INTRODUCTION

Oilseed crops are the most important commercial crops of our country, from which we get oils and fats. India is one of the leading oilseeds producing countries in the world and occupies 14 per cent of world’s area and 8 per cent of world’s production (Hedge 1999). The oilseed production occupies an important place in agricultural plans of the country. India ranks first in caster, safflower and sesame in world’s production and is second in groundnut and third, fifth and sixth in linseed, rapeseed-mustard, soybean and sunflower respectively (Damodaran and Hedge 1999). Linseed growing countries are USA, Canada, Russia, Argentina, Uruguay and India. The leading linseed fiber growing countries are Russia, Poland, Belgium, France and the Netherlands. In India it is grown mainly in the central parts of the country chiefly Madhya Pradesh, Eastern Maharashtra, Bihar, Uttar Pradesh, Andhra Pradesh, Rajasthan, Orissa, Karnataka and West Bengal. Uttar Pradesh and Madhya Pradesh alone produce about 70 per cent of the total linseed production in the country.

Linseed is basically an industrial oil crop and each and every part of it has got commercial importance. Nearly 80 per cent of linseed oil goes to industries where it is used for the manufacture of paints, varnish, oil cloth, linolin, pad ink, printing ink, soaps, patent leather,
lamination rubber and many other products. Linseed oil is also used for cooking purposes in different parts of the country. On a very small scale the seed is directly used for edible purposes. The oil cake is good in taste and used as feed to milch cattle, horses and other live stocks.

The linseed oil is used in processing of cementing roads in USA (Walsh 1965) and antibiotic (Anonymous 1968). Linseed oil is rich in omega 3 fatty acids which prevent coronary heart disease.

The fiber obtained from the linseed stem is used for the manufacture of linen goods. The fibers have length, strength, durability and beauty. It blends very well with wool, silk, cotton and synthetic fibers. Strong farness, canvas, suiting, shirting and various indispensable products for defense purposes are manufactured from the linseed fibers. The stem is also used for making papers and plastics.

In India the production and productivity of linseed is far below (300-350 kg/ha.) the average yield obtained by other countries such as Argentina (788 kg/ha.), Canada (900 Kg/ha.) and China (1327 Kg/ha.) while, the vegetable oil consumption in the country is continuously rising and has sharply increased in the few couple of years touching about 12.4 Kg/head/year. This is still below the world average consumption of 17.8 kg/head/year.

To meet the demand of vegetable oils the production and productivity necessarily be increased. In general there is hardly any scope for bringing additional area under oilseeds. The production and
productivity of linseed is restricted due to its narrow genetic base, mixed cropping, cultivation mostly in un-irrigated semi-arid areas, unawareness of package of practices, lack of balanced fertilizers and preference of other crops over linseed. Use of improved varieties, integrated nutrient supply and effective crop management will somehow be helpful in this regard. To broaden the genetic base and improving the linseed varieties/genotypes/germplasms the knowledge of different selection and genetic parameters such as variability, heritability, genetic advance, character association, path analysis and stability analysis is very essential.

Germplasm serves as the most important natural resources which provides required attributes for developing suitable varieties. Unless properly evaluated the germplasms of any crop remains useless or of little value. The success in selection to develop improved strains by exploiting the genetic variability depends upon the amount of transmissibility of trait under consideration. The genotypic, phenotypic and environmental coefficients of variation are helpful in exposing the clear picture of existing variability in population under study, while the heritability and genetic advance provide the index of transmissibility of character. Hence the computation of direct selection parameters such as co-efficient of variation, heritability and genetic advance will be very useful to prepare a suitable breeding programme for improvement of the crop.

As we know that the yield is a complex character and it is
difficult to understand the different factors for high yield (Grafius 1959). Hence, handling the yield components a plant breeder is required to overcome on such complex situations. Since heritability is an index of transmissibility of a character together with genetic advance, it indicates whether the traits are governed by additive or non additive genes. Path coefficient analysis partitions the correlation into direct and indirect effects (Dewey and Lu, 1959).

For selection and stability the genotype (G) and environment (E) interaction and adaptation studies have important place because the expression of gene depends upon environmental conditions. Eberhart and Russell (1966) have proposed a model which enables the study of stability under different environments. Wright (1921) gave the concept of path coefficient concept as an attempt to analyze stability. Dewey and Lu (1959) applied this technique for plant breeding. The stability analysis in linseed have been done by few workers only (Rai et al. 1989, Popescu 1991, Yadav and Gupta 1999).

However the works regarding above aspects in linseed is still very scanty specially for Eastern Uttar Pradesh. Hence, keeping in view the present research work entitled “Stability and biometrical analysis of yield and its components in linseed (Linum usitatissimum L.)” is proposed with the following objectives:
OBJECTIVES:

(i) To study the variability, heritability and genetic advance for different characters.

(ii) To workout the correlation among yield and other yield contributing traits and path coefficient analysis.

(iii) To analyze the stability parameters over environment.

(iv) To find out the performance of different varieties/genotypes of linseed under different environments.

(v) To identify high yielding varieties/genotypes suitable for different environments.

(vi) To identify the most stable high yielding varieties/genotypes of linseed.