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RESEARCH ARTICLE

Association studies on Yield and Yield Components in Snap Melon (*Cucumis Melo*. Var. *Momordica*)

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ABSTARCT

An experiment was carried out at Horticultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore to study the correlation analysis in snap melon. The study revealed that the traits fruit girth, fruit weight, number of primary branches, flesh thickness, number of female flowers per plant, fruit length, fruit girth, fruit weight, days to first harvest, number of fruits per plant, vine length, TSS, protein, carbohydrate, calcium, iron showed high positive significant correlation with fruit yield per plant. The traits such as days to first male flower appearance, node at which first female flower appearance and days to first harvest registered negative significant association with yield.

Keywords: *Snap melon; Correlation analysis; Traits*

INTRODUCTION

Snap melon (Cucumis melo var. momordica) is one of the important groups of Cucurbitaceous crop worldwide and play an important role in international trade. India being one of the secondary centre of origin of Cucumis melo var. momordica which comprises nearly 40 species. This is a potent crop, the fruits are rich in vitamin C, calcium and iron (Dhillon et al., 2014). It also possesses numerous nutraceutical and pharmaceutical properties. It is cultivated in various parts of the world including India and Pakistan. It is very popular in arid and semiarid regions. In North India snap melon is commonly called as 'Phoot' which means "To split". The large scale cultivation of 'phoot' is confined to the states of Uttar Pradesh, Rajasthan, Haryana, Punjab and Bihar in India. In Kerala it is called as Kanivellari (fruit cucumber) or Pottuvellari (split/ crack cucumber) and cultivated in Thrissur, Ernakulam and Malappuram districts of the state. In Tamil Nadu, it is grown in Ramanathapuram, Madurai, Virudhunagar, Tirunelveli, Villupuram, Karur and Pudukkottai districts.

The snap melon has many medicinal properties like antidiabetic, antioxidant activities and antihyperlipidemic activities (Yadav et al., 2022; Srivastava et al., 2020). There are several local varieties of melon grown in different regions of India. A wide range of variability is met from Gujarat in the west to West Bengal in the east.

Correlation analysis is important to determine the association between the yield and yield components. The obscure nature of yield is largely inclined by a number of component traits. Hence, information on the strength and direction of association of these component characters with yield and also inter-association among themselves will be very useful in formulating an effective and viable selection parameter for improvement of yield (Kumar *et al.,* 2023). An estimate of genotypic and phenotypic correlation coefficients gives a measure of genotypic association since it is an inherited relationship between the traits. The greater the magnitude of correlation coefficient, the stronger the association. After studying the correlation, selection pressure may be more easily exerted on any of the easily observable characters showing a close association with yield. Hence, the present investigation was planned to unravel the correlation of yield and yield attributing traits in snap melon.

MATERIALS AND METHODS

The experiment was carried out at Horticultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore.

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The experimental materials for the study consisted of six parents namely P1 (Amaravathi), P2 (Kothayapatti local), P3 (Thambipatti), P4 (Kariapatti), P5 (Gujarat local) and P6 (Thirumangalam long) and thirty hybrids were produced through full diallel mating design. The experiment was laid out in a Randomized Block Design. Each plot consisted of ten plants in a row at 60 x 60 cm inter and intra row spacing. All the recommended package of practices was adopted for raising a healthy crop. Five randomly selected plants, excluding the border ones, from each plot of all the two replications were tagged and used for recording the observations and average values were computed. The association between yield and components traits and among themselves was computed based on *per se* performance of the genotypes. Phenotypic correlation was worked out by the formulae recommended by Al-Jibouri *et al.* (1958).

