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Correlation and path co-efficient analysis for yield and its contributing traits in Tomato (*Solanum lycopersicum* L.)

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Abstract
Forty-three genotypes were studied for correlation and path co-efficient analysis in tomato (*Solanum lycopersicum* L.) at Horticultural Research centre, Department of Horticulture, Jawaharlal Nehru Krishi Vishwavidyalaya, Jabalpur (M.P.) during *Rabi* 2019-2020. The experiment was laid out in a Randomized Block Design (RBD) with three replications. Fruit yield had a positive significance correlation was associated with traits like average fruit weight, fruit length, number of fruits per plant, plant height at 120 DAT, days to 50% flowering and number of days to first picking. Strong association of these traits revealed that the selection based on these traits would ultimately improve the fruit yield. Hence, due weightage should be given to these characters while selecting the germplasm in crop improvement. In path coefficient analysis fruit yield per plant showed that number of fruits per plant, average fruit weight, number of fruits per cluster, number of primary branches per plant, fruit length, days to first flowering and fruit width observed positive direct effect at both genotypic and phenotypic level. These characters contribute maximum to high fruit yield compared to other characters, thus selection for these characters help in selection of superior tomato genotypes.

Keywords: Tomato, correlation, path co-efficient analysis

Introduction
Tomato (*Solanum lycopersicum* L.) is one of the most important vegetable crops of solanaceae family grown widely all over the world and believed to be originated from Central and South American (Vavilov, 1951) [28]. Naturally, the tomato is a perennial plant, but it is cultivated annually because of having a great economical and commercial advantages. It is typically a day neutral plant and self-pollinated crop, but certain percentage of cross pollination also occurs. It is a warm season crop reasonably resistant to heat and drought and grows under wide range of soil and climatic conditions.

It is universally treated as ‘Protective Food’. Ripe tomatoes are good source of minerals, antioxidants, organic acid, vitamin A, vitamin C and lycopene. It plays a vital role in maintaining health, vigor and very helpful in healing wounds because of the antibiotic properties found in the ripe fruit. Pulp and juice are very appetizing, easily digestible, promoters of gastric secretion, blood purifiers and have a pleasing and refreshing taste. Its production has increased tremendously due to its multifarious uses like raw for salad, cooked as vegetable and processed in many forms as soup, sauces, ketchups, preserves, paste and puree (Tiwari and Choudhury 1986) [27]. It is a very good source of income to small and marginal farmers and contributes to the nutrition of the consumers (Singh *et al.* 2010) [25].

In world, it ranks second in importance after potato, but tops the list of processed vegetables (Chaudhary, 1996) [2]. The major Tomato producing states in the country are Madhya Pradesh, Andhra Pradesh, Karnataka, Gujarat, Odisha, Chhattisgarh, West Bengal, Tamil Nadu, Bihar, Maharashtra, Uttar Pradesh, Haryana and Telangana. These states account for about 90% of the total production of the country. In addition to meeting the local demand tomato has been identified as a potential vegetable for export by APEDA. In India, it is grown in an area of 809 thousand ha. with production of 19697 thousand MT and M.P. covers an area of 100 thousand ha. and production of 3102 thousand MT. (Anonymous, 2018) [1].

Considering the potentiality of this crop, there is a need for improvement and to develop varieties suited to specific agro-ecological conditions and also for specific end use. A thorough knowledge regarding the amount of genetic variability existing for various characters is essential for initiating the crop improvement programme.

To give a better insight of ancillary characters under selection, correlation and path coefficient analysis are the tools, which are being effectively used for determining the rate of various yield components in different crops, leading to the selection of superior genotypes. Yield is a complex character controlled by large number of contributing characters and their interactions. A study of correlation between different quantitative characters provides an idea of association that could be effectively exploited to formulate selection strategies for improving yield components. Therefore, for a rational approach to the improvement of vegetable yield it is imperative to have information on the association among different yield components and their relative contribution to the yield and its components.

