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Stability analysis for seed yield in pigeonpea

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Abstract
Eleven genotypes of pigeonpea were grown in four environments and seed yield data analyzed for stability parameters. Highly significant mean square were observed for genotypes, genotypes x Environment interaction and environment (linear). AAUDT 102-4-1, ICPL 81-3and ICPL 151. Were the most stable genotypes under rainfed situation of Assam as theses had high mean, regression coefficient not deviated from unity and non significant minimum deviation from regression.

Keywords: Stability, genotype x environment, pigeonpea, *Cajanus cajan*

Introduction
Pigeonpea (*Cajanus cajan* L.) is an important crop of hills zone of Assam. Traditionally farmers cultivate pigonpea in border of the cultivating areas as well as as a monocrop. The farmers of Assam generally cultivate long duration pigeonpea variety 'T21' since long back. With the increase of population and demand of pigeonpea there is an urgent need of early duration pigeonpea variety with high yield potential, which have enabled double cropping in the state. Being a rainfed crop, the yield of pigeonpea fluctuates with seasons due to sensitivity of genotypes to the growing conditions. For that reason, the information on stability of the varieties in the crop is important from breeding as well as cultivation point of view. Literature on phenotypic stability in the pigeonpea crop is scanty in the state.

Eleven promising genotypes of pigeonpea were testing during kharif 2015-16, 2016-17, 2017-18 and 2018-19 under rainfed condition at Regional Agricultural Research Station, Diphu, Assam. The experiment was laidout in a randomized block design with 3 replications in each year. The plot consisted of 4 rows of 5 m length with a spacing of 60 cm x 30 cm between rows and plants. For cultivation of the crop recommended package of practices was followed. The seed yield data per plot were recoded in all the four years. Statistical analysis was carried out separately for each year and for pooled data. Since the error variance were homogenous, stability parameter was computed on the basis of mean performance over years as per model given by Eberhart and Russell (1966) [1].

Year (environment) wise analysis revealed that significant differences existed among genotypes under each year. Pooled analysis indicated that genotypes and genotype x environment interaction were highly significant. The linear component of GxE interaction revealed that the amount of variability existed not only among genotypes but also the environments. The Significant G X E also indicated that regression co-efficient (bi) were not of the same order.

The stability parameters i.e. mean (Xi), regression coefficient (bi) and deviation from regression (S2di) of each genotype for the character studied. The general mean yield of pigeonpea was 1373kg/ha with a range from 1225 (ICPL 88034) to 1615kg/ha (AAUDA 102-4-2). It was observed that yield trend was almost similar in different years.

The regression coefficient (bi) varied from -1.31 (ICPL11330) to +2.53 (ICPL11305). The regression co-efficient was significant for three genotypes AAUDT 102-4-1, ICPL 81-3and ICPL 151 and remaining genotypes regression coefficient were non significant. The regression co-efficient of four genotypes *viz*., +2.53 (ICPL 11305), +1.72 (ICPL 87), -.0.62 (ICPL 161) and -1.31 (ICPL 11330) significantly deviated from unity while remaining regression coefficient did not deviate from unit value of regression. Out of eleven genotypes, eight genotypes had significant S^2di for seed yield. The genotypes AAUDT 102-4-1, ICPL 81-3and ICPL 151exhibited non-significant minimum value of S^2di.

Based on the individual parameters of stability (Xi, bi and S2di) the genotypes AAUDA102-4-1 (1615kg/ha), ICPL 81-3 (1458kg/ha) and ICPL 151 (1438kg/ha) exhibited better seed yield

performance, did not deviate from unit regression coefficient and had non significant minimum deviation(S2di). These findings are in accordance with Tyagi and Agarwal (1995), Roy and Sarma (1996), Vannirajan *et al*., (2007); Patel *et al*., (2009); Thanki *et al*., (2010); Sawargaonkar *et al*., (2011), Niranjan Kumar (2013) and Ramesh *et al*. 2017 [8, 5, 9, 3, 7, 6, 2, 4] in pigeonpea. Thus AAUDT 102-4-1, ICPL 81-3and ICPL 151 genotypes will help in improving the productivity of the pigeonpea and also help the farmers in adopting early maturing cultivar in winter cultivation.

Table 1: Show the variety

Sl. No.	Variety	Yield (kg/ha)					bi	S^2di
		2015-16	2016-17	2017-18	2018-19	Xi		
1	Maruti	1410	1470	1420	1400	1425	+1.05	+39122**
2	ICPL 88039	1390	1430	1470	1340	1408	+1.22	+47133**
3	ICPL 161	1160	1180	1380	1280	1250	-0.62^{+}	+30014**
4	ICPL 81-3	1430	1480	1510	1410	1458	+1.41	-89^{NS}
5	ICPL 11330	1210	1420	1430	1470	1380	-1.31^{+}	+4391**
6	ICPL 88034	1180	1250	1250	1220	1225	+1.08	+2344**
7	ICPL 87091	1340	1350	1340	1320	1338	+1.04	+4896**
8	ICPL 87	1450	1260	1260	1250	1305	+1.72^{+}	+4765**
9	ICPL 151	1240	1430	1580	1500	1438	+1.44	-94^{NS}
10	AAUDA 102-4-2	1580	1750	1550	1580	1615	+1.40	-69^{NS}
11	ICPL 11305	1180	1320	1290	1270	1265	+2.53^{+}	+24648**
	G.M	1325	1395	1407	1367	1373		
	S.E.(Xi)	21	18	19	20	49		
	SE(bi)						0.34	

*P=0.05 and 0.01, respectively

+Denotes deviation from regression co-efficient from unity

References

1. Eberhart SA, Russell WA. Stability parameters for comparing varieties. Crop Science 1966;6:36-40.
2. Niranjankumara B. Stability analysis for yield and its attributing traits in advanced genotypes of pigeonpea [*Cajanus cajan* (L) Mill sp.] M.Sc.(Agri) Thesis, UAS, Raichur, Karnataka, India 2013.
3. Patel PT, Chauhan RM, Parmar LD, Tikka SBS. Phenotypic stability of yield and related traits in pigeonpea. Leg. Res 2009;32(4):235-239
4. Ramesh, Muniswamy S, Praveenkumar B. Stability analysis for yield and its components in pigeonpea [*Cajanua cajan* (L.) Mill sp] under rainfed conditions. Int. J Curr. Microbiol. App. Sci 2017;6(5):1134-1144.
5. Roy A, Sarma RN. Phenotypic stability for yield and maturity in pigeonpea (*Cajanus cajan*). Indian Journal of Agricultural Science 1996;66(8):494-6.
6. Sawargaonkar SL, Saxena KB, Madrap IA, Rathore A. Stability analysis of yield and related traits in pigeonpea hybrids. J. Food Leg 2011;24(3):184-193
7. Thanki HP, Sawargaonkar SL, Hudge BV. Genotype X Environment Interaction for biomatriic traits in pigeonpea [*Cajanus cajan* (L.) Mill sp] under varying spacing. Elec. J. Pl. Breeding 2010;1(4):925-928.
8. Tyagi PC, Agarwal MC. Phenotypic stability for seed yield in Pigeonpea. Indian J. Genet 1995;55(2):148-150
9. Vanniranjan C, Rangasamy P, Nepolean T. Stable and unstable pigeonpea genotypes for yield versus component characters. Pl. Arch 2007;7(1):427-428.