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A STUDY OF INFLUENCE OF SOWING TERMS AND NORMS ON CROTALARIA JUNCAE GRAIN YIELD

Nurillaeva Manzura Shavkatovna*; Yakubov Gayrat Kuvondikovich; Negmatova Surayyo Teshaevna***; Khalilova Nargiza Jalilovna******

*Independent Researcher,
Tashkent, UZBEKISTAN
Email id: Manzura_shavkatovna@umail.uz

**Candidate of Agricultural Sciences,
Urgench State University (UrSU), UZBEKISTAN

***Senior Researcher,
Research Institute of cotton selection, seed production and cultivation technologies,
UZBEKISTAN

****Junior Researcher,
Tashkent Agro-chemistry and Soil Science Research Institute),
Tashkent, UZBEKISTAN

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ABSTRACT

The article describes the impact of non-traditional legumes Crotalaria juncea on the optimal sowing time and norms of the number of legumes, the number of grains in legumes, 1000 grain weight and grain yield. It is scientifically substantiated that it is possible to get an additional yield if Crotalaria juncea was sown 10 kg per hektare in early May (1-5.05), the number of legumes would be 15, the number of grains in legumes would be 4.1, the weight of 1000 grains would be 4.9 g compared to the variant sown 20 days earlier and higher to 9 pieces, 2.8 g in proportion to the variant sown 10 days early and as well as it is possible to get the yield at the rate of 5,2-3,8 c/ha when sowing 14 kg of seeds per hectare for a period of 1-5.05 compared to the early sown variants during the same period; 1.9 c/ha compared to the variant planted at 10 kg per hectare; 3.3 c/ha compared to the variant planted at 18 kg for a quality seed crop.

KEYWORDS: *Crotalaria Juncea L., Meadow Alluvial Soil, Planting Time, Norm, Legume, Number Of Grains, 1000 Grain Weight, Yield.*

INTRODUCTION

Rapid population growth in the world, lack of food stocks, long-lasting drought in Australia, rising demand for food in countries such as China and India will require further planting of cereals and legumes. expanding the fodder base requires expanding the type and area of high-calorie fodder as well as food crops to ensure food security and keep it stable.

In order to provide our people with food, address protein shortages, provide livestock with nutritious food and increase soil fertility, it is necessary to increase the number of high-yielding,

high-calorie new varieties and kinds of legumes. In exchange for expanding the area under legumes, first of all, it will provide the population with nutritious and high-quality products, and livestock with cervitamine, mineral-rich feed and increase soil fertility. This is one of the legumes.

Extensive research is being conducted in the world on advanced technology for growing non-traditional legumes, especially Crotalaria juncea. Taking advantage of the potential of crotalia, relying on the scientific basis of specific cultivation technologies, they produce environmentally friendly grain and hay crops and mature fiber products of species and varieties suitable for soil and climatic conditions, rich in protein and vitamins. At the same time, as a result of research on improving agrotechnologies for the cultivation of high-yielding varieties of crotalia, i.e. correct timing and norms of sowing, optimization of mineral and organic fertilizers and the correct application of crop rotation, restore and increase soil fertility, provide livestock with nutritious feed, quality fiber Scientific research is being carried out on

Literature review. Foreign scientists as A. Abdul-Baki, H. Bryan, A. Maroyi, G. Baird, C. Cook, Danielle, S. Gumari from, G. Zinati, C. Cook, C. Orwa, G. White, J. Haun, S. Sarkar, S. Hazra and others **[1-9]** carried researches on the study of biological and morphological features of non-traditional legume crotalia plants, development of seed, selection and cultivation agro technologies and scientists of our republic M. Aberkulov, A. Kiderbaeva, D. Asilbekova, N. Ulchenko, N. Rakhimova, A. Nigmatulaev, A. Glushenkova fulfilled their scientific works on the issue in question.

Crotalaria juncea L. is a tropical Asian plant of the legume family. The origin of Crotalaria juncea is India, where it has been cultivated since the early days of agriculture. It was first reported in Sanskrit literature in 400 BC **[11].**

In some literatures, **[7**] the origin of Crotalaria juncea is not clear, but it has been cultivated in India since ancient times. According to L. Mannetje, this tropical plant came to the West from South Asia in the 19^{th} century.

According to M. Tripathi, B. Chaudhary and others **[11],** Crotalaria juncea L. is a multi-purpose tropical and subtropical legume grown in many countries, especially in India, for high quality fiber. The crop is grown for green manure, to improve the reclamation condition of the soil

According to C.Cook and G.White, L.Purseglove [**6; 8],** Crotalaria juncea is a plant which ecologically cleans the land and biologically controls weed in agriculture.

According to M. Tripati **[11],** green biomass production from Crotalaria juncea planted in India before the monsoon ranged from 22 to 27 t/ha. In Cuba, 3.4 tons of hay was harvested from two crops. In Thailand, when rice is grown as green manure, a high quality crop of 2 t/ha is obtained in 6-8 weeks.

Indian scientists R. Ulemale, D. Giri and R. Shivankar **[10**] studied the effects of planting time, seed size and amount of phosphorus fertilizers on Crotalaria juncea yields. Biomass and seed yields were found to be high when 30 cm of furrows were planted early and 75 kg of phosphorus was applied.