Phenotypic correlation coefficient was computed using the following formula,

$$r_{ph}1.2=\frac{CO\ Vph\ 1.2}{(\sigma 2ph1+\sigma 2ph2)^{1}/_{2}}\times 100$$

Where,

rph 1.2 = phenotypic correlation coefficient between the traits 1 and 2

Co Vph 1.2 = phenotypic covariance between characters 1 and 2

σ2ph 1 = phenotypic variance for the character 1

σ2ph 2 = phenotypic variance for the character 2

RESULTS AND DISCUSSSION

Association of characters

The correlation coefficient between fruit yield and its components traits and inter correlation among the different yield attributes are presented in (Tables 1 to 3)

Correlation studies between fruit yield and its component traits

The correlation coefficient worked out among different characters including fruit yield revealed that in general, out of 34 characters studied fruit girth (0.520), fruit weight (0.508), recorded positive significant association in season 1, (Table 1.) with fruit yield, such a kind of positive significant association was quoted by Tomar *et al*. (2008), Ibrahim and Ramadan, (2013), Reddy *et al*. (2017) and Nanthakumar *et al.* (2021) in muskmelon and Pal *et al*. (2017) in cucumber. During season 2 (Table 2.) number of primary branches per plant (0.567), flesh thickness (0.431), number of female flowers per plant (0.635), fruit length (0.523), fruit girth (0.511), fruit weight (0.733), number fruits per plant (0.762), vine length (0.484), TSS (0.436), protein content (0.594), carbohydrate (0.673) and calcium (0.538) showed positive significant association with fruit yield. Negative significant association with yield for this season was recorded by node at which first female flower appearance (-0.531), days to first female flower appearance (-0.459) and days to first harvest (-0.705). Similar results were noticed by Singh *et al.* (2023) in bottle gourd.

For pooled mean (Table 3.), traits *viz*., number of primary branches (0.434), number of female flowers per plant (0.543), fruit girth (0.692), fruit weight (0.753), number of fruits per plant (0.678), vine length (0.585), protein (0.505), carbohydrate (0.512), calcium (0.649) and iron content (0.446) registered positive significant association with fruit yield. This result is in conformity with Nanthakumar *et al.* (2021) in muskmelon. The traits such as days to first male flower appear (-0.623) and days to first harvest (-0.526) registered negative significant association with yield. This is in agreement with the findings of Reddy *et al*. (2017) in muskmelon.

Also characters like node at which first male flower appear, node at which first female flower appear, days to first female flower appearance, stem thickness, acidity, reducing sugar, moisture, fibre, alkaloid, flavanoid and phenol content registered negative non-significant association with fruit yield. This is in agreement with the findings of Tomar *et al*. (2008).

The present study (Table 1, 2 & 3.) revealed that the traits fruit girth, fruit weight, number of primary branches, flesh thickness, number of female flowers per plant, fruit length, fruit girth, fruit weight, days to first harvest, number of fruits per plant, vine length, TSS, protein, carbohydrate, calcium, iron showed high positive significant correlation with fruit yield per plant. Hence during selection more weightage should be given for these traits for obtaining high fruit yield. Similar results were found by Ibrahim and Ramadan, (2013) in muskmelon, Bhoomika *et al.* (2021) in cucumber and Chauhan *et al.* 2023 in ridge gourd.

Table 1.Phenotypic correlation coefficients for qualitative and quantitative characters in snap melon for season 1

