



# Asian Journal of Plant Sciences

ISSN 1682-3974

**science**  
alert

**ANSI***net*  
an open access publisher  
<http://ansinet.com>

## Comparative Performance of Local and Exotic Chilli Cultivars

Tariq Mahmood, Syed Ijaz Hussain, Khalid Mahmood Khokhar, Hidayatullah and M. H. Bhatti  
Vegetable Crops, Horticulture Research Institute, National Agricultural Research Center,  
Park Road, Islamabad, Pakistan

**Abstract:** Twenty three exotic and one local cultivar of chillies were tested in an observational trial during 1998. Out of these 9 selected cultivars/lines PBC-581, PP 9656-15, BS-96, MI-2, PBC-534, Korean, PBC-386, PP 9656-6, and NARC-IV were further evaluated for yield, green and red fruit characteristic in a replicated trial during 2000. PBC-581 (17.33 t/ha) and PP9656-15 (16.04 t/ha) gave highest green fruit yield followed by BS-96 and MI-2 whereas, the local cultivar NARC IV produced the lowest yield (3.68 t/ha). Data regarding fruit size, color, position, bearing habit and pungency were also recorded. Maximum weight loss due to drying of red chilli fruit was observed in BS-96, whereas the lowest weight loss (68.72%) was recorded in cv. Korean.

**Key words:** Chilli crop, cultivar, performance, agronomic data

### Introduction

Chilli (*Capsicum annum* L.) is a major vegetable crop of Pakistan grown throughout the country, especially in Hyderabad and Tharparkar area. The area under this crop is 88700 hectares with production of 136600 tones (Anonymous, 2000). The average national yield is 1.54 t/ha. Sindh produces about 70% of the chilli crop followed by Punjab (25%) and remaining 5% is produced in Balochistan and NWFP (Anonymous, 2000). Villalon *et al.* (1986) developed and characterized the chilli cv., Tam Mild Chile 2 (TMC 2). The cultivar was obtained by crossing Brazilian cultivar Agronomic 8 and Avelar. The green fruit which can be machined harvested is suitable for fresh consumption or processing into a direct product. The fruit is also recommended for red chilli powder. Gomez *et al.* (1994) compared three capsicum cultivars for flowering dates and yield, and found that cvs. Vidi and Elisa yielded almost twice as compared to the cv. Finco. Niu and Shuqin (1994) developed a new chilli cultivar by crossing Niu 733-4-1-1-1 with Dun 81-2-1-3. The cultivar has small horn shaped fruit with pungent flavor. The cultivar is early and high yielding. The fruit contains 1.28% oil and 12.3% dry matter. Singh *et al.* (1999) evaluated 12 chilli varieties during spring-summer season under the agro-climatic conditions of Patannagar, India and found cvs., G-4, CA 586 and CA 206 out yielded Pusa Jwala by 39.3, 41.2, 51.0 and 57%, respectively. Six chilli cultivars were compared in field trials in Nigeria and fruit length, plant height, days to maturity, dried fruit yield and resistance to PVMV (pepper veinal motile polyvirus) were assessed (Alegbejo *et al.* (1999). Mahmood *et al.* (1999) also evaluated ten chilli cultivars for yield and yield components under Islamabad condition.

The objective of this experiment was to evaluate exotic and local hot pepper cultivars for yield and other characteristics.

### Materials and Methods

Twenty three exotic cultivars MI-2, PP 9656-6, LS-279, PBC-369, PBC-161, PP 9656-14, PBC-904, PP 9656-13, PP 9656-11, PBC-142, PP9656-8, K. A-2, PBC-482, Korean, PBC-386, PBC-534, PP 9656-15, PBC-581, PBC-390, CA-8, PBC-137, PP 9656-1, PBC-091 and one local cultivar NARC IV were evaluated in an observational trial. Each cultivar was transplanted on April 13, 1998 at

