International Journal of Plant Sciences, **Vol. 3 No. 2 : 439-442 (July, 2008)**

Selection criteria and screening of elite germplasm lines of linseed

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(Accepted : April, 2008)

SUMMARY

A collection of 440 elite germplasm lines of linseed from P.C. Unit Linseed, (ICAR), C.S.A. University of Agriculture and Technology, Kanpur were evaluated for nine quantitative characters alongwith *Alterneria* blight incidence. Highest variability was noted for number of capsules per plant followed by number of secondary branches per plant, per cent disease intensity of *Alterneria* blight (PDI-AB) on leaves, number of primary branches per plant and number of seeds per capsule, which indicated wide variation in the material and considerable scope for improvement of these characters. Germplasm lines (123 and 170) were significantly earlier than the checks (Neelum, T 397 and Kiran) for days to 50% flowering and days to maturity, respectively, whereas germplasm lines 150, 139 and 14 were significantly superior for seed yield per plant, 1000-seed weight and PDI (AB) on leaves. Seed yield was negatively correlated with PDI (AB) on leaves. There was significant positive associations of seed yield with days to maturity, plant height, number of branches per plant, number of capsules per plant and number of seeds per capsule. The number of capsules per plant had high positive direct effect on seed yield per plant, whereas number of primary branches per plant and number of secondary branches per plant had high positive indirect effect on seed yield *via* number of capsules per plant.

Key words : *Linum usitatissimum,* Variability, Correlation, Path coefficient analysis, *Alternaria* blight.

Linseed grown in the country is next to rapeseed-mustard in area as well as in production. The oil content of the seed generally varies from 33-45 per cent. The average yield (401 kg/ha) is very low (Anonymous, 2003) due to marginal cultivation, utera cultivation, narrow genetic base and lack of disease and pest resistant varieties. To overcome these constraints it is important to develop varieties with improved characteristics. Estimates of genetic variability using suitable genetic parameters such as range, coefficient of variation, mean are prerequiste for screening of germplasm lines. To make effective selections for higher yield contributors and low incidence of *Alternaria* blight, interrelationship among themselves and with seed yield is necessary with more variables in correlation studies. Indirect associations become more complex and important. In such circumstances, the path coefficient analysis provides an effective mean to finding out direct and indirect causes of association. Thus correlation aided by path coefficients is a powerful tool to study characters association among linseed characters based on few, relatively similar lines grown over years. Present study on these aspects is based on 440 germplsam lines over two years of experimentation, which has given comparatively consistent results.

MATERIALS AND METHODS

Four hundred forty linseed genotypes collected from P.C. Unit Linseed, (ICAR), C.S.A.Univ. of Argri. and Tech., Kanpur constituted the material for present study. The experimental material was sown at Experimental Farm of N.D.University of Agriculture and Technology, Kumarganj, Faizabad during *rabi* 1998-1999 and 1999-2000 in Augmented design with three checks (Neelum, T 397 and Kiran) repeated after 40 lines of test entries. Each entries and checks were grown in single row of 5m length and spaced 30cm apart. Distance between plants in rows were maintained at 15 cm by thinning. The observations were recorded on ten randomly selected plants from each entry for plant height (cm), number of primary branches per plant, number of secondary branches per plant, number of capsules per plant, number of seeds per capsule, 1000-seed weight (g) and seed yield per plant (g), while days to 50 per cent flowering, days to maturity and per cent disease intensity of *Alternaria* blight (PDI-AB) on leaves were recorded on line basis. Disease incidence was recorded at peack infestation stage following 0-5 standard scale (0 = 0%, 1 = 1-10%, 2 = 11-25%, 3 = 26-50%, 4=51-75%, 5=76-100%). Per cent disease intensity was calculated by the following formula:

$$PDI = \frac{\text{sum of total numerical rating}}{\text{Total number of leaves observed x maximum grade}} \times 100$$

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