TRAITS	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16
X1	1															
X2	0.384	1														
X3	0.135	0.183	1													
X4	-0.438*	-0.206	-0.209	1												
X5	0.233	-0.099	-0.151	0.149	1											
X6	0.326	0.225	0.073	-0.176	-0.186	1										
X7	-0.064	-0.011	0.042	0.34	-0.089	0.298	1									
X8	0.286	0.097	0.354	-0.162	-0.415*	-0.058	-0.259	1								
X9	0.154	-0.106	0.218	-0.368	-0.156	-0.192	-0.175	0.214	1							
X10	0.374	0.09	0.267	-0.13	0	0.192	0.086	0.499*	-0.183	1						
X11	-0.183	0.081	0.154	-0.302	-0.179	0.212	-0.095	0.053	0.304	-0.085	1					
X12	0.328	0.098	0.276	-0.443*	-0.321	0.540*	0.034	0.006	0.373	0.057	0.094	1				
X13	0.347	0.104	0.601**	-0.336	-0.401	0.214	0.223	0.212	0.138	0.241	0.113	0.272	1			
X14	0.479*	0.457*	0.638**	-0.321	-0.215	0.419*	-0.066	0.404	0.1	0.346	0.291	0.348	0.638*	1		
X15	-0.171	0.074	-0.477*	0.022	0.258	-0.418*	-0.074	-0.096	0.028	-0.428*	-0.226	-0.394	-0.421*	-0.479*	1	
X16	0.559*	0.214	0.517*	-0.582**	-0.318	0.064	-0.161	0.407	0.478*	0.328	0.183	0.24	0.547**	0.571**	-0.278	1
X17	0.183	-0.049	0.392	-0.055	-0.129	0.034	0.053	0.288	0.294	0.341	0.077	0.147	0.329	0.446*	-0.375	0.614**
X18	-0.179	-0.025	-0.153	-0.028	-0.179	-0.277	-0.047	-0.103	-0.192	0.035	0.223	-0.516*	0.031	-0.136	-0.062	0.107
X19	-0.087	0.097	0.205	-0.341	-0.117	0.167	-0.025	0.104	-0.044	0.233	0.249	0.265	0.259	0.339	-0.107	0.107
X20	0.222	0.153	0.122	-0.221	-0.173	0.055	-0.135	-0.129	0.295	-0.215	-0.073	0.392	0.081	0.187	-0.226	0.229
X21	0.064	0.049	0.201	-0.295	0.207	0.036	-0.079	-0.112	-0.053	-0.048	-0.048	0.112	-0.078	-0.073	0.041	-0.038
X22	-0.252	-0.366	-0.261	-0.022	0.295	-0.259	0.158	-0.262	-0.012	-0.15	-0.105	-0.058	-0.201	-0.279	0.388	-0.175
X23	-0.06	-0.181	0.087	0.486*	-0.27	0.096	0.174	0.173	-0.127	0.06	-0.005	-0.052	-0.206	-0.125	-0.207	-0.103
X24	0.264	0.037	0.195	-0.044	0.106	0.41	0.325	-0.021	0.068	0.115	0.101	0.366	0.096	0.382	-0.223	-0.011
X25	-0.01	0.074	-0.143	0.211	-0.402	-0.164	0.044	-0.08	-0.117	-0.381	-0.366	-0.059	-0.093	-0.309	0.207	-0.268
X26	0.197	-0.079	0.511*	-0.529**	-0.308	0.186	-0.165	0.049	0.517*	-0.086	0.292	0.504*	0.478*	0.309	-0.375	0.397
X27	0.199	0.158	-0.205	-0.095	0.319	0.241	0.11	-0.420*	0.25	-0.283	0.09	0.174	-0.1	-0.023	0.338	0.045
X28	0.207	0.378	0.356	-0.101	0.071	0.296	-0.137	0.28	0.043	0.144	0.265	0.131	0.105	0.678**	-0.28	0.129
X29	-0.107	0.069	-0.219	0.003	-0.159	-0.151	0.066	-0.164	-0.187	-0.343	-0.225	-0.189	-0.05	-0.121	0.092	-0.19
X30	-0.023	0.121	-0.211	0.249	-0.047	0.4	0.027	0.164	-0.177	-0.021	0.017	0.149	-0.207	0.233	0.007	-0.362
X31	-0.169	0.02	0.15	-0.11	0.321	-0.022	-0.311	0.078	-0.254	0.277	0.159	-0.111	-0.207	0.123	-0.355	0.052
X32	-0.059	-0.307	0.470*	-0.369	-0.277	0.155	-0.064	0.196	0.467*	-0.163	0.336	0.530**	0.369	0.381	-0.307	0.265
X33	0.05	0.081	0.572	-0.387	0.009	0.114	-0.199	-0.061	0.395	-0.164	0.31	0.479*	0.373	0.332	-0.364	0.257
X34	0.038	0.273	0.486	-0.227	-0.264	0.019	0.136	0.146	-0.025	0.093	0.164	0.109	0.520*	0.508*	-0.074	0.313