Material and Methods

The present investigation was conducted at Horticultural Research centre, Department of Horticulture, Jawaharlal Nehru Krishi Vishwavidyalaya, Jabalpur (M.P.) during *Rabi* 2019-2020. The experimental materials used in the study comprised of forty-three genotypes based on desirable phenotypic contrasting characters from different research institutes and evaluated for association analysis of fruit yield and its attributing traits in tomato. The experiment was laid out in a Randomized Block Design (RBD) with three replications. Appropriate agronomic practices were followed to raise a good crop. Five randomly taken plants were used to record observations on yield and yield attributing traits as plant height at 120 DAT, number of primary branches, days to first flowering, days to 50% flowering, number of flowers per cluster, number of fruits per cluster, number of days to first picking, fruiting span, percent fruit set, fruit length, fruit width, average fruit weight, number of fruits per plant and fruit yield per plant which included correlation co-efficient calculated for all quantitative character combinations at phenotypic and genotypic levels. Correlation analysis by the formula given by Miller *et al.* (1958) [16] and path co-efficient analysis developed by Wright (1921) [30] and elaborated by Dewey and Lu (1959) [4].

Results and Discussion

Correlation co-efficient analysis

Correlation coefficients were worked out at phenotypic, genotypic and environmental levels for all possible combination of thirteen characters (Table 1). Results indicated that genotypic correlation coefficient in general were of higher magnitude than the corresponding phenotypic correlation coefficient for all the characters. Plant height at 120 DAT showed highly significant and positive correlation with fruit width (0.419) followed by fruit length (0.326) and average fruit weight (0.277) whereas significant and positive association with days to 50% flowering (0.218) followed by number of days to first picking (0.217) and fruit yield per plant (0.193). Highly significant and negative association of this character was observed with fruiting span (-0.467) followed by number of flowers per cluster (-0.351) and number of fruits per cluster (-0.297). Number of primary branches per plant showed highly significant and positive correlation with percent fruit set (0.254). Highly significant and negative association of this character was observed with fruit yield per plant (-0.303) followed by number of fruits per plant (-0.286) whereas significant and negative association with days to 50% flowering (-0.195). Days to first flowering recorded highly significant and positive association with days to 50 per cent flowering (0.640) whereas significant and positive association with number of days to first picking (0.197) Days to 50 per cent flowering recorded significant and positive association with number of fruits per plant (0.190) followed by fruit yield per plant (0.180). Number of flowers per cluster showed highly significant and positive association with number of fruits per cluster (0.889) followed by number of fruits per plant (0.470) and fruiting span (0.422), whereas significant and positive association with percent fruit set (0.198). Highly significant and negative association of this character was observed with fruit width (-0.401). Number of fruits per cluster showed highly significant and positive correlation with percent fruit set (0.535) followed by number of fruits per plant (0.462) and fruiting span (0.402). Highly significant and negative association of this character was observed with fruit width (-0.338) whereas significant and negative association with average fruit weight (-0.206). Highly significant and positive association of days to first picking was observed with fruit length (0.448) followed by average fruit weight (0.371) and fruit width (0.235) whereas significant and positive association with fruit yield per plant (0.180). Significant and negative association of this character was observed with number of fruits per plant (-0.199). Association of fruiting span was recorded highly significant and negative with fruit width (-0.318) whereas significant and negative with fruit length (-0.199). Association of percent fruit set was recorded significant and negative with average fruit weight (-0.173). Fruit length recorded positive and highly significant association with average fruit weight (0.572) and fruit yield per plant (0.503) whereas significant and positive association with fruit width (0.207). Fruit width recorded positive and highly significant association with average fruit weight (0.471) whereas highly significant and negative association with number of fruits per plant (-0.465). Average fruit weight expressed highly significant and positive correlation with fruit yield per plant (0.669), while highly significant and negative association was with number of fruits per plant (-0.323). Number of fruits per cluster expressed highly significant and positive correlation with fruit yield per plant (0.428).

The results are in accordance with the findings of Parsanna *et al*. (2005) [20], Ghosh *et al*. (2010) [5], Izge *et al.* (2012) [7], Shashikanth *et al*. (2012) [23], Kumar *et al.* (2014) [12], Singh *et al.* (2015) [24] and Maurya *et al*. (2020) [14]. The trend of association observed in this study is mostly based upon the genetic contribution. Fruit yield per plant recorded highly significant and positive association with average fruit weight (0.669) followed by fruit length (0.503) and number of fruits per plant (0.428), while significant and positively correlated with plant height at 120 DAT (0.193) followed by days to 50% flowering (0.180) and number of days to first picking (0.180). However, it exhibited highly significant and negative association with number of primary branches per plant (-0.303). These results are in consonance with the findings of Dar *et al.* (2011) [3], Kaushik *et al.* (2011) [9], Kumar and Dudi (2011) [11], Mahapatra *et al*. (2013) [13] and Rathod *et al*. (2018) [22].

