

Association and contribution of different characters towards fruit yield in tomato (*Lycopersicon esculentum* Mill.) in north western Hill Zone

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ABSTRACT

Correlations, variation and path coefficients for 13 yield attributes were estimated in 19 tomato genotypes. Analysis of variance indicated sufficient amount of variability among the genotypes. Genotypes VTG 9, VTG 5 and VTG 4 were best for yield/plant, fruits/bunch and fruits/plant, respectively on the basis of *per se* performance. Significant and positive correlation of yield was recorded with fruits/plant, number of primary branches, plant height and fruits/bunch suggesting scope for improvement through simple selection. Path coefficient analysis further indicated the importance of fruits/plant, fruit width, days to 50% flowering and fruits/bunch as these characters showed highest direct effects on grain yield.

Key words: Character association, path coefficient analysis, tomato, yield characters.

INTRODUCTION

Tomato is one of the most popular and widely grown vegetables in the world ranking second in importance to potato including India (Bose and Som, 2). The North Western Hills with varying temperatures, day length and moderate rainfall conditions are ideally suited for vegetable cultivation. Tomato is extensively grown during rainy and summer season in hills. The summer season crop grown in lower and mid-hill pockets of the North Western hills fetches high prices being off-season crop for the plains. For development of high yielding tomato varieties information on the magnitude of variation and character's association is essential. Furthermore, path coefficient analysis is useful in understanding the relative importance of direct and indirect influence of each of the component character on the dependent character. Therefore, the present study was undertaken to measure the extent of genetic variation, association among different characters and their effect on fruit yield.

MATERIALS AND METHODS

Nineteen tomato genotypes both exotic as well as indigenous were evaluated in randomized complete block design with two replications at Hawalbagh farm Almora, situated at an altitude of 1,250 m above msl. Each plot comprised of two rows, 2 m long with inter- and intra-row spacing of 50 cm and 40 cm, respectively. All the recommended agronomic practices were followed to raise a healthy crop. Four plants randomly selected were tagged in each plot for recording of data on thirteen yield attributes. The correlations were worked out as suggested by Panse and Sukhatme (5). Path coefficient analysis was calculated as per Dewey and Lu (3).

RESULTS AND DISCUSSION

The analysis of variance for different characters showed highly significant differences, except number of primary and secondary branches, indicating sufficient variability among the genotypes. *Per se* performance indicated that VTG 9, VTG 5 and VTG 4 ranked first for yield/plant, fruits/bunch and fruits/plant, respectively. The earliest flower initiation and days to 50% flowering were recorded in VTG 4, while the earliest days to maturity was observed in VTG 27. The maximum number of primary and secondary branches were recorded in VTG 5. The highest plant height was observed in VTG 4 and reverse was true for VTG 22.

Yield was significantly and positively related with fruits/plant, number of primary branches, plant height and fruits/bunch, respectively (Table 2). This suggested that effective improvement in tomato yield through these three attributes could be achieved by simple recurrent selection. Bhutani and Kalloo (1), Padda *et al.* (6), Rattan *et al.* (7) and Srivastava and Sachan (8) have also reported positive association between number of fruits and yield. The highest significant positive correlation was observed between days to flower initiation and days to 50% flowering (0.95), followed by fruit length and width (0.87), fruits/plant and plant height (0.81), flower initiation and days to maturity (0.77), days to 50% flowering and days to maturity (0.73), plant height and fruits/bunch (0.71), yield and fruits/plant (0.70), fruits/bunch and fruits/plant (0.60). Furthermore, fruit width was significantly and negatively associated with fruits/plant, fruits/bunch and plant height thereby suggesting that an increase in fruit width would decrease these attributes and ultimately the yield. This suggests that while selecting for increased number of fruits/plant, fruits/bunch and plant height due emphasis

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