Table 1 Continues…

TRAITS	X17	X18	X19	X20	X21	X22	X23	X24	X25	X26	X27	X28	X29	X30	31	X32	X33	X34
X17	1																	
X18	0.047	1																
X19	0.082	-0.091	1															
X20	0.229	0.035	0.068	1														
X21	-0.564**	-0.063	-0.068	0.008	1													
X22	-0.148	-0.128	0.189	-0.16	0.123	1												
X23	0.193	-0.136	-0.361	-0.295	-0.176	-0.107	1											
X24	0.126	-0.427*	0.131	0.3	-0.039	0.115	0.041	1										
X25	-0.319	0.288	-0.422*	0.069	0.143	-0.238	0.193	-0.374	1									
X26	0.155	0.006	0.247	0.458*	0.086	-0.203	-0.251	0.126	0.01	1								
X27	-0.052	-0.31	-0.09	-0.185	0.083	0.029	-0.121	-0.012	-0.072	-0.093	1							
X28	0.202	-0.042	0.142	0.187	0.087	-0.082	-0.04	0.284	-0.106	0.176	-0.079	1						
X29	-0.053	0.37	0.039	0.453*	-0.157	0.094	-0.198	0.033	0.371	0.062	-0.441*	0.155	1					
X30	0.079	-0.348	0.249	-0.049	-0.436*	-0.148	0.193	0.404	-0.029	-0.226	0.06	0.366	0.182	1				
X31	0.372	0.146	0.108	0.087	-0.093	-0.144	0.009	-0.012	-0.391	-0.072	-0.332	0.263	0.136	0.075	1			
X32	0.337	-0.13	0.182	0.284	-0.03	0.063	-0.087	0.332	-0.038	0.660**	-0.151	0.3	0.081	0.102	0.079	1		
X33	-0.123	-0.227	-0.071	0.272	0.512*	-0.073	-0.183	0.135	-0.1	0.586**	-0.003	0.238	-0.236	-0.418*	-0.025	0.470*	1	
X34	0.028	0.269	0.142	-0.016	0.238	0.061	-0.187	0.113	0.183	0.148	-0.138	0.248	-0.018	-0.181	-0.259	0.339	0.337	1

X1-Number of primary branches, X2- Node at which 1st male flower appearance, X3-Node at which 1st female flower appearance, X4-Days to 1st male flower appearance, X5-Days to 1st female flower appearance, X6-Internodal length, X7-Stem thickness, X8 -Peduncle length, X9-Flesh thickness, X10-Number of male flower appearance, X11-Number of female flower appearance, X12- Length of the fruit, X13- Girth of the fruit, X14-Weight of the fruit, X15-Days to first harvest, X16-Number of fruits per plant, X17-Vine length, X18-Total soluble solids, X19-Titrable acidity, X20-TSS/acid ratio, X21-Ascorbic acid,X22-Reducing sugar, X23-Non reducing sugar, X24-Carotene content, X25-Mositure content, X26-Protein content, X27-Fibre content, X28-Carbohydrate, X29-Alkaloid, X30-Flavanoid, X31-Phenolics, X32-Calcium content, X33-Iron content, X34-Yield

Table 2. Phenotypic correlation coefficients for qualitative and quantitative characters in snap melon for season 2