NARC, Islamabad in a plot measuring 7.5 m<sup>2</sup> with row to row and plant to plant distance of 50 and 75 cm, respectively. Data were recorded for number of fruit per plant, weight of fruit per plant, fruit size and yield. Based upon different fruit and yield characteristics eight exotic cultivars PBC-581, PP 9656-15, BS-96, MI-2, PBC-534, Korean, PBC-386, PP 9656-6 and a local cultivar NARC-IV were further evaluated. Seeds of selected cultivars were sown in January 2000 in plastic multipot trays. The multipot trays were filled with basal growth medium (mixture of soil, sand and FYM, in the ratio of 1: 1: 1). Trays were placed under polythene tunnels for germination. At 2-3 true leaf stage on April 8, 2000 the seedlings of each cultivar were transplanted in a plot (7.5 m<sup>2</sup>) with plant to plant and row to row distances 50 and 75 cm, respectively. The trial was laid out in a Randomized Complete Block Design (RCBD). Data regarding fruit weight, yield, number, length, width, color, position, bearing habit and pungency of green fruit were determined. Ten red fruit per replication for each cultivar were harvested and data regarding fruit weight (fresh and dry), weight loss due to drying of red chilli fruit and seed number/ fruit were determined. Urea and DAP were used as source of Nitrogen and Phosphorus (46:23) in two doses (basal and supplementary). The collected data was analyzed, treatments were compared by using Duncan's Multiple Range (DMR) test (Steel and Torrie, 1980).

### Results and Discussion

**Green fruit characteristics:** The yield and fruit characteristics of twenty-four cultivars (23 exotic and one local) have been evaluated in an observational trial during 1998 in order to obtain preliminary information regarding fruit characteristics and yield. Based upon yield, fruit size and seed availability, eight exotic cultivars i.e., PBC-581, PP 9656-15, BS-96, MI-2, PBC-534, Korean, PBC-386, PP9656-6 and one local cultivar i.e., NARC IV were further evaluated in a replicated trial in 2000. Cultivar PBC-581 gave the highest yield (17.33 t/ha) which do not differ significantly from PP 9656-15 (Table 1). However, the yield of cv., PBC-581 was significantly higher than rest of cultivars i.e. BS-96, MI-2, PBC-534, Korean, PBC-386, PP9656-6 and NARC-IV. The yield of cvs. PP9656-15, BS-96 and MI-2 do not differ significantly. However the yield of cv., PP 9656-15 was significantly higher than PBC-534,

Table 1: Data regarding green fruit yield and other characteristics of different chilli cultivars

Cultivars	Avg. fruit wt. (g/plant)	Fruit yield (t/ha)	Avg. fruit (No./plant)	Avg. fruit length(cm)	Avg. fruit width(cm)	Avg. fruit wt.(g)
PBC-581	650.0A	17.33A	188.6AB	7.92A	1.14AB	5.70AB
PP9656-15	601.6AB	16.04AB	218.8A	5.56C	0.833CD	1.82EF
BS-96	462.4BC	12.33BC	136.9BC	7.40AB	0.877CD	6.40A
MI-2	428.1BC	11.42BC	210.4A	6.41BC	0.833CD	3.01DE
PBC-534	416.7BC	10.78C	139.1BC	7.40AB	0.943BCD	7.04A
Korean	399.5C	10.65C	202.3A	2.80D	1.24A	1.73EF
PBC-386	392.8C	10.47C	113.5C	7.12AB	1.00BC	4.84BC
PP9656-6	311.9C	08.32C	106.3C	6.72ABC	1.00BC	4.03CD
NARC-IV	138.1D	03.683D	079.72C	2.98D	0.757D	0.787F

Values followed by the same letters do not differ significantly at 5% level of significance.

## Mahmood *et al.* : Chilli crop, cultivar, performance, agronomic data

Table 2: Data regarding green fruit color, bearing and pungency of different chilli cultivars

Cultivars	Fruit color	Fruit position	Fruit bearing	Pungency
PBC-581	Light green	Downward	Single	Very hot
PP 9656-15	Light green	Upward	Bunches	Extreamlyhot
BS-96	Green	Downward	Single	Hot
MI-2	Green	Downward	Single	Hot
PBC-534	Dark green	Downward	Single	Extreamlyhot
Korean	Light green	Upward	Single	Very hot
PBC-386	Green	Downward	Single	Hot
PP9656-6	Dark green	Downward	Single	Very hot
NARC-IV	Light green	Upward	Bunches	Very hot

Table 3: Data regarding red fruit characteristics of different chilli cultivars

Cultivars	Avg. fruit fresh wt. (g)	Avg. fruit dry wt (g)	Avg. wt. loss (%age) due to drying	Avg. seeds no/dry fruit
PBC-386	5.42A	0.933A	82.94C	51.11AB
PBC-581	5.19A	0.877AB	82.62CD	53.11A
MI-2	4.03B	0.823AB	79.62DE	57.67A
BS-96	3.95B	0.310C	92.09A	18.33D
PBC-534	3.54B	0.667B	81.18CDE	27.78CD
PP9656-15	2.30C	0.443C	80.71CDE	36.67BC
PP9656-6	2.28C	0.300C	87.01B	17.45D
Korean	1.36CD	0.420C	68.72F	45.67AB
NARC-IV	1.09D	0.223C	79.29E	27.67CD

Values followed by the same letters do not differ significantly at 5% level of significance.

