub-tropical parts of India. Ridge gourd is a popular vegetable both as spring-summer and rainy season crop and can be grown throughout the year. The tender green or immature fruits are cooked as vegetable and are used in the preparation of chutney and curries. Fruit is demulcent, diuretic and nutritive. The juice of the fresh leaves is dropped into the eyes of children for granular conjunctivitis and also to prevent the eye lids sticking together at nights due to excessive meibomian secretion (Rahman *et al.*, 2008) [10]. The leading countries in gourds production are China, India, Ukraine, USA and Egypt. Gourds are the important vegetables in the human diet especially in India. Every 100 g of the edible portion of ridge gourd contains 0.5 g of fibre, 0.5 percent of protein, 0.34 percent of carbohydrate, 37 mg of carotene, 5.0 mg of vitamin C, 18 mg of calcium and 0.5 mg of Iron (Hazra and Som, 2005) [7]. Ridge gourd is estimated to be cultivated in approximately 9.920 hectares and total production is approximately 3.17 lakh tonnes in India (Anonymous, 2017) [3]. However, most of the cucurbitaceous vegetables are usually cultivated in relatively small areas for local consumption and hence the reliable statistical data on area and production is lacking.

#### Material and Methods

The experiment was carried out in the year 2018 at the college of Horticulture, Venkataramannagudem, Dr YSR Horticultural University. The experimental material comprised six inbred lines IC 398599 (P1), IC 308561 (P2), IC 523892 (P3), IC 539714 (P4), Arka Sumeet (P5), Arka Sujat (P6) and fifteen hybrids developed in half diallel with standard check (Chitra).

These genotypes evaluated in the field with standard check (Chitra) in three seasons *viz.*, summer, *kharif* and *rabi* in 2018. The experiment was laid out in Randomised Block Design with three replications at spacing of 1.0 x 1.2 m. The cultural and management practices were adopted according to the package of practices recommended by Dr. Y.S.R Horticultural University. The observations were recorded from five randomly selected plants in each genotype per replication. The data of individual plants each progeny were recorded 21 characters *viz.*, Days to male flowering, days to female flowering, node of first male flower, node of first female flower, days to 50% male flowering, days to 50% female flowering, number of male flowers per vine, number of female flowers per vine, sex ratio, days to first harvest, days to last harvest, percent fruit set, fruit yield per acre (q), rind thickness (mm), flesh thickness (cm), number of seeds per fruit, hundred seed weight (g), seed yield per fruit (g), fibre content (mg per 100g), TSS (°Brix) and protein (%). The least significant difference test at 5 percent level of probability was used to test the differences among mean values.

### Results and Discussion

The pooled analysis of variance for all characters studied furnished in table 1. Highly significant differences among the genotypes were observed for 21 characters indicating presence of sufficient amount of variability in all the characters studied.

The days to male flowering among the genotypes revealed that the check (Chitra) recorded the lowest days (32.46) preceded by the cross IC 523892 × Arka Sumeet (32.77 days) and the parent Arka Sujat recorded the longest period (42.24). Days to male flowering among the parents varied between 33.75 (IC 539714) and 42.24 (Arka Sujat) and among the hybrids between 32.77 (IC 523892 × Arka Sumeet) to 37.46 (IC 308561 × Arka Sujat) with an overall mean of 35.76 for the genotypes (Table 2).

The parents and hybrids differed significantly for days to female flowering which ranged from 39.44 (IC 523892 × IC 539714) to 53.80 (Arka Sujat) with an overall mean of 43.47. Among the parents, they ranged between 41.89 (IC 539714) to 53.80 (Arka Sujat) (Table 2). The hybrids were in the range of 39.44 (IC 523892 × IC 539714) to 44.80 (Arka Sumeet × Arka Sujat). Among the hybrids, 9 hybrids were earlier to the standard check Chitra (42.95) of which 14 hybrids were recorded significantly superior.