TRAITS	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16
X1	1															
X2	-0.064	1														
X3	0.342	0.353	1													
X4	-0.387	-0.014	0.343	1												
X5	-0.348	0	0.377	0.001	1											
X6	-0.119	0.015	-0.113	-0.071	0.147	1										
X7	0.29	-0.14	-0.178	0.052	0.072	0.234	1									
X8	0.121	-0.017	-0.263	-0.114	-0.143	0.063	-0.342	1								
X9	0.293	0.057	-0.417	0.103	-0.37	-0.084	-0.135	0.468*	1							
X10	-0.093	-0.444*	0.025	0.21	0.175	-0.1	-0.15	0.272	-0.146	1						
X11	0.401	-0.408	-0.423*	-0.223	-0.337	0.169	-0.091	0.298	0.244	0.276	1					
X12	0.218	-0.172	-0.633**	-0.258	-0.376	0.517*	0.177	0.135	0.365	-0.077	0.308	1				
X13	0.331	-0.252	-0.549**	-0.442*	-0.066	0.098	-0.179	0.486*	0.534**	0.07	0.445*	0.364	1			
X14	0.601**	-0.33	-0.451*	-0.237	-0.308	0.371	0.176	0.209	0.396	-0.2	0.544**	0.583*	0.408	1		
X15	-0.563**	0.134	0.173	0.197	0.26	-0.147	0.112	-0.111	-0.452	0.087	-0.484*	-0.32	-0.429	-0.599	1	
X16	0.269	-0.229	-0.489*	0.007	-0.603**	-0.049	-0.332	0.144	0.413	0.235	0.679**	0.34	0.318	0.349	-0.472	1
X17	0.096	-0.443*	-0.3	-0.059	-0.15	0.133	-0.026	-0.114	0.166	0.072	0.11	0.261	0.386	0.308	-0.307	0.334
X18	0.309	-0.041	-0.002	0.17	-0.441*	-0.209	-0.123	0.103	0.255	0.05	0.095	-0.018	0.151	0.13	-0.426	0.361
X19	-0.091	0.074	0.059	-0.317	-0.187	-0.139	-0.102	0.02	-0.13	-0.108	-0.062	0.181	-0.277	-0.123	0.165	-0.216
X20	0.168	0.13	-0.141	-0.034	-0.302	0.12	0.271	-0.22	-0.003	-0.295	-0.041	0.24	-0.225	0.151	-0.032	-0.085
X21	-0.059	0.151	0.135	-0.041	0.374	0.048	-0.206	0.286	0.037	0.31	0.22	-0.086	0.143	-0.04	-0.053	0.108
X22	-0.235	0.265	0.171	-0.356	0.178	-0.179	-0.362	-0.275	-0.202	-0.254	-0.322	-0.081	0.128	-0.221	0.034	-0.167
X23	0.354	-0.002	-0.118	-0.349	-0.347	0.051	0.154	-0.265	-0.172	-0.11	0.122	0.125	0.065	-0.028	-0.279	0.082
X24	0.11	-0.243	0.122	-0.126	0.072	0.181	0.304	-0.047	-0.163	-0.128	0.317	0.08	-0.194	0.342	-0.064	-0.284
X25	-0.071	0.364	0.036	-0.132	-0.214	-0.143	-0.141	0.163	-0.005	-0.351	-0.145	-0.232	-0.107	-0.318	0.305	-0.208
X26	0.480*	-0.358	-0.522*	-0.133	-0.243	0.029	0.144	0.134	0.605**	-0.214	0.338	0.578**	0.408	0.693**	-0.586**	0.296
X27	-0.325	0.366	0.196	0.196	0.195	0.071	0.104	-0.226	0.11	-0.096	-0.169	0.074	-0.015	-0.106	0.052	-0.127
X28	0.348	-0.083	-0.23	-0.27	-0.159	0.071	-0.141	-0.04	0.145	-0.012	0.343	0.18	0.066	0.447*	-0.376	0.556**
X29	-0.08	0.229	-0.085	0.007	-0.215	-0.365	-0.173	0.044	0.04	-0.31	-0.301	-0.106	-0.312	-0.196	0.166	-0.05
X30	-0.108	-0.184	-0.124	0.031	-0.014	0.034	0.149	-0.156	-0.156	0.04	-0.095	0.219	-0.28	0.103	0.218	-0.033
X31	-0.134	-0.07	0.007	0.088	-0.106	0.212	-0.335	0.084	-0.317	0.526**	0.303	0.053	-0.267	-0.12	0.046	0.448*
X32	0.271	-0.277	-0.682**	-0.501*	-0.136	0.437*	0.004	0.123	0.245	-0.361	0.372	0.569**	0.442*	0.615**	-0.428*	0.272
X33	0.239	0.177	-0.402	-0.388	-0.235	0.408	0.011	0.044	0.155	-0.353	0.3	0.433*	0.309	0.324	-0.103	0.238
X34	0.597**	-0.29	-0.531**	-0.341	-0.495*	0.122	-0.10028	0.068	0.431*	-0.01326	0.635**	0.523*	0.511*	0.733**	-0.705**	0.762**

