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## Screening for yield and quality parameters of different chilli varieties

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### Abstract

Present investigation entitled “Structural and Functional Parameters for Screening of Different Chilli Varieties” were carried out in Kharif season during the 2015-16. Tikamgarh district lies in the Bundelkhand Zone (Agro-climatic Zone –VIII). It is situated in the north-easter part of Madhya Pradesh at 24° 43' North latitude and 78° 49' East longitudes at an altitude of 358 meter mean sea level. It has sub-tropical climate characterized by hot dry summers and cool dry winter. The soil of the experiment field was clay loam in texture. It was medium in organic matter and had good water holding capacity with pH ranging from 6.9. The experimental was laid out in the randomized block design with three replications. Varieties- V<sub>1</sub>–Pusa Jwala, V<sub>2</sub>–Pusa Sadabahar, V<sub>3</sub>–JM-218, V<sub>4</sub>–JM-283, V<sub>5</sub>–Sonakshi-44, V<sub>6</sub>–Divyajyoti, V<sub>7</sub>–Classica-152, V<sub>8</sub>–Natasha-727, V<sub>9</sub>–Suryamukhi and V<sub>10</sub>–prajwala. Observations recorded for yield and quality parameters. Results obtained in the present investigation revealed that, the highest Fruit length (11.47cm), Fruit girth (2.02cm), Fresh weight of ten fruit<sup>-1</sup> (53.55g), Number of fruit plant<sup>-1</sup> (62.63), Number of seed fruit<sup>-1</sup> (91.34), Test weight of 1000 seeds (9.24), Fruit yield plant<sup>-1</sup> (786g) and Fruit yield ha<sup>-1</sup> (291qt). Conclude that Prajwala performed the best with respect to productivity under the agro-climatic conditions of Bundelkhand (Tikamgarh) region.

**Keywords:** Chilli, varieties, yield parameters and quality parameters etc.

### Introduction

Chilli (*Capsicum annum* L.) is a member of the solanaceae family that includes tomato, potato and brinjal. Capsicum was domesticated at lost five times by prehistoric peoples in different parts of south and Middle America. The genus Capsicum consists of approximately twenty wild species and five domesticated species, most cultivated in the world belong to the species *Capsicum annum* L. The five domesticated species of chilli are as follows *Capsicum annum* L., *Capsicum frutescens* L., *Capsicum chinense* L., *Capsicum pubescens* L. and *Capsicum baccatum* L. The substances that responsible for pungency in chilli is Capsaicin (C<sub>18</sub> H<sub>37</sub> NO<sub>3</sub>) and several related chemicals, collectively called Capsaicinoids. Green fruit of chilli and sweet peppers are one of the richest sources of anti-oxidant vitamins such as vitamin A, C and E. these anti-oxidants in food protect occurrence of cancer. Chilli (*Capsicum annum* L.) is a vegetable as well as spice and one of the most important cash crops of India. It is used for industrial purpose due to extraction of oleoresin. India is the world largest producer, consumer and exporter of chilli. Guntur in Andhra Pradesh is produces 30% of chilli particularly in India. This has the potential for improving the income and the livelihood of thousands of small holder farmers. The present research works on “Structural and Functional Parameters for Screening of Different Chilli Varieties” was conducted with objective to study the periodic changes in structural and functional parameters of different varieties of chilli.

### Materials and Methods

Tikamgarh district lies in the Bundelkhand Zone (Agro-climatic Zone –VIII). It is situated in the north-eastern part of Madhya Pradesh at 24° 43' North latitude and 78° 49' East longitudes at an altitude of 358 meter mean sea level. It has sub-tropical climate characterized by hot dry summers and cool dry winter. The average maximum temperature during the month of October varies between 35.0 to 36.50C, while the average minimum temperature varies between 3.5 to 5.5 0C during month of December, which is the coldest month of the year. The average Season rainfall of this region is about 213.7mm which is mostly received between July- August and a little rainfall is also obtained during January. The average humidity of the tract is about 73%. The soil of the experiment field was clay loam in texture.

