INTRODUCTION
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*Linum usitatissimum* L. has centuries old history and has been recognized, since long, as a source of linen and linseed oil. The first cultivated form was a biennial type, with small, narrow leaves, *Linum augustifolium* Huds.; but the annual or common flax, *L. usitatissimum* has been grown in Mesopotamia for at least 4000 years (Hayward 1967). The common flax belongs to the family Linaceae having 12 genera and 290 species of wide geographical distribution (Willis, 1966). The family is identified by pentamerous flowers, with contorted corolla composed of distinct and usually clawed fugacious petals and by shortly connate filaments and septicidally dehiscent capsules.

*L. usitatissimum* is the only species of commercial importance. In addition, a few, others are grown for decorative purposes. Two distinct types of flax have been developed; fibre-flax which produce fibre for linen, and seed-flax, producing oilseeds for linseed oil. The seed crop does well under moderate cold climate but the fibre crop in the cool moist one (Anonymous, 1962).

Most of the total crop production comes from Russia, but the fibre of the finest quality is grown in Belgium and Holland.
In Argentina, India and the United States, the crop is grown chiefly for linseed oil, rather than for the fibre (Hayward, 1967).

The crop is cultivated throughout the plains of India up to an altitude of 1,800 m. The seeds are sown in October and November and the crop matures by the end of March and April, depending upon the time of sowing and variety grown. Three species are recorded in India of which *L. usitatissimum* L. is cultivated widely for its oil-seed. *L. biennae* Mill. syn. *L. augustifolium* Huds. and *L. grandiflorum* Desf. are grown as ornamentals. The diploid chromosome number of Indian types is 30 (Anonymous, 1962).

India accounts for an area of about 4.3 million acres and ranks fifth among linseed producing countries of the world in its total production of 3.9 lakh tonnes. Among the various states of India, Madhya Pradesh leads in acreage followed by Uttar Pradesh and Maharashtra.

Flax grown for fibre are generally slender, tall, non-tillering and sparingly branched, and those for seed are usually dwarf, much branched and profusely tillering.

The oil content of the seed varies from 33% to 47% in different varieties. Linseed oil having excellent drying characteristic is extensively used in the preparation of paints,
varnishes printing inks, oil-cloth and water proof fabrics, and as edible oil in some area. The residual cake is valuable as cattle feed as well as manure. The stalks are used for fuel, but sometimes coarse fibre is also extracted from them (Anonymous, 1962).

The effect of ionizing radiations has found its use not only in understanding the various fundamental problems of life processes but also in improving the crop strategy through mutation for resistance to various pests and moulds, as well as for better yield. Gamma-irradiation has already taken its own place in crop improvement and in the analysis of growth events as an effective tool.

The irradiation work on cultivated plants is largely confined to certain cereals such as wheat, rice, barley, oats and a few oil crops like mustard, castor and pulses like pea and gram. A review of literature indicates that the linseed crops has not yet been studied to the extent it deserves, as an important cash crop especially as far as the Indian varieties of flax are concerned.

The earliest work on Linum in relation to radiation is that of Johnson (1936c). Later Gustafsson (1944) and Levan (1944) have reported irradiation effects on flax, treated with acute doses. After 12 years, Sparrow and Gunckel (1956) reported severe radiation damage. In 1957, D'Amato noticed a very high,
incidence of fasciation in plants exposed to chronic gamma-irradiation. In the early seventies attempts have been made for a detailed study on the effects of gamma-irradiation in the form of chronic and acute doses on morphological characters as well as in the yield characteristics of linseed crop (Bari, 1971).

Although much information is available on responses of linseed crop to various acute and chronic doses of ionizing radiations, our understanding regarding their responses with respect to developmental, floral and anatomical aspects is extremely meager, particularly of the Indian varieties.

The present work, therefore, has been under-taken to fill up the existing gaps in our knowledge regarding the effect of irradiation on linseed crop, with special reference to growth responses which include germination and survival, general growth pattern, productivity and floral characteristics in relation to different acute doses of gamma rays in three consecutive generations.