البحث الرابع

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MULTIVARIATE STATISTICAL ANALYSISOFFABA BEANYIELD AND YIELD COMPONENTS

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ABSTRACT

Two field experiments were conducted at Sdmentelgabal, Beni-Suef Governorate during the two winter seasons of 2011/2012 and 2012/2013 to evaluate the performance of five faba bean varieties (Giza 2, Giza 40, Giza 429, Giza 843, and Misr1) for seed yield and related traits. Five statistical procedures ,*i.e*., descriptive statistics, simple correlation, multiple linear regression, stepwise regression, factor analysis and path analysis were applied to determine the relationship between faba bean seed yield and its components.

Highly significant and positive associations were detected between seed yield (g/plant) and each of plant height, number of pods/plant and harvest index.

From the multiple linear regression analysis revealed that plant height, number of seed/ pod, weight of seeds/pod, 100seeds weight and harvest index were significantly contributing to seed yield. Stepwise analysis indicated that plant height, number of pods/plant, harvest index and number of seeds/ pod were accepted as major variables contributing to seed yield/plant variation with R^2 =68.9%. Factor analysis classified the eight studied traits into three main factors explaining 70.19% of the total variability in the dependent structure.

Factor 1 was responsible for 26.74% of the total variation in yield and included number of pods/plant and seeds weight /pod. Factor 2 included number of seed/pod and 100-seed weight and contributed by 26.46% of the total variation. Plant height, number of branches/plant and harvest index were the components of the third factor and accounted for 16.99% of the total variation. Path analysis indicated that the highest positive direct effects were scored by plant height, number of seeds/pod, 100-seed weight, harvest index and weight of seeds/pod with relative contribution to total yield variability of 12.13% ,11.78%,7.19%,6.82% and 4.82%, respectively. The greatest components of indirect effects for most traits of 16.45% were shown by number of seeds/pod via 100 seed weight. Consequently, it seems that selection for these lasttwo traits could be useful for improving faba bean productivity.

Keyword :*Faba bean, descriptive analysis, correlation coefficients, stepwise multiple linear regressions, factor analysisand path analysis.*