



PLANTING RATES AND THE EFFECT OF BIOPREPARATIONS ON THE GROWTH DYNAMICS OF CROTALARIA

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<https://doi.org/10.5281/zenodo.17172870>

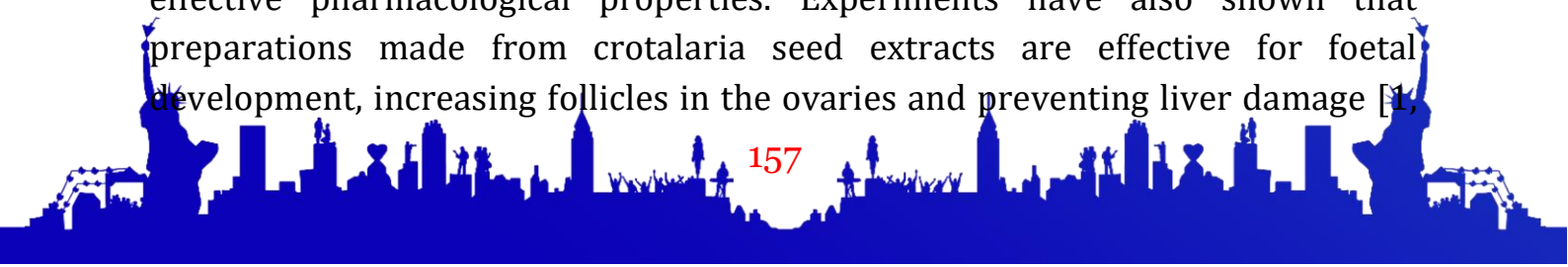
In recent years, the Central Asian region has faced numerous challenges in the area of food security. In particular, given the shortage of irrigation water, declining soil fertility and falling crop yields, there is a need to provide the population with high-protein products. In order to diversify agricultural crops, it is important to introduce new types of plants that are resistant to salinisation and drought.

To address these challenges, it is necessary to diversify crops by introducing non-traditional crops such as crotalaria, indigofera, phacelia, quinoa and others that are resistant to adverse conditions, to develop and implement agricultural technologies for acclimatising new varieties of these crops, and to cultivate them. In recent years, non-traditional crops with high yields have been imported from abroad to our republic's fields. Among them is *Crotalaria juncea* L., which in the future may be of great importance to our country's economy, including for improving soil reclamation, increasing soil productivity, strengthening the feed base for livestock, and as a food and pharmaceutical raw material.

The *Crotalaria juncea* plant is biologically adapted to various soil and climatic conditions. Its seeds are used for food, hay is used as high-calorie feed in animal husbandry, in agriculture to increase soil fertility and improve its reclamation condition, in medicine to treat various diseases, in beekeeping as nectar, and as a source of fibre for light industry [2, 5].

Crotalaria is a tropical legume that can produce large amounts of biomass in a short period of time. When used as green manure, it accumulates 60 kg/ha of N (nitrogen) in the soil [3]. It also accumulates 1125-1350 kg of biomass and 27-32 kg of nitrogen per hectare within 60-90 days after planting.

Crotalaria has also been studied as a medicinal plant due to its safe and effective pharmacological properties. Experiments have also shown that preparations made from crotalaria seed extracts are effective for foetal development, increasing follicles in the ovaries and preventing liver damage [1,





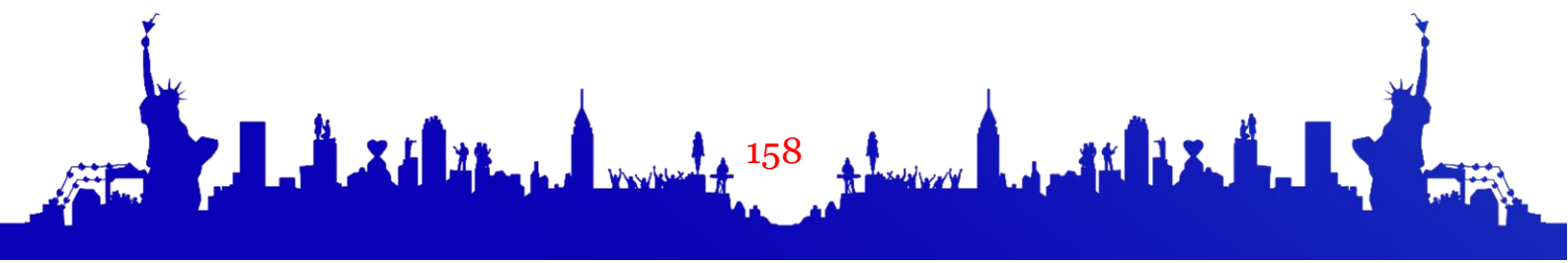
4]. Crotalaria seeds are also used as porridge and coffee. Therefore, A. Prakash [6] and others conducted experiments to study the effect of ethanol extract of its seeds on the body.

