

# EFFECT OF ACUTE GAMMA IRRADIATION ON SEED GERMINATION IN *LINUM USITATISSIMUM* L. VAR. *NEELUM*\*

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## ABSTRACT

The present report deals with the effect of acute doses of gamma-rays from a  $\text{Co}^{60}$  source in *Linum usitatissimum* L. var. *neelum*.

It is found that gamma radiation effectively promotes the germination process to the extent of about 20% over the control when it is applied to the seeds in dry condition at an intensity of 75 k rad. Lower dosages like 25 or 50 k rad do not appear to promote the process to any extent, while higher dosages like 100, 125 or 150 k rad bring about a gradual decline in germination process in positive manner. However, the percentage of germination scored in the above higher dosages did not in any way show distinct lowering of the germination percentage over the control.

The present finding is contrary to the findings of BARI (1971) who obtained no clear difference in the germination of *Linum* seeds treated with acute doses of gamma-rays.

## INTRODUCTION

The dying decade of the last century laid the foundation of a new branch of Science which is popularly known as Radiobiology. The literature in this branch of Science has grown at an exorbitant rate in the last few decades. Seed germination under the influence of ionizing radiations has been worked out in some detail by several workers (JOHNSON, 1928 ; BARI, 1971 ; CHOPRA, 1972 ; RAVINDRANATH, 1974 ; RAGHUVANSHI & SINGH, 1977). The present work is an attempt to find out the effect of gamma-irradiation in acute doses on seed germination in *Linum usitatissimum* L. var. *neelum*.

## MATERIAL AND METHOD

Certified and healthy seeds of *Linum usitatissimum* L. var. *neelum* were procured from the Economic Botanist, Oil Seeds, Kanpur. The seeds were adjusted at 10 per cent moisture level before exposing them to six acute doses (25, 50, 75, 100, 125, 150 k rad) of gamma-rays in the gamma-chamber having  $\text{Co}^{60}$  as a source in the Radiation Biology Laboratory of the National Botanical Research Institute, Lucknow. For each treatment 400 seeds were taken. Sowing was done on the second day after treatment in four replications in pots containing garden soil and precaution was taken to plant the seeds at uniform depth. The untreated 400 seeds sown as in above cases served as control.

The emergence of cotyledons above the soil level was taken as a criterion for germination and observations were recorded daily till 30th day after sowing.

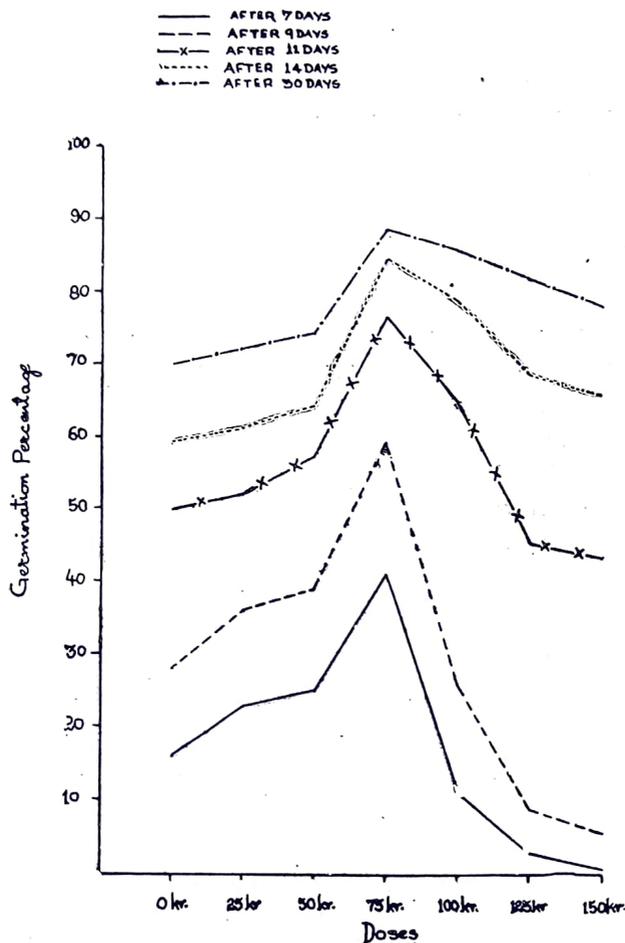
## OBSERVATIONS AND DISCUSSION

The germination was first recorded in control as well as in all the treatments after 7 days of sowing. The germination percentage observed at the initial stage of the experiment, i.e., on the 7th day, indicates that number of germinated seeds increased with increasing dosages of gamma-rays till the ionizing intensity reached the optimum level of

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\*Paper presented at the Second Indian Geophytological Conference, Lucknow, March 11-12, 1978.

75 k rad. The dosages higher to this showed declined germination percentage which was minimum for 150 k rad (Fig. 1). However, after a week's duration, the rate of germination under higher doses showed recovery to a considerable extent but remained less than the optimum.



( FIG. 1 )

Based on the above observations it is concluded that the present findings go contrary to the findings of BARI (1971), who obtained no clear difference in the germination of *Linum* seeds treated with acute doses of gamma-rays. It is very likely that varietal difference may be one of the major causes to show this difference in our observations from that of BARI.

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