Short Communication

Path analysis for yield and its components in quinoa (*Chenopodium quinoa* Willd)

RAJENDRA KUMAR YADAV*

Department of Genetics and Plant Breeding, Indira Gandhi Krishi Vishwavidyalaya Raipur 492012 Chhattisgarh, India

*Email for correspondence: yadavrk98@gmail.com

 Received: 01.05.2024/Accepted: 07.07.2024

ABSTRACT

A study conducted with seventeen promising genotypes of quinoa indicated that biological yield per plant exhibited positive direct effect on seed yield per plant followed by harvest index, days to 50 per cent flowering and inflorescence diameter. Selection based on these characters would be effective for improving yield in quinoa.

Keywords: Quinoa; characters; genotypes; path

INTRODUCTION

Quinoa (*Chenopodium quinoa* Willd) is an important under-utilized pseudo-cereal for better health and nutrition. Its acreage and production in Chhattisgarh and even in India is still unknown. However, expected potential of its seed yield is 12-15 q per ha (Yadav 2018). Little information is available on quinoa crop regarding path analysis.

MATERIAL and METHODS

Seventeen promising genotypes of quinoa with one national check (Himpriya) were grown in RBD with 3 replications at the research farm of Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh during rabi season 2021-2022. Seed material for the present investigations was received from different coordinating centres of potential crops. Plot size for each entry representing single replication was 3 m^2 with spacing of 30 cm x 30 cm. Recommended package of practices was followed and observations were recorded from five plants of each genotype. Path analysis was done as per Dewey and Lu (1959).

RESULTS and DISCUSSION

At genotypic level, seed yield per plant had significant and positive correlation with biological yield per plant, harvest index, seed volume, inflorescence diameter, number of branches per plant, inflorescence length and stem diameter (Table1).

Similar observation was reported by Yadav (2021) for stem diameter in quinoa. In the path coefficient analysis, biological yield per plant indicated the highest positive direct effect on seed yield per plant followed by harvest index, days to 50 per cent flowering and stem diameter. Rest of the traits showed low, positive and negative direct and indirect effects on seed yield per plant. Similar finding has also been reported by Bhargava et al (2003) for biological yield per plant in *Chenopodium*.

Hence, these characters would be advantageous for achieving higher yield in quinoa especially in future breeding programmes.

REFERENCES

Bhargava A, Shukla S, Katiyar RS and Ohri D 2003. Selection parameters for genetic improvement in *Chenopodium* grain yield in sodic soil. Journal of Applied Horticulture **5(1):** 45-48.

Dewey DR and Lu KH 1959. A correlation and path-coefficient analysis of components of crested wheatgrass seed production. Agronomy Journal **51(9):** 515-518.

Table 1. Genotypic path analysis for yield and its traits in quinoa

Character	Days to 50% flowering	Days to maturity	Plant height (cm)	Leaf length (cm)	Stem diameter (cm)	Number of secondary branches/plant	Inflorescence length (cm)
	1	2	3	4	5	6	7
1	0.097	0.026	0.005	–0.050	–0.002	–0.004	0.006
2	0.087	0.029	0.013	–0.050	–0.006	–0.001	0.008
3	0.012	0.009	0.039	0.013	–0.013	0.010	0.009
4	–0.064	–0.019	0.007	0.076	–0.006	0.006	–0.004
5	0.002	0.002	0.005	0.005	–0.092	0.012	0.004
6	0.002	0.001	–0.002	–0.001	–0.058	0.018	–0.003
7	0.039	0.015	0.023	–0.021	–0.022	0.001	0.016
8	–0.026	–0.005	0.011	0.026	–0.023	0.009	0.002
9	0.048	0.017	0.023	–0.019	–0.024	0.012	0.004
10	0.011	0.008	0.015	–0.011	–0.047	0.019	0.007
11	–0.029	–0.010	–0.001	0.004	–0.009	–0.001	0.001
12	–0.021	–0.009	–0.010	0.023	0.004	–0.004	0.002

Table 1. Contd…..

Character	Inflorescence diameter (cm)	Number of inflorescence /plant	Biological yield /plant (g)	Seed volume (g/10 ml)	Harvest index (%)	Genotypic correlation 'r'
	8	9	10	11	12	-
1	–0.025	–0.106	0.081	–0.011	–0.118	–0.104
2	–0.016	–0.128	0.191	–0.013	–0.177	–0.068
3	0.025	–0.127	0.272	–0.001	–0.134	0.097
4	0.032	0.054	–0.106	0.002	0.161	0.120
5	0.024	–0.055	0.363	0.003	–0.023	0.302*
6	0.022	–0.082	0.358	–0.001	–0.074	0.267
7	0.015	–0.054	0.296	0.002	0.078	0.364**
8	0.093	–0.009	0.122	0.010	0.222	0.464**
9	0.004	–0.215	0.222	–0.020	–0.328	–0.250
10	0.016	–0.068	0.704	0.007	–0.003	0.702**
11	0.027	0.121	0.135	0.036	0.286	0.569**
12	0.039	0.134	–0.004	0.019	0.525	0.696**

*Significant at 5% LoS, **Significant at 1% LoS; Residual effect = 0.002

Yadav RK 2018. Annual progress report. Submitted to All India Coordinated Research Network on Potential Crops, ICAR – National Bureau of Plant Genetic Resources, New Delhi, India, 3p.

Yadav RK 2021. Genetic parameters and their association with grain yield in quinoa (*Chenopodium quinoa* Willd) under late sown condition. International Journal of Farm Sciences **11(3):** 37-39.