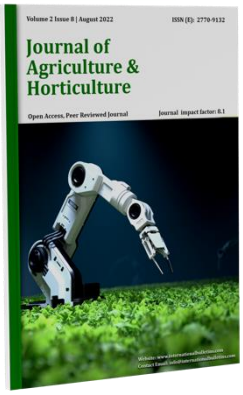

FIELD GERMINATION OF INDIGOFERA SEEDS.

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In recent years, various problems have arisen due to the use of land for agricultural purposes, the land reclamation condition has deteriorated, and its productivity is decreasing year by year. Today, the expansion of the area of degraded soils is causing a decrease not only in soil fertility but also in the productivity of agricultural crops. Maintaining and increasing soil fertility remains an urgent issue today.

It is possible to increase soil fertility and crop productivity by introducing new non-traditional crops into crop diversification, and indigofera can be included among such crops.

The plant was once widespread in Southeast Asia and other parts of Japan, but is now found only in a few areas. It is still cultivated in northeastern and southern India [4] and parts of West Africa, but has almost disappeared from the Middle East, North Africa, and Central America, where it was once known for its cultivation. [2] This is due to changes in agricultural systems, land use, and drought.

A unique dye was obtained from the perennial indigofera (Indigofera tinctoria L.), which grows wild in the most fertile lands of the Indonesian archipelago or in Nigeria. However, in order to produce a high-quality commercial dye, sensitivity was required at every stage of indigo cultivation [3]. To maintain the quality of the dye, new quality seeds from other countries were needed. Therefore, good lands were allocated for seed production [6].

Legumes fix biological nitrogen with the help of bacteria in their roots. Indigofera also helps to increase soil fertility by accumulating bacteria in its roots. Also, when a stimulant was applied to indigofera, 2.92-5.11 t/ha of root and 1.72-2.37 t/ha of grain residues were accumulated [1].

When studying the effect of Indigofera plants on soil salinity in improving the productivity of degraded, saline soils unsuitable for agriculture in the soil-climatic conditions of the Khorezm region, it was observed that the dynamics of the decrease in salts in the soil composition decreased by chlorine ion -0.037%; SO4 - 0.0028%, dry residue by 0.01% and Ph by 0.07 [5]. Considering that Indigofera comprehensively meets the needs of our people and has not been fully studied scientifically, it is urgent to develop and improve agrotechnologies for its cultivation and introduce the results into production.

The seed is the generative organ of the plant, which determines the productivity of crops and the quality of the product. Seed germination and various factors affecting it are different in different plants. Different plants require different soil temperatures, air temperatures, and water for germination. It should be noted that since the Indigofera plant is a tropical plant, its seeds germinate at high soil temperatures, and the optimal temperature is 18-20 °C. The soil temperature reaches this level in the Jizzakh region in the second half of April.

In the experimental field, indigofera seeds were sown according to the experimental

system in the last ten days of April (22.04) at three different rates: 1.3 kg, 2.0 kg, and 4.0 kg per hectare. The seeds were sown with a row spacing of 76 cm, and their germination rate was measured every three days. It was observed that the germination rate of the studied plant increased steadily every three days. According to the research results, the studied plant fully germinated on 05.05.

In the variant with 1.3 kg/ha, the seed germination rate was 76.6%; for 2.0 kg/ha, it was 79.2%; and for 4.0 kg/ha, it was 74.6%. The highest germination rate of 79.2% was observed in the variant with a seeding rate of 2.0 kg/ha. It was noted that reducing the seeding rate led to a decrease in germination by up to 2.7%, while increasing the seeding rate caused a reduction of up to 5.2%.

Table 1

Effect of different sowing rates on seed germination, %

№ Option	Sowing rate, kg/ha	Average germination, %				Average germination, units\ha			
		28.04	30.04	02.05	05.05	28.04	30.04	02.05	05.05
1	1,3	17,4	34,9	60,3	76,6	19140	38390	66330	84260
2	2,0	11,8	36,3	65,9	79,2	19470	59895	108735	130680
3	4,0	10,8	35,9	64,6	74,6	35640	118470	213180	246180

When the seeding rate was increased from 0.7 kg per hectare, the germination rate increased to 2.7%, because when the seeds were planted more densely, there was competition between them, and the germination rate also increased. Increasing the seeding rate to 2.0 kg/ha led to a decrease in germination. This is explained by the reduction of the nutrient area for seed germination.

Conclusion. In the conditions of the pasture gray soils of the Jizzakh region, when indigofera seeds were planted in the third decade of April at a rate of 2.0 kg per hectare, the germination rate of the seeds was high, and increasing or decreasing the seeding rate led to a decrease in germination. Therefore, planting indigofera seeds at a rate of 2.0 kg per hectare is considered an acceptable rate for uniform germination..

References:

1.Negmatova S.T., Ortiqova L.S., Abdunazarova G.A. The importance of stimulators in cultivating non-traditional crops – Indigofera. Bulletin of the Khorezm Mamun Academy: Scientific Journal. - №10/1 (106), 2023. pp. 149–155.

2.Bray, Francerca. “Agriculture” in Science and Civilisation in China (ed. Needham, Joseph), Cambridge, 1984, Vol. 6, Part 11: pp. 277, 279, 589–593.

3.Jenny Balfour-Paul. Indigo: Egyptian Mummies to Blue Jeans. Routledge, 1996. p. 95.

4.Jenny Balfour-Paul. Indigo Plants and Making of Their Dye. Sublime Indigo, 1987. p. 43.

5.Negmatova, S.T., Yakubov G.K., Akhmedov Sh.E. Efficiency of cultivating indigo (Indigofera tinctoria). Proceedings of the International Scientific and Practical Symposium on "Achievements, Innovations, Technologies, and Development Prospects in Agricultural Science and the Textile Industry". August 17–18, 2022. pp. 241–242.

6.Taylor H.M., Gardner H.R. Penetration of cotton taproots as influenced by soil density, biostructure, and strength. Soil Science. 1963. Vol. 96. pp. 153–156.