In the research of A. Abdul-baki and others **[4**] Crotalaria juncea was harvested 100 days after planting and grown for another 70 days to increase the amount of nitrogen in the soil. Because Crotalaria juncea blooms 100 days after planting and begins to collect biomass.

In the experiments of M. Aberkulov and others, **[1]** it was found that the thicker the Crotalaria alata plant, the faster the growth of the plant, but the flowering and ripening periods are delayed by 2-3 days or even 4-5 days. **[2**] Experiments have also shown that Crotalaria alata can be planted as a siderate crop and replaced with cotton or rice to produce a good harvest.

The staff of the Institute of Plant Chemistry of the Academy of Sciences of the Republic of Uzbekistan D. Asilbekova and others [**3]** studied the chemical composition and nutritional value of Crotalaria alata. According to her, the protein content of plants grown in Tashkent was 9.3-13.5%, fat 2.3-3.7%, klechatka 22.5-28.9%, ash 10.4-15.3%.

Based on the analysis of the above literature, it can be said that crotalia juncea is a crop that fully meets the needs of our people and has not been fully studied scientifically, it is important to improve agronomic techniques and introduce the results into production. The analysis of the literature shows that no research has been conducted on agronomic techniques, timing and standards of cultivation of non-traditional legumes – crotaliar juncea, which are grown as a main and secondary crop in different soil and climatic conditions of the country. Scientific works abroad have focused on its biology, the physiological processes that take place in it, and its role in increasing soil fertility.

Materials and methods: Research methods were carried out on the basis of the "Methods of State Variety of Agricultural Cultures" (1964, Moscow: Kolos), "Methods of agrochemical analysis of soil and plants" (1977, Tashkent), "Methods of agrophysical research" (1973, Tashkent).

Also, phenological observations, biometric measurements and determination of productivity were carried out on the basis of manuals "Methods of field experiments with grain cultures" (1971), "Methods of conducting field experiments" (UzPITI, 2007).

Field experiments were conducted in the conditions of degraded, saline meadow alluvial soils of Khorezm region. In the experiment, Crotalaria juncea was planted in three different periods (10-15.04; 20-15.04; 1-5.05) and three different norms (10; 14; 18 kg/ha) and the effect of sowing time and norms on its growth, development and yield studied.

The obtained results. It is known that the weight of a crop is determined by the quantity and quality of the elements harvested in the crop. In Crotalaria juncea, too, grain yield depends on the yield elements formed in the plant, i.e. the number of pods and the weight and quality of the grain in it. In turn, the quality of the harvest elements depends on the timing and rate of sowing the seeds.

The yield of legumes is also related to the number of grains and the weight of the grain. However, the abundance of grain is not always the basis for high yields. This is because only if the weight of the grain is at the level of demand, it will ensure a rich and high quality crop. How full the ripe grain is can be estimated based on the weight of 1000 grains. For this reason, the study of the number of grains in Crotalaria juncea legumes and the degree to which grain weight depends on planting dates and norms is of great scientific and practical importance.

In Crotalaria juncea, the emergence of both buds, flowers and pods in a single bush during the entire growing season was observed, and the formation of legume was detected in early June. The newly formed pod was light green in size, measuring 0.5-2 x 0.5-1 cm, and contained 6-8 seeds. The legumes are light brown when ripe and 3-4 (6) cm long. In the experiment, it was observed that 18-67 legumes were formed in one bush of Crotalaria juncea during the application period. Inside the pods were found grains (seeds) with a diameter of 4-6 mm, up to 6-14 gray-olive, dark gray, dark brown and black. 90% of the seeds ripen in mid-to late October.

To get a high and quality grain crop from Crotalaria juncea, it is necessary to correctly determine the timing and rate of planting. This is because when Crotalaria juncea is grown at different times, the influence of physiological processes during the formation of grains in the legumes is strong, resulting in the complete formation of some grains and the immaturity of some grains. For this reason, the formation of legumes, the number of legumes, the number of grains in legumes and the weight of 1000 grains were studied when Crotalaria juncea was grown at different times and norms.

According to the results of the experiment, in the case of September 1, the number of legumes produced per plant according to the options was 30-52; the number of grains in legumes was 8-13.5 grains, the highest results were observed in the variants of crotalyaria sown on the 1st of May, the number of grains compared to the variants sown in the early period was 9-15 grains; the number of grains in legumes was found to be 2.6-4.1 grains higher.

The effect of sowing times on the number of grains and legumes was observed significantly. That is, when Crotalaria juncea was planted on April 10-15, the number of legumes produced per plant was 30-37, the number of grains per pod was 8-9.4, while the number of legumes planted 20 days later (1-5.05) was 42 -52; the number of grains in legumes was 11.6-13.5 and the number of grains in beans was 9-15 grains and the number of grains in legumes was 3.6-4.1 grains higher than in the early sown variants (Table 1).