Path co-efficient analysis

The estimates of path coefficient are furnished in the Table 2 and Table 3. In general the genotypic direct as well as indirect effects were slightly higher in magnitude as compared to corresponding phenotypic direct and indirect effects.

Table 1: Correlation coefficient analysis (phenotypic and genotypic) among fruit yield and its components in tomato genotypes

Characters		Number of primary branches	Days to first flowering	Days to 50% flowering	Number of flowers/cluster	Number of fruits/cluster	Number of days to first picking	Fruiting span	Percent fruit set	Fruit length	Fruit width	Average fruit weight	Number of fruits/plant	Fruit yield/plant
Plant height at 120 DAT	G	0.085	0.125	0.266**	-0.361**	-0.334**	0.228**	-0.497**	0.002	0.327**	0.458**	0.279**	-0.106	0.210*
	P	0.070	0.098	0.218*	-0.351**	-0.297**	0.217*	-0.467**	-0.019	0.326**	0.419**	0.277**	-0.108	0.193*
Number of primary branches	G	1	-0.121	-0.213*	-0.154	-0.019	-0.020	-0.064	0.280**	-0.042	0.073	-0.051	-0.302**	-0.307**
	P		-0.126	-0.195*	-0.152	-0.026	0.021	-0.054	0.254**	-0.051	0.087	-0.053	-0.286**	-0.303**
Days to first flowering	G		1	0.831**	-0.066	-0.034	0.262**	-0.052	0.027	0.101	0.102	-0.006	0.101	0.096
	P			0.640**	-0.058	-0.044	0.197*	0.008	0.028	0.084	0.062	0.019	0.084	0.106
Days to 50% flowering	G			1	0.062	-0.016	0.191*	0.057	-0.159	0.104	0.094	0.013	0.167	0.217*
	P				0.015	-0.006	0.102	0.041	-0.062	0.075	0.082	-0.015	0.190*	0.180*
Number of flowers per cluster	G				1	0.928**	-0.044	0.482**	0.216*	0.083	-0.414**	-0.180*	0.501**	0.156
	P					0.889**	-0.031	0.422**	0.198*	0.096	-0.401**	-0.170	0.470**	0.164
Number of fruits per cluster	G					1	-0.074	0.438**	0.600**	0.003	-0.370**	-0.205*	0.472**	0.101
	P						-0.093	0.402**	0.535**	0.004	-0.338**	-0.206*	0.462**	0.091
Number of days to first picking	G						1	-0.089	-0.133	0.552**	0.261**	0.393**	-0.205*	0.204*
	P							-0.151	-0.092	0.448**	0.235**	0.371**	-0.199*	0.180*
Fruiting span	G							1	0.134	-0.237**	-0.319**	-0.178*	0.142	-0.072
	P								0.051	-0.199*	-0.318**	-0.154	0.150	-0.066
Percent fruit set	G								1	-0.117	-0.063	-0.165	0.137	-0.106
	P									-0.147	-0.036	-0.173*	0.129	-0.080
Fruit length	G									1	0.257**	0.583**	-0.041	0.524**
	P										0.207*	0.572**	-0.050	0.503**
Fruit width	G										1	0.516**	-0.500**	0.084
	P											0.471**	-0.465**	0.069
Average fruit weight	G											1	-0.320**	0.678**
	P												-0.323**	0.669**
Number of fruits per plant	G												1	0.452**
	P													0.428**

Significant at 5% level =* Significant at 1% level =**

Table 2: Genotypic path coefficient analysis for fruit yield and its components in tomato genotypes

