

Effect of Neutron Irradiation on Robinia pseudoacacia Seeds.

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Several reports regarding the radiation effects on the tree species have appeared(1, 2, 3, 4, and 5). Black locust (*Robinia pseudoacacia*) has been made growing in Korea for the purposes of erosion control and fuel-wood production. As a basic study for inducing some mutants of black locust, the neutron irradiation effects on black locust seed germination have been investigated.

Materials and Method

The seeds of black locust were yielded at Suwon, Korea, in the autumn of 1960. These seeds were air-mailed to the Institute of Genetics, Forest Research Institute of Sweden, Stockholm 51, where an investigation has been conducted. Neutron irradiation was applied at the atomic reactor, RI, in Stockholm under the kind cooperation rendered by

1120, 1680, 2240 and 4200 rads. Seeds were irradiated on February 9, 1961 and were sown in petri-dishes 59 days after irradiation. The petri-dishes contain two sheets of water retaining filter paper, under which 4 mm thick river sand has been laid. These placed in the laboratory room where air temperature was standing at $22^{\circ} \pm 1$. A total of 800 seeds has been treated. The experimental design was a randomized block arrangement with two replications

Results and Conclusion

The X-ray photography of the seeds has shown that the seeds had proven to be almost complete in quality, except to some of those shrivelled or small sized carefully removed for the uniformity of the seeds(Fig. 1.) The effect of neutron irradiation on percent germination was presented in Table 1.

Table 1. Mean cumulative germination percent of neutron irradiated black locust seeds.

neutron dose (rad)	Time since seed sown (days)												
	2	3	4	5	6	7	8	9	10	11	12	13	
Cont.	0	0	2	2	10	22	22	32	36	38	42	44	
280	2	2	4	4	4	8	12	22	22	23	26	26	
560	0	2	4	4	8	14	16	24	28	34	34	35	
840	0	0	0	2	4	8	14	16	18	22	23	26	
1120	2	2	2	2	8	14	18	24	28	34	34	34	
1680	0	2	2	2	4	6	16	20	20	26	32	34	
2240	0	2	2	6	8	12	12	14	16	18	24	26	
4200	0	0	0	2	4	6	6	14	14	16	20	20	

Drs. L. Ehrenberg and G. Ahnström. The neutron doses were given as follows; 0, 280, 560, 840,

As shown in the Table 1, within the range of neutron doses applied aforesaid, there resulted little variations of germination percent. However, it can be stated that neutron irradiation suppresses the

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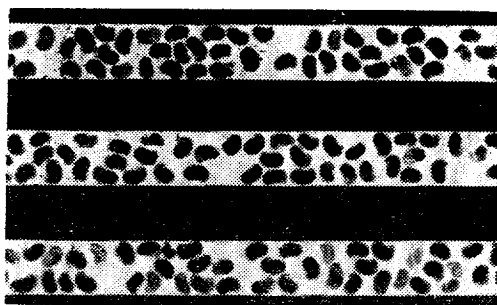


Fig. 1. X-ray photographed black locust seeds

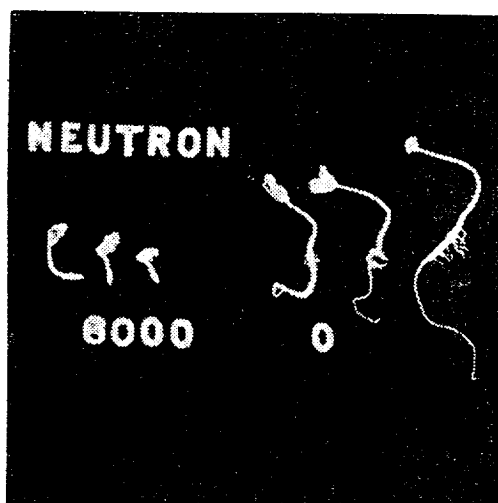


Fig. 2. Suppressed growth of black locust seedlings caused by neutron irradiation. 6000 indicates 4200 rads treatment.

germination percent, particularly when neutron doses exceed 4200 rads. At the high doses, the development of root system as well as the hypocotyl length was seriously oppressed as shown in Fig. 2. The neutron dose that causes the 50 percent suppression of hypocotyl length or root length was lower than the LD_{50} based on the germination percent.

Literatures

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速中性子照射가 Robinia pseudoacacia 종자에 미치는 影響

任 慶 彬 *

氣乾狀態에 있는 水原地方產의 *Robinia pseudoacacia*의 種子가 速中性子照射處理를 받았을 때 약 2000 Rads의 照射量으로서는 照射後 2週日이 된 때의 發芽率에 큰 影響을 주지 않았으나 4200 Rads

로서는 發芽率의 顯저한 低下가 보였다. 發芽率에 立脚한 LD_{50} 은 根系 또는 幼莖長에 立脚한 LD_{50} 보다 높았다. X-ray photography로 種子形質이 事前에 調査되었었다.