Table 2 Continues…

TRAITS	X17	X18	X19	X20	X21	X22	X23	X24	X25	X26	X27	X28	X29	X30	31	X32	X33	X34
X17	1																	
X18	0.329	1																
X19	-0.268	-0.389	1															
X20	-0.154	0.255	0.048	1														
X21	-0.152	-0.113	-0.084	-0.512*	1													
X22	-0.039	-0.114	0.052	0.054	-0.086	1												
X23	0.326	0.392	0.101	0.485*	-0.456*	0.031	1											
X24	-0.394	-0.3	0.455*	0.265	0.006	-0.144	-0.069	1										
X25	-0.213	-0.002	0.29	0.174	-0.419*	-0.137	0.313	-0.106	1									
X26	0.167	0.291	-0.045	0.266	-0.055	-0.151	-0.009	0.264	-0.293	1								
X27	-0.001	-0.132	-0.074	-0.057	0.2	0.384	-0.244	-0.054	-0.247	-0.144	1							
X28	0.121	0.133	-0.197	0.01	0.196	-0.096	-0.137	-0.082	-0.247	0.289	-0.228	1						
X29	-0.289	0.159	0.238	0.359	-0.184	0.019	-0.037	-0.098	0.441*	0.088	-0.214	0.21	1					
X30	-0.19	-0.399	0.167	0.22	-0.194	0.061	-0.292	0.139	-0.143	0.028	-0.024	0.334	0.428	1				
X31	-0.123	0.093	0.015	0.021	0.174	-0.183	0.028	-0.075	-0.067	-0.261	-0.295	0.387	0.101	0.172	1			
X32	0.351	-0.063	0.02	0.236	-0.118	0.005	0.227	0.16	-0.057	0.582*	-0.304	0.301	0.031	0.011	-0.042	1		
X33	0.188	-0.05	0.027	0.158	0.142	-0.008	0.301	0.039	0.032	0.205	-0.148	0.06	-0.282	-0.38	-0.014	0.598**	1	
X34	0.484*	0.436*	-0.249	0.175	-0.057	-0.022	0.266	-0.071	-0.29	0.594**	-0.125	0.673**	-0.117	0	0.156	0.538**	0.325	1

X1-Number of primary branches, X2- Node at which 1st male flower appearance, X3- Node at which 1st female flower appearance, X4-Days to 1st male flower appearance, X5-Days to 1st female flower appearance, X6-Internodal length, X7-Stem thickness, X8 -Peduncle length, X9-Flesh thickness, X10-Number of male flower appearance, X11-Number of female flower appearance, X12- Length of the fruit, X13- Girth of the fruit, X14-Weight of the fruit, X15-Days to first harvest, X16-Number of fruits per plant, X17-Vine length, X18-Total soluble solids, X19-Titrable acidity, X20-TSS/acid ratio, X21-Ascorbic acid,X22-Reducing sugar, X23-Non reducing sugar, X24-Carotene content, X25-Mositure content, X26-Protein content, X27-Fibre content, X28-Carbohydrate, X29-Alkaloid, X30-Flavanoid, X31-Phenolics, X32-Calcium content, X33-Iron content, X34-Yield

Table 3. Phenotypic correlation coefficients for qualitative and quantitative characters in snap melon for pooled mean