Characters	Plant height (cm) 120 DAT	Number of primary branches	Days to first flowering	Days to 50% flowering	Number of flowers/cluster	Number of fruits/cluster	Number of days to first picking	Fruiting span	Percent fruit set	Fruit length	Fruit width	Average fruit weight	Number of fruits/plant	R with Fruit yield/plant
Plant height (cm) 120 DAT	-1.153	0.017	0.017	-0.022	0.139	-0.139	-0.008	0.0009	-0.001	0.045	0.0011	0.202	-0.086	0.210*
Number of primary branches	-0.098	0.194	-0.016	0.018	0.059	-0.008	0.001	0.0001	-0.074	-0.006	0.0002	-0.037	-0.243	0.307**
Days to first flowering	-0.145	-0.023	0.133	-0.069	0.025	-0.014	-0.009	0.0001	-0.007	0.014	0.0002	-0.004	0.082	0.096
Days to 50% flowering	-0.307	-0.041	0.111	-0.083	-0.024	-0.007	-0.006	-0.0001	0.042	0.014	0.0002	0.010	0.135	0.217*
Number of flowers per cluster	0.417	-0.030	-0.009	-0.005	-0.383	0.387	0.001	-0.0009	-0.057	0.011	-0.0010	-0.130	0.404	0.156
Number of fruits per cluster	0.385	-0.004	-0.005	0.001	-0.356	0.417	0.002	-0.0008	-0.158	0.000	-0.0009	-0.149	0.381	0.101
Number of days to first picking	-0.263	-0.004	0.035	-0.016	0.017	-0.031	-0.033	0.0002	0.035	0.075	0.0006	0.285	-0.165	0.204*
Fruiting span	0.573	-0.012	-0.007	-0.005	-0.185	0.183	0.003	-0.0018	-0.035	-0.032	-0.0007	-0.129	0.115	-0.072

Percent fruit set	-0.002	0.054	0.004	0.013	-0.083	0.250	0.004	-0.0002	-0.264	-0.016	-0.0002	-0.120	0.111	-0.106
Fruit length	-0.377	-0.008	0.014	-0.009	-0.032	0.001	-0.018	0.0004	0.031	0.136	0.0006	0.423	-0.033	0.524**
Fruit width	-0.529	0.014	0.014	-0.008	0.159	-0.154	-0.009	0.0006	0.017	0.035	0.0023	0.374	-0.404	0.084
Fruit weight	-0.322	-0.010	-0.001	-0.001	0.069	-0.086	-0.013	0.0003	0.044	0.079	0.0012	0.725	-0.258	0.678**
Number of fruits per plant	0.122	-0.059	0.013	-0.014	-0.192	0.197	0.007	-0.0003	-0.036	-0.006	-0.0012	-0.232	0.807	0.452**

Residual effect genotypic = 0.0371

Table 3: Phenotypic path coefficient analysis for fruit yield and its components in tomato genotypes

Characters	Plant height (cm) 120 DAT	Number of primary branches	Days to first flowering	Days to 50% flowering	Number of flowers/cluster	Number of fruits/cluster	Number of days to first picking	Fruiting span	Percent fruit set	Fruit length	Fruit width	Average fruit weight	Number of fruits/palnt	R with Fruit yield/plant
Plant height at 120 DAT	-0.059	-0.0002	0.0001	0.018	-0.090	0.111	-0.015	0.010	-0.003	0.030	-0.018	0.238	-0.074	0.193*
Number of primary branches	-0.004	-0.0032	-0.0002	-0.016	-0.039	0.010	-0.001	0.001	0.035	-0.005	-0.004	-0.046	-0.196	-0.303**
Days to first flowering	-0.006	0.0004	0.0013	0.052	-0.015	0.017	-0.013	0.000	0.004	0.008	-0.003	0.017	0.057	0.106
Days to 50% flowering	-0.013	0.0006	0.0008	0.081	0.004	0.002	-0.007	-0.001	-0.008	0.007	-0.004	-0.013	0.130	0.180*
Number of flowers per cluster	0.021	0.0005	-0.0001	0.001	0.257	-0.332	0.002	-0.009	0.027	0.009	0.017	-0.146	0.322	0.164
Number of fruits per cluster	0.018	0.0001	-0.0001	0.000	0.229	-0.374	0.006	-0.008	0.073	0.000	0.015	-0.177	0.316	0.091
Number of days to first picking	-0.013	-0.0001	0.0003	0.008	-0.008	0.035	-0.068	0.003	-0.013	0.042	-0.010	0.319	-0.136	0.180*
Fruiting span	0.028	0.0002	0.0000	0.003	0.109	-0.150	0.010	-0.021	0.007	-0.019	0.014	-0.132	0.102	-0.066
Percent fruit set	0.001	-0.0008	0.0000	-0.005	0.051	-0.200	0.006	-0.001	0.137	-0.014	0.002	-0.149	0.088	-0.080
Fruit length	-0.019	0.0002	0.0001	0.006	0.025	-0.001	-0.031	0.004	-0.020	0.093	-0.009	0.491	-0.034	0.503**
Fruit width	-0.025	-0.0003	0.0001	0.007	-0.103	0.126	-0.016	0.007	-0.005	0.019	-0.043	0.405	-0.318	0.069
Average fruit weight	-0.016	0.0002	0.0000	-0.001	-0.044	0.077	-0.025	0.003	-0.024	0.053	-0.020	0.859	-0.221	0.669**
Number of fruits per plant	0.006	0.0009	0.0001	0.015	0.121	-0.173	0.014	-0.003	0.018	-0.005	0.020	-0.277	0.684	0.428**