Among all the parents and F1 hybrids tested, the node of first male flower ranged from 4.35 (IC 398599 × IC 523892) to 9.40 (IC 523892 × Arka Sujat) with an overall mean of 6.01. The range was from 4.73 (IC 398599) to 7.80 (Arka Sujat) among the parents and from 4.35 (IC 398599 × IC 523892) to 9.40 (IC 523892 × Arka Sujat) for the hybrids. A total of 8 hybrids flowered on lower node as compared to the check Chitra (5.71) (Table 2).

The observed node of first female flower of genotypes in pooled analysis varied from 6.49 (IC 308561 × IC 539714) to 16.73 (Arka Sujat) with a general mean of 10.60. The parent IC 308561 recorded the lowest node of first female flower (7.53) and Arka Sujat recorded the highest (16.73) (Table 2). The node of first female flower among the hybrids ranged from 6.49 (IC 308561 × IC 539714) to 12.76 (IC 523892 × Arka Sujat) and a total of eleven hybrids have produced their first female flower on a lower node as compared to standard

check Chitra (11.04).

The mean days to 50% male flowering ranged from 44.00 (IC 523892 × IC 539714) to 53.89 (Arka Sujat) with an overall mean of 47.09 (Table 2). Among the parents, they were ranged between 44.77 (IC 539714) and 53.89 (Arka Sujat). The hybrids showed a range of 44.00 (IC 523892 × IC 539714) to 48.75 (IC 308561 × Arka Sujat). Only one hybrid was earlier to the standard check Chitra (44.09) and a total of 7 hybrids were on par with the check for number of days to 50% male flowering.

The observed days to 50% female flowering ranged from 52.29 (IC 523892 × IC 539714) to 64.89 (Arka Sujat) with an overall mean of 55.38. Among the parents, the trait ranged between 53.22 (IC 539714) to 64.89 (Arka Sujat) (Table 2). The hybrids showed a range of 52.29 (IC 523892 × IC 539714) to 56.68 (IC 308561 × IC 539714). The hybrid IC 523892 × IC 539714 (52.29) was the earliest to flower followed by IC 523892 × Arka Sumeet (52.44). A total of 11 hybrids were on par with the standard check Chitra (53.46).

The genotypes differed significantly for number of male flowers per vine and it ranged from 195.64 (IC 398599 × Arka Sumeet) to 487.58 (IC 523892 × IC 539714) with an overall mean of 311.29. A total of four hybrids recorded significantly lower number of male flowers per vine as compared to the check Chitra (262.04) (Table 2).

The genotypes differed significantly for number of female flowers per vine and it ranged from 37.20 (Arka Sujat) to 67.00 (IC 308561) with an overall mean of 51.66. The number of female flowers produced by hybrids were in the range of 37.80 to 65.53 (Table 2). A total of ten hybrids produced relatively higher number of female flowers over the check *i.e.* Chitra (52.00) of which ten were significantly superior.

The mean sex ratio of genotypes varied from 3.04 (IC 523892 × Arka Sumeet) to 9.80 (IC 539714) with a general mean of 6.32 (Table 2). Among the parents IC 523892 recorded the lowest sex ratio (5.82) whereas IC 539714 recorded the highest (9.80). The sex ratio among the hybrids ranged from 3.04 (IC 523892 × Arka Sumeet) to 8.91 (IC 523892 × IC 539714) as compared to standard check Chitra (5.10). A total of 7 hybrids recorded significantly superior lowest sex ratio over the check (5.10).

The significant differences among the genotypes for days to first harvest and it ranged from 46.06 (IC 523892 × IC 539714) to 60.07 (Arka Sujat) with an overall mean of 50.02. The hybrid, IC 523892 × IC 539714 (46.06) was the earliest to produce fruits while another six hybrids were earlier to the standard check Chitra (49.06) (Table 2). A total of 14 hybrids recorded significantly superior earliest to produce fruits over the check.

The genotypes differed significantly for days to last harvest and it ranged from 102.64 (Chitra) to 114.2 (Arka Sujat) with an overall mean of 105.93 (Table 3). Among the hybrids, IC 308561 × Arka Sumeet recorded the highest number of days to last harvest (107.40) while, the check recorded 102.64 days to final harvest.