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It was medium in organic matter and had good water holding capacity with PH ranging from 6.9. The manure and fertilizers were applied as per respective plot. Full dose of RDF (100: 60: 40 kg NPK ha<sup>-1</sup>) and 1/3 nitrogen were given to the plot before sowing as basal dose. Remaining 2/3 quantity of nitrogen was applied in two split doses *i.e.*, 30 and 60 day after transplanting. The experimental was laid out in the randomized block design with three replications. Varieties- V<sub>1</sub>-Pusa Jwala, V<sub>2</sub>-Pusa Sadabahar, V<sub>3</sub>-JM-218, V<sub>4</sub>-JM-283, V<sub>5</sub>-Sonakshi-44, V<sub>6</sub>-Divyajyoti, V<sub>7</sub>-Classica-152, V<sub>8</sub>-Natasha-727, V<sub>9</sub>-Suryamukhi and V<sub>10</sub>-prajwala. Observations recorded for yield and quality parameters. Five plants were randomly selected from each treatments and replication for the study. Fruit length, Fruit girth, Fresh

weight of ten fruit<sup>-1</sup>, Number of fruit plant<sup>-1</sup>, number of seed fruit<sup>-1</sup>, Test weight, Fruit yield plot<sup>-1</sup> and Fruit yield ha<sup>-1</sup>.

## Results and Discussion

### (A) Yield Parameters

#### Number of fruit plant<sup>-1</sup>

The different varieties varied significantly with respect to formation of fruit plant<sup>-1</sup> as shown in table-1. JM-283 produced significantly higher number of fruits plant<sup>-1</sup> (62.63) as compared to all the varieties. The second best variety was Prajwala producing 61.42 fruits plant<sup>-1</sup>. The third best variety was Classica-152 (59.02 fruits plant<sup>-1</sup>). Pusa Jwala produces significantly lowest fruits (26.23 fruits plant<sup>-1</sup>), closely followed by Pusa Sadabahar (26.94 fruits plant<sup>-1</sup>).

**Table 1:** Mean performance of yield characters of chilli.

Genotypes	Number of fruits /plant	Number of seeds /fruit	Test weight (g)	Fruit yield/plant (g)	Fruit yield/plot (kg)	Fruit yield/ha (t)
Pusa Sadabahar	26.94	35.73	5.14	143.0	8.580	5.30
JM-218	35.16	46.49	5.99	177.0	10.620	6.56
JM-283	62.93	31.07	4.89	247.0	14.820	9.15
Sonakshi- 44	45.94	71.21	7.11	561.0	33.660	20.78
Divya Jyoti	46.76	37.51	5.15	508.0	30.480	18.81
Classica- 152	59.02	45.65	9.24	676.0	40.560	25.04
Natasha-727	51.82	47.00	9.22	713.0	42.780	26.41
Suryamukhi	37.09	82.19	4.70	188.0	11.280	6.41
Prajwala	61.42	91.34	7.01	785.7	47.160	29.10
Pusa Jawala (Control)	26.23	39.39	5.33	129.0	7.740	4.78
S.Em±	1.53	1.56	0.32	5.07	0.92	0.57
C.D.5% level	4.56	4.64	0.95	15.05	2.73	1.68

#### Number of seeds per fruit

The data in the same table-1 reveal that this parameter was also influenced significantly due to different varieties. Prajwala recorded maximum seeds (91.34 per pod) closely followed by Suryamukhi (82.19 seeds per pod) and then Sonakshi-44 (71.21 seeds per pod). This was lowered down in other varieties consequently JM-283 and Pusa Sadabahar recorded the significantly lowest seeds (31.07 to 35.73 per pod), followed by Sonakshi-44 (37.51 seeds per pod).

#### Test weight of 1000 seeds (g)

The test weight was also found to differ significantly amongst the different varieties (table-1). Classica-152 attained the highest test weight (9.24g) closely followed by Natasha-727 (9.19 g) and then Sonakshi-44 (7.11 g). On the other hand, the significantly lowest test weight (4.70 g) was noted from Suryamukhi varieties. This was lowered followed by JM-283 (4.89 g). The remaining varieties attained intermediate test weight.