TABLE 1 NUMBER OF LEGUMES, NUMBER OF GRAINS IN LEGUMES AND WEIGHT OF 1000 GRAINS IN CROTALARIA PLANTED AT DIFFERENT TIMES AND NORMS (2019)

Versions	Planting time	Planting norm, kg/ha	Number of legumes, pieces	Number of grains in legumes, pieces	Weight of 1000 pieces of grain, gr
1-version	10-15.04	10	37	9,4	36,0
2-version		14	36	9,0	35,3
3- version		18	30	8,0	35,0
4- version	20-25.04	10	43	10,7	38,1
5- version		14	40	10,2	36,6
6- version		18	35	9,0	35,7
7- version	1-5.05	10	52	13,5	40,9
8- version		14	50	13,0	39,5
9- version		18	42	11,6	38,4

The lack of biometric indicators in plants planted in the early period can be explained by the fact that Crotalaria juncea is a heat-loving plant and the temperature in these periods was insufficient.

Even when Crotalaria juncea was planted at different planting rates, the legumes and number of grains in legumes was studied and when sown at the rate of 10, 14, 18 kg per hectare on May, 1st, the number of legumes was 42-52 and the number of grains in legumes was 11.6-13.5. It was found that the number of grains in legumes and legumes decreased with increasing planting norms and high results were observed in Crotalaria juncea in low-planted varieties. It was found that with the increase of the sowing rate from 10 kg to 18 kg, the number of pods decreased by 10 units, and the number of grains in pods decreased by 1.9 units.

After the crop was fully ripe, 1000 grain weights were determined in all variants before harvesting. According to the data obtained, the weight of 1000 grains was 35.0-40.9 g according to the options, and with the early planting of the plant and the increase in the norms, a decrease in the weight of 1000 grains was observed.

The reason for the decrease in biometric indicators with the increase of planting norms is the decrease in nutrient area. This is due to the fact that both when sowing 10 kg per hectare and when sowing 18 kg per hectare, the same amount of mineral fertilizers, water and the same agro-technical measures were carried out.

The main task of agricultural research is to scientifically substantiate the impact of agro-technical measures and external factors on crop yields.

It should be noted that different effects of planting time and norms on plant growth, development, yield, and biometric performance were ultimately reflected in the grain yield of crotals.

Grain yields vary depending on cultivation technology, soil and climatic conditions. 450-900 kg per hectare in South Africa; 555-1000 kg in Colombia; In Hawaii, 1460-2240 kg of grain was harvested [5; 10].

Crotalaria juncea has a grain yield of 9.6-18.8 c/ha when sown at different planting times and rates, with a high yield of Crotalaria juncea observed in Option 8 (18.8 c/ha) with 14 kg of seeds per hectare on the 1st of May, at the same rate. 5.2 t/ha compared to variant 2 planted 20 days earlier; 1.9 c/ha compared to option 7, where 10 kg of seeds were sown per hectare; 18 kg of seeds per hectare were sown with an additional yield of 3.3 c/compared to variant 9 (Diagram 1).

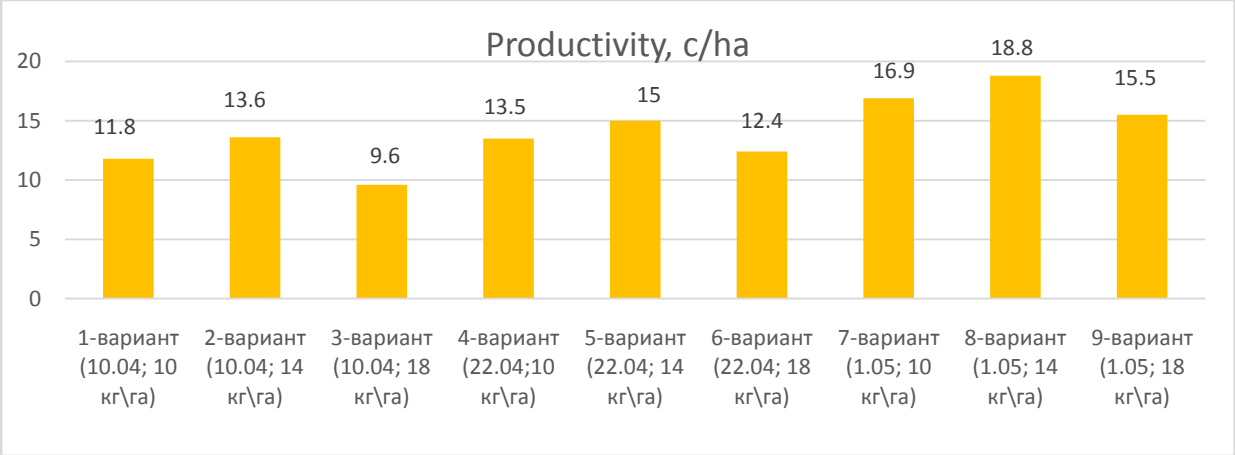

Diagram 1. Influence of sowing dates and norms on grain yield

CONCLUSION

So, in the conditions of degraded meadow alluvial soils of Khorezm region, when planting Crotalaria juncea plant, sowing 10 kg per hectare in early May (1-5.05) is a guarantee to get a higher grain yield – 14 kg per hectare and high quality seed yield.

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