The observed percent fruit set of genotypes varied from 7.58 (IC 308561 × IC 523892) to 19.60 (IC 308561 × Arka Sujat) with a general mean of 12.28. The parent IC 398599 recorded the highest (14.99) whereas Arka Sumeet recorded the lowest percent fruit set (11.61). The percent fruit set among the hybrids ranged from 7.58 (IC 308561 × IC 523892) to 19.60

(IC 308561 × Arka Sujat) as compared to standard check Chitra (12.49) (Table 3). A total of five hybrids were significantly superior to the standard check.

The mean fruit yield per acre (q) of genotypes was in the range of 17.69 (IC 308561 × IC 523892) to 49.80 (IC 398599 × Arka Sumeet) with a general mean of 31.14. The parent IC 398599 recorded the lowest fruit yield per acre (22.98) whereas IC 308561 recorded the highest yield (38.91) (Table 3). The hybrids were in the range of 17.69 to 49.80 quintal per acre. Among the hybrids, four were significantly superior over standard check Chitra (38.04).

The genotypes differed significantly for rind thickness and it ranged from 2.59 (IC 398599 × IC 308561) to 6.92 (IC 398599) with an overall mean of 4.85 (Table 3). It ranged between 4.98 (Arka Sujat) and 6.92 (IC 398599).

The genotypes differed significantly for flesh thickness and it ranged from 4.43 (Arka Sujat) to 7.03 (IC 523892 × Arka Sumeet) with an overall mean of 5.55 (Table 3). The flesh thickness of parents and hybrids were in the range of 4.43 to 6.71 and 4.55 to 7.03 whereas it was 4.94 for the check Chitra.

The mean number of seeds per fruit over the seasons ranged from 69.34 (IC 308561) to 184.69 (IC 523892 × Arka Sumeet) with a general mean of 121.75. The number of seeds per fruit in parents varied from 69.34 (IC 308561) to 157.33 (IC 539714). Among the hybrids it ranged between 93.26 (Arka Sumeet × Arka Sujat) and 184.69 (IC 523892 × Arka Sumeet). Seven hybrids have recorded significantly higher for number of seeds per fruit than the check Chitra (113.06) (Table 3).

The observed hundred seed weight of genotypes varied from 9.46 (IC 398599 × Arka Sumeet) to 18.75 (Chitra) with a general mean of 13.73 (Table 3). The parent, IC398599 recorded the lowest test weight of 10.98 and IC 308561 recorded the highest test weight of 16.15. The hybrids recorded hundred seed weight from 9.46 (IC 398599 × Arka Sumeet) to 18.07 (IC 523892 × Arka Sumeet) whereas the check Chitra has recorded maximum seed weight (18.75).

The observed seed yield per fruit of genotypes varied from 10.65 (Arka Sumeet × Arka Sujat) to 32.09 (IC 523892 × Arka Sumeet) with a general mean of 16.87. The parent IC 398599 recorded the lowest seed 148 148 yield of 11.27 and IC 523892 recorded the highest seed yield of 23.13. Seed yield of hybrids varied from 10.65 (Arka Sumeet × Arka Sujat) to 32.09 (IC 523892 × Arka Sumeet). Two hybrids recorded higher seed yield than the standard check Chitra

(21.27) (Table 3).

The genotypes differed significantly for fibre content and it ranged from 0.43 (IC 398599 × Arka Sujat) to 1.07 (IC 523892 × IC 539714) with an overall mean of 0.72. Six F1 hybrids were significantly superior to the check Chitra (0.74) (Table 3).

Revealed that, genotypes differed significantly for TSS content and it ranged from 2.59 (IC 523892 × Arka Sumeet) to 4.36 (Arka Sumeet) with an overall mean of 3.50. The cross, IC 398599 × Arka Sujat (4.27) was significantly superior to the check Chitra (3.91) (Table 3).

The mean of genotypes differed significantly for protein and it ranged from 0.15 (IC 398599 × IC 308561) to 0.37 (IC 398599 × Arka Sumeet) with an overall mean of 0.30 (Table 3). The protein content for parents varied from 0.26 (IC 523892) to 0.36 (Arka Sumeet). A total of ten hybrids were significantly superior to the check Chitra (0.27).