#### Fruit yield plant<sup>-1</sup> (g)

The different varieties varied significantly with respect to formation of fruit yield plant<sup>-1</sup> as shown in table-1. Prajwala produced significantly higher fruit yield plant<sup>-1</sup> (786 g) as compared to all the varieties. The second best variety was Natasha-727 producing (713 g fruits plant<sup>-1</sup>). The third best variety was Classica-152 (676 fruits plant<sup>-1</sup>). Pusa Jwala produces significantly lowest fruits yield (129 g fruits plant<sup>-1</sup>), closely followed by Pusa Sadabahar (143 g fruits plant<sup>-1</sup>).

#### Yield per ha (t)

The different varieties varied significantly with respect to formation of total yield ha<sup>-1</sup> as shown in table-1. Prajwala produced significantly higher total yield ha<sup>-1</sup> (29.10 t) as

compared to all the varieties. The second best variety was Natasha-727 producing (26.41 t ha<sup>-1</sup>). The third best variety was Classica-152 (25.04 t ha<sup>-1</sup>). Pusa Jwala produces significantly lowest fruits weight (4.78 t ha<sup>-1</sup>), closely followed by Pusa Sadabahar (5.30 t ha<sup>-1</sup>).

### (B) Quality parameters

#### Fruit length (cm)

The perusal of data in the same table-2 indicated that the fruit length was also found to differ among the different varieties. The significantly higher fruit length (11.47 cm) was noted in case of Prajwala variety over all the varieties. However this was equally followed by Sonakshi-44 and JM-218 (10.03 to 9.42 cm). There after JM-283 recorded lower fruit length (5.27 cm) and Suryamukhi (7.18 cm).

#### Fruit girth (g)

The perusal of data in the same table-2 indicated that the fruit girth was also found to differ among the different varieties of chilli. The significantly higher fruit girth (2.02 cm) was noted in case of Natasha-727 variety over all the varieties. However this was equally followed by Prajwala and JM-283 (1.42 to 1.30 cm). There after Sonakshi-44 recorded lower fruit girth (1.04 cm) and Pusa Sadabahar (1.06 cm).

#### Fresh weight of ten fruits (g)

The perusal of data in the same table-2 indicated that the fruit girth was also found to differ among the different varieties of chilli. The significantly higher fresh weight of ten fruits (53.55 g) was noted in case of Natasha-727 variety over all the varieties. However this was equally followed by Prajwala and Classica-152 (49.12 to 43.45 g). There after JM-283 recorded lower fruit girth (24.64 g) and Pusa Sadabahar (27.60 g).

**Table 2:** Mean performance of quality characters of chilli.

Genotypes	Fruit length (cm)	Fruit girth (cm)	Fresh weight of ten fruit (g)
Pusa Sadabahar	7.37	1.06	27.60
JM-218	9.42	1.19	34.54
JM-283	5.27	1.30	24.64
Sonakshi- 44	10.03	1.04	39.35
Divya Jyoti	9.35	1.24	35.04
Classica- 152	7.66	1.21	43.45
Natasha-727	8.73	2.02	53.55
Suryamukhi	7.18	1.29	32.50
Prajwala	11.47	1.42	49.12
Pusa Jawala (Control)	8.84	1.15	29.24
S.Em±	0.59	0.04	1.28
C.D.5% level	1.76	0.12	3.81

### Conclusion

The present results on the Structural and Functional Parameters for Screening of Different Chilli Varieties” conclude that Prajwala performed the best with respect to productivity under the agroclimatic conditions of Bundelkhand (Tikamgarh) region. This variety produced 29.10 t/ha chillies. However, this was almost equally followed by Natasha-727 and Sonakshi-44. Prajwala recorded maximum number of seed (1.30 mm) and fruit length (1.87 cm), whereas Natasha-727 resulted in highest fruit girth (11.20 cm) as well as fresh weight of ten fruits.

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