TRAITS	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16
X1	1															
X2	0.218	1														
X3	-0.062	0.692**	1													
X4	-0.402	-0.132	0.281	1												
X5	-0.277	-0.054	0.225	0.235	1											
X6	0.152	0.121	-0.046	-0.155	-0.086	1										
X7	0.06	-0.125	-0.136	0.21	0.011	0.205	1									
X8	0.325	-0.004	-0.204	-0.239	-0.333	-0.11	-0.346	1								
X9	0.418*	0.056	-0.281	-0.282	-0.325	0.009	-0.103	0.271	1							
X10	0.219	-0.351	-0.168	0.032	0.118	-0.034	-0.061	0.417*	-0.17	1						
X11	0.062	-0.14	-0.259	-0.345	-0.263	0.096	-0.168	0.347	0.293	0.143	1					
X12	0.334	-0.059	-0.488*	-0.495*	-0.334	0.511*	0.105	0.117	0.450*	0.008	0.279	1				
X13	0.574**	-0.103	-0.495*	-0.571**	-0.316	0.145	0.001	0.371	0.429*	0.132	0.26	0.408	1			
X14	0.595**	-0.041	-0.338	-0.401	-0.265	0.378	0.071	0.329	0.294	0.118	0.541**	0.509*	0.619**	1		
X15	-0.535*	0.118	0.208	0.261	0.349	-0.336	-0.026	-0.16	-0.279	-0.211	-0.524*	-0.399	-0.432*	-0.636**	1	
X16	0.504*	-0.029	-0.365	-0.438*	-0.406	0.027	-0.303	0.331	0.575**	0.263	0.514**	0.281	0.611**	0.531**	-0.581**	1
X17	0.21	-0.377	-0.494*	-0.088	-0.267	0.163	-0.002	0.047	0.251	0.283	0.226	0.284	0.502*	0.518*	-0.485*	0.662**
X18	0.152	0.004	0.063	0.048	-0.337	-0.279	-0.102	0.068	0.071	0.167	0.209	-0.264	0.2	0.086	-0.459*	0.428*
X19	-0.105	-0.14	-0.126	-0.355	-0.291	0.061	-0.055	0.018	-0.139	0.022	0.15	0.315	-0.119	-0.017	0.072	-0.202
X20	0.166	0.146	-0.116	-0.112	-0.287	0.123	0.102	-0.131	0.158	-0.267	0.009	0.33	0.015	0.187	-0.162	0.108
X21	-0.035	0.273	0.245	-0.411	0.378	-0.169	-0.184	0.076	0.013	0.048	0.299	-0.077	-0.023	-0.094	0.195	-0.096
X22	-0.155	-0.151	0.09	-0.266	0.286	-0.2	-0.097	-0.432*	-0.093	-0.209	-0.249	-0.116	-0.116	-0.238	0.239	-0.106
X23	0.048	-0.073	0.02	0.066	-0.578**	0.149	0.153	-0.19	-0.167	-0.061	0.039	0.074	-0.072	0.013	-0.374	0.102
X24	0.212	-0.198	-0.113	-0.09	0.11	0.265	0.408	-0.043	-0.036	-0.043	0.215	0.288	-0.034	0.446*	-0.15	-0.193
X25	-0.054	0.267	0.155	0.015	-0.342	-0.096	-0.053	-0.003	-0.085	-0.427*	-0.332	-0.16	-0.125	-0.333	0.291	-0.284
X26	0.422*	-0.239	-0.586**	-0.450*	-0.347	0.076	-0.02	0.171	0.541**	-0.147	0.469*	0.601**	0.581**	0.568**	-0.606**	0.454*
X27	0.092	0.342	0.277	0.083	0.274	0.205	0.126	-0.354	0.314	-0.206	-0.069	0.109	-0.061	-0.053	0.182	0.021
X28	0.296	0.185	-0.034	-0.302	0.032	0.212	-0.134	0.112	0.039	0.065	0.361	0.163	0.072	0.630**	-0.381	0.343
X29	-0.096	0.17	0.035	-0.01	-0.224	-0.08	-0.073	-0.133	-0.217	-0.377	-0.326	-0.181	-0.221	-0.178	0.178	-0.193
X30	-0.091	-0.03	-0.058	0.135	0.028	0.397	0.09	-0.051	-0.284	-0.005	-0.126	0.201	-0.307	0.176	0.169	-0.255
X31	-0.196	-0.071	-0.066	-0.032	0.121	0.102	-0.359	0.08	-0.317	0.414*	0.272	-0.018	-0.281	0.008	-0.168	0.182
X32	0.105	-0.425*	-0.677**	-0.527**	-0.278	0.267	0.111	0.095	0.241	-0.176	0.558**	0.556**	0.434*	0.639**	-0.516*	0.331
X33	0.1	0.138	-0.227	-0.458*	-0.136	0.074	-0.104	0.112	0.429*	-0.317	0.403	0.468*	0.430*	0.381	-0.258	0.247
X34	0.434*	-0.098	-0.375	-0.623**	-0.317	0.085	-0.003	0.177	0.277	0.068	0.543**	0.33	0.692**	0.753**	-0.526**	0.678**