Korean, PBC-386, PP9656-6 and NARC-IV. The lowest yield (3.68 t/ha) was observed in NARC IV. Similar results were obtained by other researchers in which the response of different cultivars in yield in different environments was also reported by Hidayatullah *et al.* 1996; Singh *et al.* 1999; Albegbejo *et al.*, 1999; Mahmood *et al.*, 1999. Fruit length of cvs., PBC-581, BS-96, MI-2, PBC-534, PBC-386, PP 9656-6, PP9656-15 was maximum ranging from 5.56 to 7.92 cm (Table 1). All above cultivars seems promising for green fruit production. Fruit length of cvs. Korean and NARC IV was significantly lower (2.8 to 2.98 cm) than rest of cultivars. Fruit length of Korean and NARC IV are in support of results of Mahmood *et al.* (1999). Fruit color of cvs. BS-96, MI-2 and PBC-386 was green while cvs. PBC-581, PP 9656-15, Korean and NARC-IV had light green color (Table 2). The rest of the cultivars were dark green in color. Fruit position of two cvs. PP 9656-15 and NARC IV and Korean were upward and rests of the cultivars were downward. Fruit

bearing was in bunches in cvs. PP 9656-15 and NARC IV while rest of the cultivars bore fruit in single. Pungency level of all cultivars was evaluated and presented in Table 2. The pungency level of cvs Korean and NARC IV are in agreement to the findings of Mahmood *et al.* (1999).

**Red fruit characteristics:** Average weight of fresh and dried red chilli fruit of nine cultivars were determined and presented in Table 3. Average dry weight of red fruits of three cvs. PBC-386, PBC-581 and MI-2 were higher and do not differ significantly. Maximum weight loss due to drying was 92.09% in BS-96 which was significantly higher than rest of cultivars. Minimum weight loss due to drying was 68.72% in Korean. Weight loss in red fruits due to drying in rest of the cultivars ranged between 79.29 to 82.92%. Cultivars having higher wt. loss due to drying in red fruit usually have lower number of seeds/fruit (Table 3). Villan *et al.* (1986) reported 12.3% dry matter in cultivar TMC2 as compared to 32.28% in cv. Korean in our studies. Twenty three exotic and one local cultivar were tested, cvs. PBC 581 and PP 9656-15 gave highest fruit yield whereas NARC IV gave the lowest yield.

### References

- Alegbejo, M. D., F. C. Orakwae and S. G. Ado, 1999. Characteristics of chilli pepper cultivars released by the institute for Agric. Res. Samaru Nigeria. *Capsicum and Eggplant Newsletter*, 18: 21-24.
- Anonymous, 2000. *Fruit, Vegetable and Condiments*. Govt of Pakistan. MINFAL, Islamabad. pp: 11-19.
- Gomez, C., C. Hernandez and N. Zamudio, 1994. Comparative study of Capsicum cultivars in a green house. *Advance Agro industrial*, 14: 40-41.
- Hidayatullah, T. Mahmood and M. A. Khan, 1996. Varietal evaluation and screening of chillies. Final report, South Asian Vegetable Research Network presented at final workshop at Khatmandu, pp: 44-47.
- Mahmood, T., H. Ullah, C. M. Farooq, S. Riaz and K. Burney, 1999. Evaluation of chilli cultivars under Islamabad conditions. *Sarhad J. Agric.*, 15:115-117.
- NIU, E. and Q. Shuqin, 1994. New released pungent Capsicum pepper cultivar Tian Jiao 2. *China Vegetable*, 6:19.
- Singh, D. K., G. Lal, S. K. Jain and G. Lal, 1999. Evaluation of chilli cultivars during spring- summer season in Himalayan foots of Utar-Pradesh. *Scientific Horticulture*, 6: 117-120.
- Steel, R. G. D. and G. H. Torrie, 1980. *Principles and Procedures of Statistics*. Mc raw Hill Book Co. Inc. New York.
- Villalon, B, F. J. Dainello and R. M. Taylor, 1986. Tam mild chilli-2, Chilli pepper. *Hort. Sci.*, 21: 1468-1469.