



Evaluation of 'KL241': a new genotype of linseed (*Linum usitatissimum* L.) under *utera* cultivation

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Received: 01 November 2015; Accepted: 20 November 2015

Abstract

A field experiment was conducted during *rabi* 2014-15 at Palampur to evaluate a new genotype of linseed *viz.* 'KL-241' in comparison to 'Baner' and 'T-397'. The new entry 'KL-241' was significantly superior to national check 'T-397' in term of almost all growth and yield attributes *viz.* plant stand, number of capsules/plant and 1000-seed weight. However, number of primary and secondary branches and seeds/capsule were not significantly influenced due to genotypes. 'Baner' (Zonal Check) was at par with 'KL-241' for plant stand, number of capsules/plant and seed yield of linseed. 'KL-241' registered 137.9 and 10.2% higher seed yield over 'T-397' and 'Baner', respectively. Maximum net returns and B:C ratio of INR 10383/ha and 1.18, respectively, were obtained under 'KL-241', which was followed by zonal check-'Baner'.

Key words: Linseed, *Utera*, Varieties, Yield, Economics

Linseed (*Linum usitatissimum* (L.) Griesb.) is becoming increasingly popular as a nutritional and functional food. Seed is a rich source of both non-edible and edible oil. The oil crushed from the seeds can be used for either industrial or edible purpose, depending on the fatty acid composition (Burton 2007). Edible linseed oil is used for human consumption and contains high α -linolenic acid (ω 3 fatty acid), a polyunsaturated fatty acid along with high content of health promoting substances such as soluble and insoluble fibre and lignans (Genser and Morris 2003 ; Morris 2005). In Himachal Pradesh, released linseed cultivars have low linoleic and high linolenic acid composition which make them suitable for cooking purpose. In the state, linseed is generally broadcasted in standing paddy crop, 15 -20 days before its harvest. This relay system of cultivation is popularly known as '*utera*' or '*paira*'. The cultivation of linseed in this system is under total "Nature's care and cure" which results in lower productivity. The use of local land races susceptible to rust, other diseases and easily smothered by the weeds further limits linseed production in

this system. The past efforts were limited to verification of genotypes and agrotechniques under prepared seed bed conditions and not for *utera* cultivation. Genotypes differ from each others in genetic make up for growth and yield and behave differently in different environments. Under *utera* system, varieties having small seed size and deep root system will be of much importance (Agarwal *et al.* 1986). A new entry *i.e.* 'KL-241', (Giza-7 and KLS-1) having similar characters and performance needs to be confirmed under this system of cultivation.

Keeping this in view, the present study was conducted at Main Farm of Department of Crop Improvement, CSKHPKV, Palampur during *rabi* 2014-15 to evaluate the performance of new entry ('KL-241') in comparison to two checks *viz.* 'T-397' (NC) and 'Baner' (ZC) in randomized block design with seven replications under *Utera* system of cultivation. The soil of the experiment site was silty clay loam in texture with pH 5.9 and medium in available nitrogen, phosphorus and potassium. The crop was supplied with 60 kg N/ha. The crop was sown by broadcasting seeds of

linseed at dough stage of paddy using seed rate of 75 kg/ha. The total number of plants present in 0.25 m² area were counted in a quadrat of 0.5 m x 0.5 m at random in each plot and expressed in number of thousand plants/ha. Plant height, number of primary and secondary branches and capsules/plant were recorded from the selected five plants in each net plot. The crop was harvested from net plot. It was sun dried and threshed with wooden mallet. The seed yield was expressed in kg/ha. Economics was calculated on the basis of prevalent market prices of inputs and outputs.

Among different genotypes, Zonal Check-'*Baner*' resulted in significantly more plant height followed by test entry '*KL-241*'. Test entry '*KL-241*' was statistically similar to zonal check-'*Baner*' for plant stand and number of capsules per plant. However, the test entry was significantly superior for 1000-seed weight. Different genotypes failed to influence the number of primary and secondary branches/plant and number of seeds/capsule. Owing to higher plant population and yield attributes, '*KL-241*' and '*Baner*' resulted in significantly higher seed, straw and biological yield. Although, both the entries behaved statistically similar to each other but yield advantage of about 10.24% was recorded under test entry '*KL-241*' over zonal check-'*Baner*'. There was an increase of 137.9 and 115.8% in the seed yield with '*KL-241*' and '*Baner*' over '*T-397*'. This might be due to better root development by these genotypes which helped in better absorption of nutrient and water in this system. Based on the best performance of '*Baner*' in *utera* system, this variety was released for Zone-I of India (Anonymous 2006). Similarly, '*KL-241*' was found to be highest yielding in both breeding and agronomic evaluation trials under similar conditions (Anonymous 2014 & 2015). The National Check '*T-397*' was found to be significantly inferior in all these aspects (Table 1).

Maximum gross, net return and B:C ratio of INR 19218, 10383/ha and 1.18, respectively were obtained under test entry '*KL-241*', which was followed by Zonal check-'*Baner*'. '*KL-241*' registered an increase of INR 1786/ha in net return over the best check *i.e.* '*Baner*'. Higher production and almost similar cost of cultivation for raising '*KL-241*' as compared to '*Baner*' resulted in better returns. National Check, '*T-397*' was not at all acceptable from production and economic point of view (Table 1).

Table 1. Effect of genotypes on plant stand, plant height, yield attributes, yield and economics of linseed

Genotype	Plant stand (000'/ha)	Plant height (cm)	Primary branches/plant	Secondary branches/plant	Capsules/plant	Seeds/capsule	1000-seed wt. (g)	Seed yield (kg/ha)	Gross return (INR/ha)	Net return (INR/ha)	B:C ratio
' <i>KL-241</i> '	2193.86	43.82	4.65	3.00	19.20	6.89	6.03	640.59	19218	10383	1.18
' <i>T-397</i> ' (NC)	1083.57	35.05	3.97	2.80	15.80	6.26	4.54	269.28	8078	-172	-0.02
' <i>Baner</i> ' (ZC)	1955.86	49.59	4.26	2.91	17.80	6.77	5.87	581.07	17432	8597	0.97
CD (P=0.05)	275.42	3.81	NS	NS	1.90	NS	0.11	60.77	-	-	-

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