Table 3. Continues…

TRAITS	X17	X18	X19	X20	X21	X22	X23	X24	X25	X26	X27	X28	X29	X30	31	X32	X33	X34
X17	1																	
X18	0.379	1																
X19	-0.184	-0.218	1															
X20	0	0.177	0.069	1														
X21	-0.503*	-0.192	0.175	-0.255	1													
X22	-0.068	-0.246	0.279	-0.091	0.093	1												
X23	0.223	0.205	0.129	0.156	-0.326	-0.061	1											
X24	-0.207	-0.367	0.177	0.304	-0.015	0.143	-0.14	1										
X25	-0.279	-0.007	0.014	0.136	-0.066	-0.249	0.352	-0.341	1									
X26	0.279	0.202	0.136	0.404	-0.109	-0.121	-0.048	0.292	-0.117	1								
X27	0.033	-0.266	-0.137	-0.151	0.105	0.167	-0.284	-0.038	-0.182	-0.162	1							
X28	0.262	0.105	0.033	0.116	0.101	-0.144	-0.111	0.232	-0.19	0.245	-0.158	1						
X29	-0.195	0.238	0.207	0.450*	-0.315	-0.009	-0.047	-0.014	0.423	0.097	-0.344	0.213	1					
X30	-0.03	-0.462*	0.308	0.089	-0.323	-0.053	-0.145	0.437	-0.099	-0.122	0.037	0.338	0.37	1				
X31	0.081	0.248	0.003	0.052	0.132	-0.192	0.024	-0.113	-0.267	-0.122	-0.332	0.389	0.113	0.133	1			
X32	0.423*	-0.026	0.254	0.223	-0.098	0.079	0.144	0.39	-0.169	0.700**	-0.267	0.386	-0.001	0.092	0.026	1		
X33	0.023	-0.058	-0.03	0.198	0.427*	-0.094	0.059	0.015	-0.02	0.471*	-0.125	0.163	-0.299	-0.408	-0.037	0.466*	1	
X34	0.585**	0.282	-0.06	0.165	0.063	-0.023	0.166	0.154	-0.103	0.505*	-0.178	0.512*	-0.135	-0.159	-0.017	0.649**	0.446*	1

X1-Number of primary branches, X2- Node at which 1st male flower appearance, X3- Node at which 1st female flower appearance, X4-Days to 1st male flower appearance, X5-Days to 1st female flower appearance, X6-Internodal length, X7-Stem thickness, X8 -Peduncle length, X9-Flesh thickness, X10-Number of male flower appearance, X11-Number of female flower appearance, X12- Length of the fruit, X13- Girth of the fruit, X14-Weight of the fruit, X15-Days to first harvest, X16-Number of fruits per plant, X17-Vine length, X18-Total soluble solids, X19-Titrable acidity, X20-TSS/acid ratio, X21-Ascorbic acid,X22-Reducing sugar, X23-Non reducing sugar, X24-Carotene content, X25-Mositure content, X26-Protein content, X27-Fibre content, X28-Carbohydrate, X29-Alkaloid, X30-Flavanoid, X31-Phenolics, X32-Calcium content, X33-Iron content, X34-Yield

Inter correlation among important yield attributing components for two seasons

The inter correlation among component characters (Table 1, 2 & 3.) revealed significant positive correlation of number of primary branches with flesh thickness, fruit girth, fruit weight, number of fruits per plant, protein and yield, node at which first male flower appear with node at which first female flower appear and fruit weight, internodal length with fruit length, fruit weight and calcium content, flesh thickness with length and fruit girth, number of fruits per plant, protein content, calcium, iron and fruit yield per plant, number of male flowers per plant with phenol content, number of female flowers per plant with fruit girth, fruit weight, number of fruits, protein and calcium, fruit length with fruit weight, protein, calcium, iron, fruit girth with weight, number of fruits, vine length, calcium, protein and iron, fruit weight with number of fruits per plant, vine length, carbohydrate, carotene, calcium and protein content, vine length with calcium, TSS/acid ratio with protein, alkaloid and non-reducing sugar, ascorbic acid with iron, protein with calcium and iron, calcium with iron content.

CONCLUSION

The present study revealed that the traits fruit girth, fruit weight, number of primary branches, flesh thickness, number of female flowers per plant, fruit length, fruit girth, fruit weight, days to first harvest, number of fruits per plant, vine length, TSS, protein, carbohydrate, calcium, iron showed high positive significant correlation with fruit yield per plant. Hence during selection more weightage should be given for these traits for obtaining high fruit yield.

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Authors contribution

Experiments-Muthuselvi R and Praneetha S, Writing-Kousalya R and Muthuselvi R, Reviewing and editing- Praneetha S

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