Seeds per fruit and seed weight are the important yield attributing characters. Maximum seeds per fruit and seed weight were recorded in IC 523892 × Arka Sumeet while fruit girth was noticed in IC 523892 × Arka Sumeet. Similar differential response for yield and yield attributes in different genotypes of ridge gourd was reported by Singh *et al.* (2002) [13], Ananthan *et al.* (2005) [1], Haumegowda *et al.* (2011) [6] and Krishnamoorthy and Ananthan (2017) [2] in ridge gourd.

Four hybrids *viz.*, IC 398599 × Arka Sumeet, IC 398599 × Arka Sujat, IC 523892 × Arka Sumeet and IC 523892 × Arka Sujat recorded significantly higher yield per acre than the standard check Chitra (38.04 q). These genotypes also recorded more number of seeds per fruit and other important yield contributing characters. These results are in agreement with the findings of Ananthan and Krishnamoorthy (2017) [2], Bhargawa *et al.* (2017) [4] and Varalakshmi and Krishnamurthy (2017) [14] in ridge gourd.

Quality characters are very important in any crop because these characters impart nutritional quality. In the present study, different genotypes showed significant variation in quality characters like fibre content (mg per 100 gram), TSS (OBrix) and protein content (%) of the fruits. The cross, IC 308561 × IC 539714 recorded high fibre content among all the genotypes. TSS content was highest in the cross IC 398599 × Arka Sujat whereas the genotype IC 398599 × Arka Sumeet recorded high protein content. These results are in agreement with the findings of Rahman *et al.* (2008) [10] in cucurbits, Haldhar *et al.* (2015) [5], Kandoliya *et al.* (2016) [8], Rathore *et al.* (2017) [12] and Rani *et al.* (2017) [11] in ridge gourd.

**Table 1:** Pooled Analysis of variance (mean squares) for per se performance in respect of 21 characters in ridge gourd

S. No.	Source of variation/character	Replicates	Treatments	Error
	Degrees of freedom	2	21	42
I	<b>Flower characters</b>			
1	Days taken to appearance of first male flower	4.85	17.67**	1.13
2	Days taken to appearance of first female flower	8.14	29.57**	0.11
3	Node at which the first male flower appeared	0.27	5.17**	0.08
4	Node at which the first female flower appeared	2.63	19.63**	0.25
5	Days taken to 50% male flowering	6.59	18.52**	1.36
6	Days taken to 50% female flowering	0.70	24.07**	1.01
7	Number of male flowers per vine	0.33	16101.73**	3.56
8	Number of female flowers per vine	29.70	248.85**	0.26
9	Sex ratio	0.39	11.40**	0.01
II	<b>Yield characters</b>			
10	Days to first harvest	5.92	27.55**	0.17
11	Days to last harvest	4.39	21.98**	0.60

12	Percent fruit set	0.32	23.49**	0.10
13	Fruit yield per acre (q)	7.02	238.11**	0.81
14	Rind thickness (mm)	0.14	5.84**	0.07
15	Flesh thickness (cm)	0.09	1.86**	0.03
16	Number of seeds per fruit	7.52	2407.99**	0.41
17	100 seed weight (g)	0.10	18.32**	0.00
18	Seed yield per fruit(g)	0.46	85.86**	0.02
III	<b>Quality Characters</b>			
19	Fibre content (mg per 100 gram)	0.00	0.09**	0.00
20	TSS ( <sup>o</sup> Brix)	0.03	0.17**	0.04
21	Protein (%)	0.00	0.00**	0.00

\*: Significant at 5% level; \*\*: Significant at 1% level

**Table 2:** Mean performance of parents and hybrids for yield and quality attributing traits in ridge gourd (Pooled over three seasons)