Residual effect genotypic = 0.058

Direct effect

Path coefficient analysis of different characters contributing towards fruit yield per plant showed that number of fruits per plant (0.807) had highest positive direct effect followed by average fruit weight (0.725), number of fruits per cluster (0.417), number of primary branches per plant (0.194), fruit length (0.136), days to first flowering (0.133) and fruit width (0.0023). Whereas, plant height at 120 DAT (-1.153) had the highest negative direct effect on fruit yield per plant followed by number of flowers per cluster (-0.383), percent fruit set (-0.264), days to 50% flowering (-0.083), days to first picking (-0.033) and fruiting span (-0.0018). These results were conformity with Verma and Sarnaik (2000) [29], Mohanty (2002) [17], Mehta and Asati (2008) [15] and Kumar *et al*. (2020) [10].

Indirect effect

Plant height at 120 DAT imparted highest positive indirect effect on fruit yield per plant via average fruit weight (0.202), number of flowers per cluster (0.139), fruit length (0.045), number of primary branches per plant (0.017), days to first flowering (0.017), fruit width (0.0011) and fruiting span (0.0009). However, indirect effect was negative via number of fruits per cluster (-0.139), number of fruits per plant (-0.086), days to 50% flowering (-0.022), number of days to first picking (-0.008) and percent fruit set (-0.001). Number of branches per plant was recorded to have positive indirect effect on fruit yield per plant through number of flowers per cluster (0.059), days to 50% flowering (0.018), fruit width (0.0002), number of days to first picking (0.0001) and fruiting span (0.0001). However, negative indirect effect was expressed via number of fruits per plant (-0.243), plant height at 120 DAT (-0.098), percent fruit set (-0.074), average fruit weight (-0.037), days to first flowering (-0.016), number of fruits per cluster (-0.008) and fruit length (-0.006). Days to first flowering revealed high values of positive indirect effect on fruit yield per plant through number of fruits per plant (0.082), number of flowers per cluster (0.025), fruit length (0.014), fruit width (0.0002) and fruiting span (0.0001). However, negative indirect effect was exhibited in the characters i.e. plant height at 120 DAT (-0.145), days to 50% flowering (-0.069), number of primary branches (-0.023), number of fruits per cluster (-0.014), number of days to first picking (-0.009), percent fruit set (-0.007) and average fruit weight (-0.004). Days to 50 per cent flowering expressed a positive indirect effect on fruit yield per plant through number of fruits per plant (0.135), days to first flowering (0.111), percent fruit set (0.042), fruit length (0.014), average fruit weight (0.010) and fruit width (0.0002). However, rest of the characters showed negative indirect effect *viz*., plant height at 120 DAT (-0.307), number of primary branches per plant (-0.041), number of flowers per cluster (-0.024), number of fruits per cluster (-0.007), number of days to first picking (-0.006) and fruiting span (-0.0001). Highest positive indirect effect of number of flowers per cluster on fruit yield per plant was recorded through plant height at 120 DAT (0.417), number of fruits per plant (0.404), number of fruits per cluster (0.387), fruit length (0.011) and number of days to first picking (0.001). However, negative indirect effect was exhibited via, average fruit weight (-0.130), percent fruit set (-0.057), number of primary branches per plant (-0.030), fruit width (0.0010), days to first flowering (-0.009), fruiting span (-0.0009) and days to 50% flowering (-0.005). Number of fruits per cluster expressed a positive indirect effect on fruit yield per plant through plant height at 120 DAT (0.385), number of fruits per plant (0.381), number of days to first picking (0.002), days to 50% flowering (0.001) and fruit length (0.000). However, high negative indirect effect exhibited via, number of flowers per cluster (-0.356), percent fruit set (-0.158), average fruit weight (-0.149), days to first flowering (-0.005), number of primary branched per plant (-0.004), fruit width (-0.0009) and fruiting span (-0.0008). Days to first picking revealed high values of positive indirect effect on fruit yield per plant through average fruit weight (0.285), fruit length (0.075), days to first flowering (0.035), percent fruit set (0.035), number of flowers per cluster (0.017), fruit width (0.0006) and fruiting span (0.0002). However, negative indirect effect was shown through plant height at 120 DAT (-0.263), number of fruits per plant (-0.165), number of fruits per cluster (-0.031), days to 50% flowering (-0.016) and number of primary branches per plant (-0.004). Fruiting span manifested highest positive indirect effect on fruit yield per plant through plant height at 120 DAT (0.573), number of fruits per cluster (0.183), number of fruits per plant (0.115) and number of days to fist picking (0.003). However, rest of the characters showed negative indirect effect *viz*., number of flowers per cluster (-0.185), average fruit weight (-0.129), percent fruit set (-0.035), fruit length (-0.032), number of primary branches per plant (-0.012), days to first flowering (-0.007), days to 50% flowering (-0.005) and fruit width (-0.0007). Percent fruit set manifested highest positive indirect effect on fruit yield per plant through number of fruits per cluster (0.250), number of fruits per plant (0.111), number of primary branches per plant (0.054), days to 50% flowering (0.013), days to first flowering (0.004) and number of days to first picking (0.004). However, rest of the characters showed negative indirect effect *viz*., average fruit weight (-0.120), number of flowers per cluster (-0.083), fruit length (-0.016), plant height at 120 DAT (-0.002), fruit width (-0.0002) and fruiting span (-0.0002). Fruit length revealed positive indirect effect on fruit yield per plant through average fruit weight (0.423), percent fruit set (0.031), days to first flowering (0.014), number of fruits per cluster (0.001), fruit width (0.0006) and fruiting span (0.0004). The remaining characters showed negative indirect effect via, plant height at 120 DAT (-0.377), number of fruits per plant (-0.033), number of flowers per cluster (-0.032), number of days to first picking (-0.018), days to 50% flowering (-0.009) and number of primary branches per plant (-0.008). Fruit width exhibited significant positive indirect effect via, average fruit weight (0.374), number of flowers per cluster (0.159), fruit length (0.035), percent fruit set (0.017), number of primary branches per plant (0.014), days to first flowering (0.014) and fruiting span (0.0006). Negative indirect effect was observed through plant height at 120 DAT (-0.529), number of fruits per plant (-0.404), number of fruits per cluster (-0.154), number of days to first picking (-0.009) and days to 50% flowering (-0.008). Average fruit weight manifested positive indirect effect on fruit yield per plant through fruit length (0.079), number of flowers per cluster (0.069), percent fruit set (0.044), fruit width (0.0012) and fruiting span (0.0003). However, rest of the characters showed negative indirect effect via, plant height at 120 DAT (-0.322), number of fruits per plant (-0.258), number of fruits per cluster (-0.086), number of days to first picking (-0.013), number of primary branches per plant (-0.010), days to first flowering (-0.001) and days to 50% flowering (-0.001). Number of fruits per plant exhibited positive indirect effect via, number of fruits per cluster