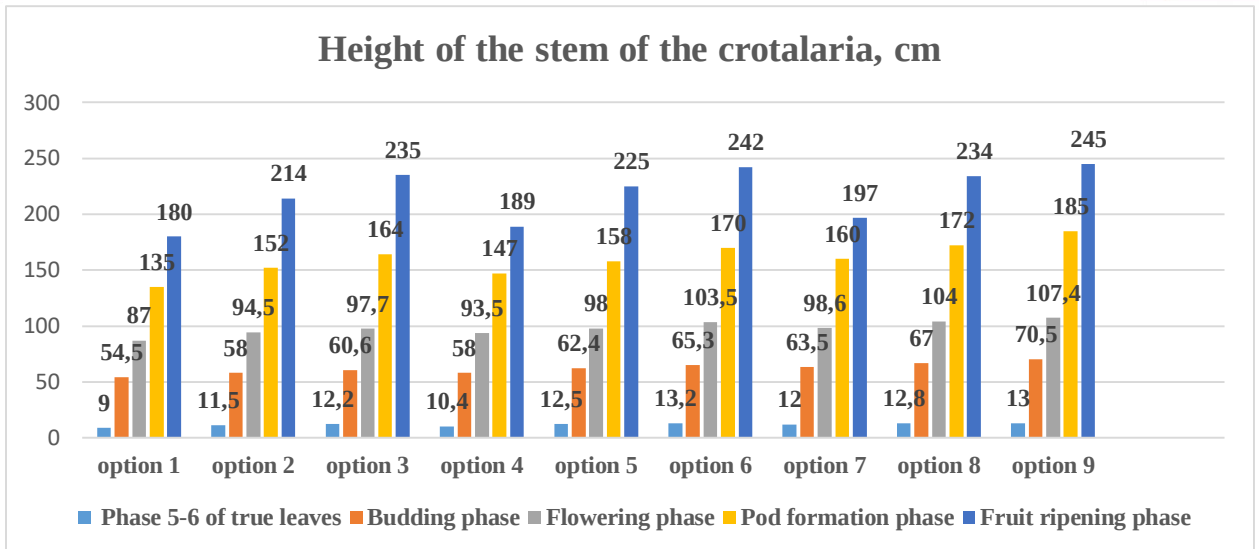
Given that crotalaria fully meets the needs of our people and has not been fully studied scientifically, it is important to develop and improve agricultural technologies for its cultivation and to implement the results in production.

Plants of the Crotalaria genus are perennial or annual grasses, semi-shrubs and shrubs that can reach heights of 30 cm to 10 m, with the species Crotalaria juncea reaching heights of 1.5 to 4.0 m. The height of the plant stem is influenced by a number of factors, such as soil, climate, fertilisers, water, and certain agrotechnical measures, namely the timing and rate of sowing seeds and the use of various biological preparations. The height of the Crotalaria stem was determined at all stages of plant development (development of 5-6 true leaves, budding, flowering, pod formation, and fruit ripening).

When planted on 20 April 2024 in the soil and climatic conditions of the Navoi region, the seeds of Crotalaria germinated completely in 12-14 days, and 5-6 leaves formed in 22-24 days. In the 5-6 leaf phase, the height of the plants was 9.0-13.0 cm. The planting rate was increased, and it was found that in the variants treated with biological products, it was 1.5-2.2 cm higher than in the control variants.

Crotalaria enters the full budding phase 48-50 days after planting, in the first half of June. By this time, the plants are 54.5-70.5 cm tall, and increase in height as the sowing rate increases. For example, with a sowing rate of 8.0 kg/ha, the height of the plants is 54.5-60.6 cm, with an increase in the sowing rate to 4 kg/ha – 58.0-65.3 cm, and with an increase in the sowing rate to 8 kg/ha – 63.5-70.5 cm. That is, when the sowing rate is increased to 8 kg/ha, the height of the plants increases to 9.9-12.5 cm.