	Days to male flowering	Days to female flowering	Node of first male flower	Node of first female flower	Days to 50 % male flowering	Days to 50 % female flowering	Number of male flowers per vine	Number of female flowers per vine	Sex ratio	Days to first harvest
<b>Parents</b>										
IC 398599	37.44	45.69	4.73	13.13	48.73	57.33	266.86	44.15	6.09	52.35
IC 308561	38.33	47.42	4.78	7.53	49.62	58.37	386.26	67.00	5.84	53.90
IC 523892	34.97	42.97	7.55	15.35	46.11	54.46	268.53	47.42	5.82	49.46
IC 539714	33.75	41.89	5.46	7.88	44.77	53.22	455.68	46.62	9.80	48.27
Arka Sumeet	40.17	48.04	6.49	12.64	51.64	59.48	321.60	45.64	7.02	55.11
Arka Sujat	42.24	53.80	7.80	16.73	53.89	64.89	340.42	37.20	9.20	60.07
Mean	37.81	46.63	6.13	12.21	49.12	57.95	339.89	48.00	7.29	53.19
<b>Crosses</b>										
IC 398599 × IC 308561	35.95	43.60	6.11	9.75	47.42	55.75	267.44	52.06	5.14	49.80
IC 398599 × IC 523892	34.62	43.78	4.35	10.02	45.75	54.89	268.53	63.22	4.25	49.75
IC 398599 × IC 539714	33.64	43.18	4.62	9.31	45.55	54.68	357.27	48.93	7.41	49.26
IC 398599 × Arka Sumeet	33.22	41.73	6.55	9.46	44.31	53.29	195.64	55.42	3.55	48.00
IC 398599 × Arka Sujat	34.28	42.95	5.97	12.08	45.55	55.02	341.71	51.02	6.72	49.22
IC 308561 × IC 523892	36.04	40.24	5.68	10.86	47.29	52.82	302.68	58.55	5.20	48.28
IC 308561 × IC 539714	36.28	42.22	8.00	6.49	47.64	56.68	359.44	53.37	6.80	49.84
IC 308561 × Arka Sumeet	36.15	42.35	6.17	6.97	47.44	54.93	337.68	39.62	8.60	49.35
IC 308561 × Arka Sujat	37.46	41.89	5.13	11.24	48.75	53.13	292.11	37.80	7.77	47.88
IC 523892 × IC 539714	32.95	39.44	7.35	9.48	44.00	52.29	487.58	55.68	8.91	46.06
IC 523892 × Arka Sumeet	32.77	39.77	5.02	9.53	44.24	52.44	196.68	64.98	3.04	47.20
IC 523892 × Arka Sujat	34.78	41.26	9.40	12.76	45.93	54.51	245.95	65.53	3.77	48.28
IC 539714 × Arka Sumeet	35.95	43.20	4.84	11.66	47.37	54.71	345.89	53.59	6.56	49.01
IC 539714 × Arka Sujat	36.66	43.15	4.93	8.42	47.91	55.57	235.42	58.57	4.03	50.35
Arka Sumeet × Arka Sujat	36.67	44.80	5.51	10.78	48.09	56.38	312.99	38.22	8.33	49.91
Crosses Mean	35.16	42.23	5.975	9.920	46.48	54.47	303.13	53.10	6.00	48.81
<b>Check</b>										
Chitra	32.46	42.95	5.71	11.04	44.09	53.46	262.04	52.00	5.10	49.06
Population Mean	35.76	43.47	6.01	10.60	47.09	55.38	311.29	51.66	6.32	50.02
C.V.	6.97	8.78	10.91	8.75	9.48	7.82	7.60	6.99	5.81	4.83
SE(m) ±	0.61	0.19	0.17	0.29	0.67	0.58	1.09	0.29	0.06	0.24
C.D. 5%	1.75	0.56	0.48	0.83	1.92	1.66	3.11	0.84	0.18	0.69
Range Lowest	32.46	39.44	4.35	6.49	44.00	52.29	195.64	37.20	3.04	46.06
Range Highest	42.24	53.80	9.40	16.73	53.89	64.89	487.58	67.00	9.80	60.07

**Table 3:** Mean performance of parents and hybrids for yield and quality attributing traits in ridge gourd (Pooled over three seasons)

