

## PERFORMANCE OF *CUCUMIS SATIVUS* L. ACCESSIONS UNDER TUNNEL

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### ABSTRACT

Adaptability of five exotic varieties of cucumber (*Cucumis sativus* L.) viz. CU-2833, CU-5555, GR-102, CFMC-0036, CFMC-0031 was tested under tunnels at Vegetable Research Institute, AARI, Faisalabad, Pakistan during 2012. These exotic lines were compared with locally developed line “Kheera Local” during autumn 2012. Differences of mean yield and number of fruits were found significant among six varieties while emergence percentage was found non-significant. The results concluded that plastic tunnels gave early and more production. Exotic varieties produced early fruiting and gave more returns. However, CU-2833 and CU-5555 topped the list with 35.5 and 33.9 tons per hectare, respectively. Locally developed variety “Kheera Local” excelled all these varieties with 48.7 tons per hectare yield. This line also proved to be suitable for prolonged availability of cucumber fruit because it tolerated more temperature as compared with exotic varieties.

**KEYWORDS:** *Cucumis sativus*; cucumber; tunnels; varieties; Pakistan.

### INTRODUCTION

The cucumber (*Cucumis sativus* L.) belongs to one of important plant family *Cucurbitaceae*. The *Cucurbitaceae* consists of 90 genera and 750 species. The genus *Cucumis* contains nearly 40 species including three important cultivated ones *C. anguria* L. (West Indian gherkin), *C. sativus* (cucumber) and *C. melo* L. (cantaloupe). Cucumber (*Cucumis sativus* L.) locally known as “Kheera” is native to Asia and Africa, where it has been in use for 3,000 years. Today cucumbers are grown all over the world for salad and pickling purpose that is why fruit is commonly harvested at green stage. It is a major vegetable crop worldwide and has a shorter life time from planting to harvesting (9). Due to its use in food medicines it is playing vital role in the locality (5).

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The crop is the fourth most important vegetable crop after tomato, cabbage and onion in Asia and the second most important vegetable crop after tomato in Western Europe (4). The cucumber is cultivated on large scale in open field but the use of high plastic tunnels has gained popularity in recent years in Pakistan (2). In Pakistan, cucumber is grown on 3397 hectares with a production of 48535 tons (2). The variation in performance of cucumber varieties has been widely documented by many researchers (1), which could be the result of environmental factors or genetic composition (4). The unheated greenhouse, or high tunnel, offers a vertical production environment suitable for crops such as indeterminate tomatoes and cucumbers. However, cucumber can provide good returns when grown under tunnel with controlled environment and consistent pest control.

The present study was conducted to determine the yield performance of promising varieties of cucumber (local as well as exotic) for longer availability of crop.

## **MATERIALS AND METHODS**

This study was conducted at Vegetable Research Institute, AARI, Faisalabad, Pakistan. Five exotic cucumber varieties (CU-2833, CU-5555, GR-102, CFMC-0036 and CFMC-0031) and one local variety Kheera Local were planted in high tunnel in November 2012. Seed rate was kept as 700-900 g/acre. The high tunnel, fabricated on farm, was 20 x 75 feet galvanized steel structure, covered with a sheet of polythene. The trial was arranged in RCBD with three replications. The data recorded were subjected to analysis of variance (7) to estimate the differences among accessions. The date were also recorded for emergence percentage, number of fruits per plot and yield (t/ha) of all varieties. Data were analyzed using statistical software analysis of variance (ANOVA) procedure (Statistiz 8.1) and treatment means were separated using Fishers protected least significant difference test ( $p < 0.05$ ).

## **RESULTS AND DISCUSSION**

The results indicated significant differences for yield and number of fruits among six varieties but emergence percentage was found as non-significant. Maximum average fruit weight was noted in Local Kheera (191.39 g) and minimum in CFMC-0036 (93.14 g) (Table 1). Likewise maximum average yield was obtained from Local Kheera (25.32 kg/plot) followed by CU-2833 (18.45 kg/plot) minimum in case of CFMC-0031 (7.95 kg/plot). Maximum number of fruits were noted in CU-2833 (191.00/plot) followed by CU-5555

(168.7/plot) in and minimum in case of CFMC-0031 (75.00/plot). The results (Table 2) showed significant differences among varieties in yield contributing characters i.e. number of fruits per plot and average fruit weight. However the results of emergence percentage were statistically non-significant.

**Table 1. Mean fruit weight, mean yield (kg) and mean number of fruits per plot of all cucumber varieties.**

Varieties	Mean fruit weight (g)	Mean yield (kg)	Mean number of fruits
CU-2833	95.84	18.45	191.00
CU-5555	104.28	17.64	168.7
CFMC-0036	93.14	12.85	137.7
CFMC-0031	104.57	7.95	75.00
GR-102	112.00	16.67	145.7
Kheera Local	191.39	25.32	131.3

The data (Table 2) also showed that Kheera Local variety gave maximum yield (48.7 t/ha). Although local variety gave maximum production but it could not give maximum profit due to late fruiting. Exotic varieties produced fruits in plastic tunnels at early stage. Due to high market prices at early stage exotic lines gave maximum return. CU-2833 started fruiting from February 22, 2013 while Kheera local variety started fruiting from March 19, 2013. So CU-2833 gave more profit with 35.5 tons per hectare yield whereas, CFMC-0031 produced the lowest yield (15.3 t/ha)..

**Table 2. Performance of cucumber hybrids/varieties in adaptability trial at Vegetable Research Institute, Faisalabad.**

Rank	Varieties	Emergence (%)	No. of fruits /plot	Fruit yield (t/ha)
1.	CU-2833	83.3	191.0	35.5
2.	CU-5555	81.1	168.7	33.9
3.	CFMC-0036	80.0	137.7	24.7
4.	CFMC-0031	83.3	75.0	15.3
5.	GR-102	83.3	145.7	32.1
6.	Kheera Local	78.9	131.3	48.7
	LSD (0.05)	NS	59.3	15.3

### Emergence percentage

Emergence percentage ranged from 78.9 to 83.3 (Table 2). Emergence percentage was more than 80% in all varieties except in Kheera Local. On an average basis, CU-2833, CFMC-0031 and GR-102 varieties gave maximum emergence percentage (83.3%) against minimum emergence percentage in

local variety (78.9%). There were no significant differences among all varieties for emergence percentage.

These results are in line with the findings of Thoa (8) who observed that cucumber can be planted at any time and that even in temperate regions. During winter, the crop can be grown under greenhouse conditions but there is a fluctuation in the performance of lines due to their genetics and adaptability for specific environment.

The high yield consistently recorded in Kheera Local throughout the season could be attributed to its genetic composition and its ability to adapt the hot environment as compared with exotic varieties. Staub *et al.* (6) reported that cucumber yield is influenced by genetic and environmental factors, and as such it is variable depending upon growing season and region (4).

### CONCLUSION

The study concludes that CU-2833, CU-5555 and GR-102 were early fruiting varieties with maximum production among exotic varieties but their production was lower than Local variety. It is observed that exotic early maturing varieties are suitable for plastic tunnel to get maximum profit. For maximum and longer time production Kheera Local is best because it is a heat tolerant variety developed by Vegetable Research Institute, Faisalabad, Pakistan for general cultivation throughout Punjab in hot climate due to its adaptability.

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