1 – Figure. The effect of planting density and the use of biological products on the height of the stem of the crotalaria.

The influence of biological products on the height of the stem of *Crotalaria* depending on the planting rate was traced. At all planting rates, the stem height in the variants with the use of biological products was 3.5–6.0 cm higher than in the control. At the same time, the stem height in the variant with the use of the biological product “Microustirgich” was 2.0–3.5 cm higher than in the variant with the use of the biological product “Microzym-1”.

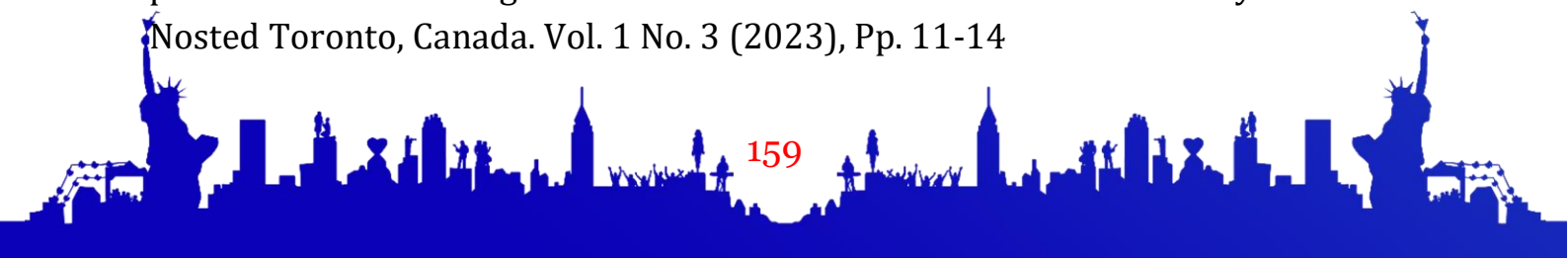
The height of the stems of the *crotalaria* plants during the flowering phase was 87.0–107.4 cm, during the podding phase – 135.0–185.0 cm, and during the ripening phase – 180.0–245.0 cm. During these phases, increasing the sowing rate and using biological products also led to an increase in stem height (Figure 1).

These patterns were repeated in the data on plant stem height in 2023 and 2025.

Conclusion. When growing *crotalaria* as the main grain crop in the light meadow grey soils of the Navoi region, in order to obtain tall plants, it is recommended to treat *crotalaria* seeds with the biological product ‘Microustirgich’ before sowing and to sow 16 kg of viable seeds per hectare.

List of references:

1. Ali Yesmail Al-Snafi. The contents and pharmacology of *Crotalaria juncea*- A review. IOSR Journal of Pharmacy www.iosrphr.org (e)-ISSN: 2250-3013, (p)-ISSN: 2319-4219 Volume 6, Issue 6 Version. 2 June 2016. Pr. 77-86.
2. Babayeva Z.A., Negmatova S.T. Importance of non-traditional leguminous plant *crotalaria* in agriculture. Innovative research in modern yeduction. Nosted Toronto, Canada. Vol. 1 No. 3 (2023), Pp. 11-14





3. Clark A. Sunn hemp: *Crotalaria juncea*. In: Managing cover crops profitably. 3rd yed. Sustainable Agriculture Research and Yeducation, College Park, MD. 2007.
4. Malashetty V.B and Patil S.B. Yeffect of chromatographic fractions of yethanolic yextract of *Crotalaria Juncea* (L.) seeds on ovarian follicular kinetics and yestrous cycle in albino rats. IJPT 2007, 6(2): RR. 159- 163.
5. Negmatova S.T., Nurillaeva M.Sh., Yakubov G.K. The Yeffect of Sowing Time and Rate on Crude Protein Content in *Crotalaria Juncea* Grain. Jundishapur Journal of Microbiology.Vol.15, No.1 (2022) Iran, P.8353-8359. Scopus
6. Prakash A.O, Dehadral S and Jonathan S. Toxicological studies on the yethanolic yextract of *Crotalaria juncea* seeds in rats. Journal of Yethnopharmacology 1995; 45(3): RR. 167-176.