	Days to last harvest	Percent fruit set	Fruit yield per acre (q)	Rind thickness (mm)	Flesh thickness (cm)	Number of Seeds per fruit	Hundred seed weight (g)	Seed yield per fruit (g)	Fibre content (mg per 100g)	TSS (oBrix)	Protein (%)
<b>Parents</b>											
IC 398599	107.89	14.99	22.98	6.92	6.71	102.13	10.98	11.27	0.61	3.08	0.27
IC 308561	108.77	13.13	38.91	6.16	5.41	69.34	16.15	11.33	0.95	2.91	0.32
IC 523892	103.93	11.79	23.12	6.35	5.91	146.05	15.49	23.13	0.63	3.50	0.26
IC 539714	102.84	13.05	23.20	6.61	4.82	157.33	12.81	20.53	0.67	3.10	0.27
Arka Sumeet	109.93	11.61	28.06	6.22	5.37	120.82	15.58	18.92	0.72	4.36	0.36
Arka Sujat	114.26	12.74	23.11	4.98	4.43	106.31	14.29	15.21	0.59	3.38	0.35
Mean	107.93	12.88	26.56	6.20	5.44	116.99	14.21	16.73	0.69	3.38	0.30
<b>Crosses</b>											
IC 398599 × IC 308561	106.08	13.26	29.25	2.59	5.67	149.06	10.57	16.02	0.53	3.89	0.15
IC 398599 × IC 523892	104.31	9.73	25.86	2.83	6.67	107.78	14.54	15.69	0.80	3.39	0.24
IC 398599 × IC 539714	104.95	11.77	26.26	6.15	4.55	123.00	12.47	15.35	0.68	3.37	0.34
IC 398599 × Arka Sumeet	103.35	13.11	49.80	4.26	5.94	178.60	9.46	16.98	0.60	4.13	0.37
IC 398599 × Arka Sujat	104.29	11.98	42.36	3.83	5.09	96.06	11.54	11.13	0.43	4.27	0.34
IC 308561 × IC 523892	104.04	7.58	17.69	4.91	6.52	109.33	13.23	14.50	0.62	3.89	0.30
IC 308561 × IC 539714	106.73	16.48	33.22	4.19	5.67	131.26	13.53	18.04	1.04	3.56	0.25
IC 308561 × Arka Sumeet	107.40	12.71	19.78	3.63	4.63	97.88	12.56	12.44	0.92	3.48	0.28
IC 308561 × Arka Sujat	106.88	19.60	38.92	3.40	4.67	113.08	15.13	17.17	0.62	3.35	0.36
IC 523892 × IC 539714	104.17	12.56	32.16	3.40	6.45	134.04	12.48	16.74	1.07	3.09	0.31
IC 523892 × Arka Sumeet	103.57	9.52	42.79	5.05	7.03	184.69	18.07	32.09	0.92	2.59	0.29
IC 523892 × Arka Sujat	105.20	8.79	42.08	3.07	5.45	155.20	16.99	26.40	0.50	3.25	0.35
IC 539714 × Arka Sumeet	106.87	10.46	30.31	6.48	4.64	97.79	11.40	11.24	0.66	2.88	0.33
IC 539714 × Arka Sujat	107.37	15.16	36.29	6.37	6.13	102.46	14.71	15.09	0.94	3.96	0.32
Arka Sumeet × Arka Sujat	105.35	7.66	20.98	5.40	5.37	93.26	11.35	10.65	0.63	3.06	0.34
Crosses Mean	105.37	12.02	32.51	4.37	5.63	124.89	13.20	16.63	0.73	3.47	0.30
<b>Check</b>											
Chitra	102.64	12.49	38.04	3.97	4.94	113.06	18.75	21.27	0.74	3.91	0.27
Population Mean	105.93	12.28	31.14	4.85	5.55	121.75	13.73	16.87	0.72	3.50	0.30
C.V.	4.73	12.58	12.89	15.58	13.13	3.53	4.62	5.99	3.88	15.93	5.79
SE(m) ±	0.44	0.18	0.52	0.15	0.10	0.37	0.04	0.09	0.00	0.12	0.01
C.D. 5%	1.28	0.52	1.48	0.44	0.28	1.06	0.14	0.27	0.01	0.34	0.02
Range Lowest	102.64	7.58	17.69	2.59	4.43	69.34	9.46	10.65	0.43	2.59	0.15
Range Highest	114.26	19.60	49.80	6.92	7.03	184.69	18.75	32.09	1.07	4.36	0.37

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