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Evaluation, Correlation and Path Coefficient Analysis among Seed Yield and Its Attributes of Oil Flax (*Linum usitatissimum* L.) Genotypes.

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Abstract: In field trials, six flax cultivars of diverse origins were grown during three successive seasons with three sowing dates in each growing season. Mean squares of all traits studied across the three seasons and three sowing dates; exhibited highly significant effects for all traits recorded. The effect of sowing dates was more pronounced than seasons for all traits except No. of fruiting branches / plant, seed index as well as seed yield/ plant, straw and biological yield/ plant which due to the differences of climatic factors prevail in the three sowing dates. The first and second order interaction involving genotypes and seasons or sowing dates were significant for all traits indicating different responses of genotypes under each of variation in environmental condition. In the third order interaction significance for all studied traits were shown for the interaction between genotypes x seasons x sowing dates. Seed yielding capacity for all tested genotypes ranged from 0.53 (g) for G3 in D3 of S3 to 1.95 (g) for G6 in D1 of S2. Results indicated that the magnitude of differences between flax genotypes tested is high for all traits under the experimental conditions. G5, G1 and G6 recorded the highest values (24.40, 26.45 and 22.48, respectively) for number of capsules/plant in the first, second and third season, respectively. The second sowing date was the best one through 1st and 2nd seasons as it recorded the highest values of seed yield / plant for different genotypes under study. Positive and significant associations were found between straw yield/ plant (g) and each of biological yield/ plant (g), seed yield/ plant (g), No. capsules/ plant, technical length (cm) and plant height (cm) and between biological yield/ plant (g) with each of No. capsules/ plant, length of the fruiting zone (cm), technical length (cm) and plant height (cm) and between seed yield/ plant (g) with length of the fruiting zone (cm) and plant height (cm) and between No. capsules/ plant with technical length (cm) and plant height (cm) and finally between both plant height (cm) and technical length (cm). Insignificant negative correlation coefficients were detected between ten pairs out of all combinations of traits studied. The components of seed yield variations determined directly and jointly by each factor are calculated. The main source of plant seed yield variation in order of relative importance was the direct effect of number of capsules / plant (33.15 %) and its negative joint effect with seed index (16.35 %) followed by its joint effect with number of fruiting branches / plant (12.65 %) and its joint effect with length of fruiting zone (3.07 %). Hence, number of capsules/ plant totally contributes seed yield / plant by 49.2 % out of 98.27 % total contribution of the four traits fractionated in this study. Meanwhile the residual effect assumed to be 1.73 % of the total phenotypic variations.

Kew words: Flax (*Linum usitatissimum* L), Evaluation, Path Coefficient, Seed Yield , oil.

INTRODUCTION

Flax (*Linum usitatissimum* L.) belongs to Linaceae family that consists of 9 genera and 150 species. It is the only species in this family that has economic as agronomic values. It is annual and rarely perennial crop and has 2 different forms that are used for fiber and oil production (Kurt, 1996). Flax seeds contain 30-45% oil, making it an important industrial crop. Since flax oil is dried off rapidly, it is quite valuable in dye industry (Copur *et al.,* 2006). Flax is the third largest natural fiber crop and one of the five major oil crops in the world. It is a small size and self pollination herb that has been thought to be the model plant for the bast fiber plants. At present, fiber flax cultivars are mainly grown in some regions of northern Europe, Russia and China, while distinct linseed flax varieties are widely grown in cool temperate regions of Argentina, India, China, Russia, the USA and Canada (Millam *et al*., 2005 and Deng *et al*., 2011). Fiber flax is bred for its long fiber; whereas, line seed was deliberately bred for short and highly branched plants with increased number of flowers for enhanced seed production. Linseed oil originated from the seeds has many industrial applications, e.g. paints, linoleum carpet and ink. In the western region of Eurasia, flax is mainly grown for its fiber, whereas in the eastern region of Eurasia flax is grown for its oil (Gill and Yermanos, 1987). Divergent selection for fiber flax and linseed in connection with the early dispersion of this crop resulted in a wide range of infraspecific variation.

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