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Varietal Differences in Tomato Crop Grown in Islamabad Conditions

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Abstract: An experiment was designed to study the morphological and yield behavior of nine exotic and one local cultivar of tomato under Islamabad conditions. Characters studied were time required to flowering, fruit setting, fruit ripening, yield/plant and yield ha⁻¹. Significant difference in the parameters except days to maturity were observed which could be attributed to inherited differences among cultivars. Cultivar marmande (TMV) took significantly minimum time (65.0 days) to ripen followed by S. marzano which ripened in 72.3 days. Cultivar polefemo ripened late (91.7 days) followed by marmande which took 88.7 days to ripen. Cultivars marmande TMV and marmande out yielded other cultivars with 64.29 and 62.99 t ha⁻¹, respectively while poor yield was obtained in S. marzano (14.90 t ha⁻¹).

Key words: Flowering, fruit setting, fruit maturity, yield

Introduction

Tomato (*Lycopersicon esculentum* Mill.) is an important crop and is grown throughout the year in Pakistan. Average yield of tomato in Pakistan is 9.6 t ha⁻¹ (Anonymous, 1999), which is quite low because the varieties commercially grown in our country are low yielding and don't respond well to our growing conditions. The increasing demand can be met only with increase in production per unit area. The lower yield in tomato could be due to the fact that the presently grown cultivars are much sensitive to hot climate, which limits the production of the crop to early summer.

There exists a lot of variation in tomato varieties for different characters like fruit shape, size, firmness, yield and quality (Georgiev *et al.*, 1988; Suwvan and Abu-Baker, 1986; Chaudhry *et al.*, 1999). Gabal *et al.* (1985) observed that varieties VFN Bush and Shan had slightly oblong fleshy fruits and mean fruit weight varied considerably from 66.6 g in Shain B to 99.7 g in VFN Bush. Khokhar *et al.* (1988) reported that fruit maturation period ranged from 55 to 62 days in different cultivars. They further reported that in various cultivars plant height, number of fruit per plant, single fruit weight, fruit weight per plant and average yield, ranged from 81 to 103 cm, 5.8 to 30.5, 25.74 to 146.93 g, 734 to 1330 g and 21.18 to 35.5 t ha⁻¹ respectively. Hussain *et al.* (2001) reported that the cultivar tanja produced maximum fruit weight per plant (1.55 Kg) and gave the highest yield of 41.45 t ha⁻¹. It was followed by 'Chico-III' and 'Sorrento' which exhibited average yields of 40.32 and 39.13 t ha⁻¹ respectively. Ermolova and Some cultivars have wider adoption while others provide a valuable source of variability in breeding material. The yielding ability of a genotype is the result of its interaction with the environment.

The study was therefore planned to evaluate nine exotic and one local tomato cultivar for yield response under the prevailing agroclimatic conditions of Islamabad.

Materials and Methods

This study was conducted at National Agriculture Research (NARC) Islamabad during summer 1994. Nine exotic cultivars namely anco,

giasone, linco, OZ-181, marmande, marmande (TMV), polefemo, grinta, S. marzane and one local cultivar roma were sown in randomized complete block design (Steel and Torrie, 1980). During January, seeds were sown in multipots for nursery raising. Forty days old uniform seedlings were transplanted during the first week of March. Each plot comprised of three rows, five meter long. The distance between row to row and plant to plant was 75 and 50 cm respectively.

Data were recorded on days to flowering, fruits setting, maturity, fruits per plant and yield ha⁻¹. The data were analyzed by the analysis of variance and the test of significance was applied at 5 % probability level following Duncans multiple ranges test (Steel and Torrie, 1980).

Results and Discussion

Days to flowering: Significant differences in number of days to flowering were observed among the cultivars. Cultivar polefemo took relatively longer time to flowering (19.3 days) followed by marmande (16.7 days) and marmande TMV (15.7 days). Cultivars roma and giasone flowered in the shorter time taking only 11.3 days. Khokhar *et al.* (1988) and Chaudhry *et al.* (1999) also reported variation in flowering time in different tomato cultivars.

Days to fruit setting: Cultivar polefemo which took more time to flowering (19.3 days) was also late in fruit setting (27.3 days) as compared with other cultivars. In cultivar giasone fruit setting was early (17.0 days). Time variation in fruit setting in various tomato cultivars was also observed by Khokhar *et al.* (1988) and Chaudhry *et al.* (1999).

Days to maturity: Cultivar marmande (TMV) took significantly minimum time (65.0 days) to ripen followed by S. marzano which ripened in 72.3 days. Cultivar polefemo ripened late (91.7 days) followed by marmande which took 88.7 days to ripen. The other cultivars were medium in maturity taking 74.7 to 80.3 days to ripen.

Table 1: Data regarding morphological and yield behavior of different cultivars of tomato grown in Islamabad conditions

| Cultivars | Days to flowering | Days to fruit setting | Days to maturity | Yield/plant (kg.) | Yield ha ⁻¹ (tones) |
|----------------|-------------------|-----------------------|------------------|-------------------|--------------------------------|
| Anco | 13.0bcd | 19.0bc | 80.3c | 1.629bc | 43.25bc |
| Giasone | 11.3d | 17.0c | 76.3e | 1.756b | 46.84b |
| Lincon | 13.7bcd | 19.0bc | 76.0e | 1.667b | 46.06b |
| OZ-181 | 12.3cd | 18.0bc | 74.7f | 1.246cd | 33.22cd |
| Marmande | 16.7ab | 26.7bc | 88.7b | 2.344a | 62.99a |
| Marmande (TMV) | 15.7abc | 22.3a | 65.0h | 2.411a | 64.29a |
| Polefemo | 19.3a | 27.3a | 91.7a | 0.931de | 24.89de |
| Grinta | 13.0bcd | 17.7bc | 77.3d | 1.084d | 18.90d |
| S. marzano | 13.7bcd | 20.0bc | 72.3g | 0.577e | 14.90e |
| Local roma | 11.3d | 16.7c | 76.7e | 1.095d | 30.86d |

Means followed by different letters don't differ significantly at P < 0.05

Hussain *et al.*: Varietal differences in tomato

Yield ha⁻¹: Significant differences in fruit yield ha⁻¹ were observed among the cultivars. Cultivars marmande TMV and marmande out yielded other cultivars with 64.29 and 62.99 t ha⁻¹, respectively while poor yield was obtained in S. marzano (14.90 t ha⁻¹). These results are in agreement with those of Hussain *et al.* (1990), Hussain *et al.* (2001), Gabal *et al.* (1985), Khokhar *et al.* (1988) and Chaudhry *et al.* (1999) who reported yield differences in various tomato cultivars.

The cultivars marmande (TMV), marmande, anco, giasone and lincon showed good result in Islamabad conditions (Table 1).

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