(0.197), plant height at 120 DAT (0.122), days to first flowering (0.013) and number of days to first picking (0.007). Negative indirect effect was observed through average fruit weight (-0.232), number of flowers per cluster (-0.192), number of primary branches per plant (-0.059), percent fruit set (-0.036), days to 50% flowering (-0.014), fruit length (-0.006), fruit width (-0.001) and fruiting span (-0.0003). Similar results were observed by Joshi *et al*. (2019) [8], Hossain *et al.* (2016) [6], Rahman *et al.* (2015) [21], Nagariya *et al.* (2015) [18], Srivastava *et al.* (2013) [26] and Prajapati *et al.* (2015) [19].

Conclusion

Fruit yield had a positive significance correlation was associated with traits like average fruit weight, fruit length, number of fruits per plant, plant height at 120 DAT, days to 50% flowering and number of days to first picking. Strong association of these traits revealed that the selection based on these traits would ultimately improve the fruit yield. Hence, due weightage should be given to these characters while selecting the germplasm in crop improvement. In path coefficient analysis fruit yield per plant showed that number of fruits per plant, average fruit weight, number of fruits per cluster, number of primary branches per plant, fruit length, days to first flowering and fruit width observed positive direct effect at both genotypic and phenotypic level. These characters contribute maximum to high fruit yield compared to other characters, thus selection for these characters help in selection of superior tomato genotypes.

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