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EFFECT OF STIMULANTS ON DRY MASS WEIGHT OF CROTALARIA JUNCEA

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Abstract

This article discusses that Crotalaria (Crotalaria juncea) plant is planted at the rate of 14 kg per hectare in the conditions of the meadow gray soils of the Jizzakh region, along with the planting of Geogumat biostimulator at the rate of 1.0 l/t and 1.6 l/ha in 3-4 true leaving and branching periods, dry weight of the plant is 94.56 g, 2.42 g of the control variant; Geohumat biostimulant 2.11 g from the variant was used only with planting; It was stated that the biostimulant of grapes was up to 1.22 g more than the variant used only with planting.

Keywords: Crotalaria juncea, Uzgumi, Geohumat stimulants, dry mass amount.

Introduction

Today, the expansion of the area of degraded soils causes a decrease not only in soil fertility, but also in the yield of agricultural crops. Maintaining and increasing soil fertility remains an urgent issue today.

In order to solve this problem, it is necessary to introduce new grain-leguminous crops that improve soil melioration and are resistant to salinity and drought into crop rotation systems. Crotalaria plant can be included among such crops.

Crotalaria is a versatile crop and is also used as a nitrogen-fixing green manure to improve soil quality, reduce soil erosion, conserve soil moisture, control weeds [5], suppress nematodes [6], and recycle plant nutrients.

Crotalaria is also important in crop rotation systems due to its nematode removal, short-term nitrogen fixation and biomass accumulation [4]. When it is planted after cereal crops, it accumulates a large amount of nitrogen and biomass while covering the soil surface and reducing moisture loss [3]. Planting after sugarcane is beneficial because it improves soil reclamation, nitrogen accumulation and weed control.

Crotalaria juncea plant is adapted to different soil and climate conditions by its biological properties. The seed as a food product; hay as a high-calorie fodder in animal husbandry; in increasing soil fertility in agriculture and improving land reclamation; in the treatment of various diseases in medicine; source of nectar in beekeeping; can be used as a fiber source for light industry [1].

Considering the fact that Crotalaria juncea meets the needs of our people in all aspects and is not fully studied from the scientific side, it is urgent to develop and improve the agrotechnologies of its cultivation and to introduce the results into production.

The effect of stimulants on the growth, development and productivity of the plant in the care of Crotalaria was studied in the experiments carried out in the conditions of the gray soils of the meadow of Jizzaakh region. Also, the influence of stimulants on the weight of dry mass of crotalaria was determined during the periods of branching (01.06), flowering (01.07), podding (01.08), ripening (01.09) and full ripening (01.10) (Fig. 1).

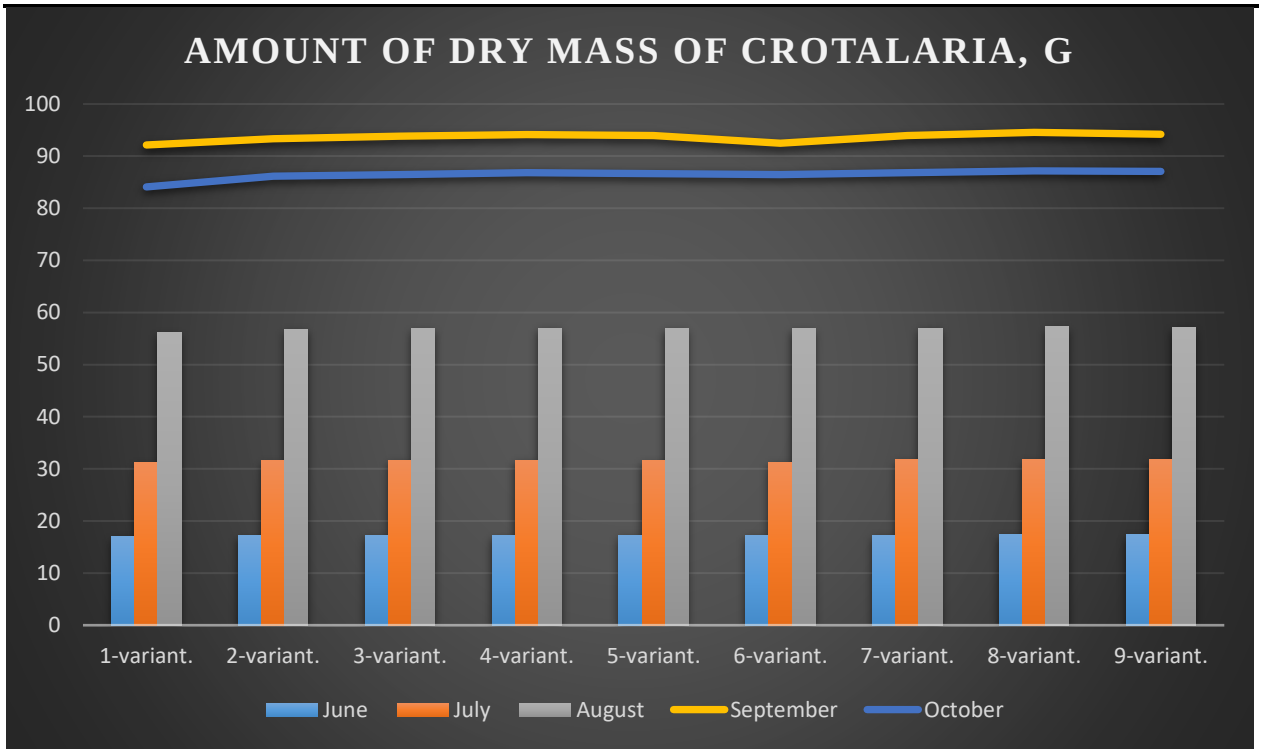

Figure 1. Effect of biostimulants application period and rates on plant dry mass, 2023.

According to the information obtained from the literature [2], to increase the dry mass of one bush of crotalaria, planting it at 10 kg per hectare in 20-25.04, and 14 kg per hectare to increase the dry mass of one hectare is an optimal period and standard for obtaining an abundant harvest from crotalaria.

There are different hypotheses on the accumulation of dry matter in Crotalaria, according to A. Mozambani, R. Sader and L. Pinto [7], the maximum accumulation of dry matter depends on high physiological processes, while H. Lopez, O. Queiroz and L. Moreira [6] states that maximum dry matter accumulation occurs after maximum germination occurs and maximum energy is achieved.

According to the data obtained in 2023 of the experiment, the amount of dry mass in one plant during the cutting period is 17.05 - 17.30 g according to the options; 31.23 - 31.77 g during flowering; 56.11 - 57.23 g in the period of podding, 92.14 - 94.56 g in the period of ripening and 84.09 - 87.17 g in the period of full ripening, the high values in all periods are also high with the planting of Geohumat biostimulator for crotalaria 1.0. It was observed in the 8th variant, which was used at the rate of 1.6 l/ha in 3-4 true leaving and branching periods.

In the period of full ripening, the weight of the dry mass of a bush shows slightly higher values compared to the ripening period, and the increase in the amount of dry mass in a bush during this period can be explained by the fact that the elements of the crop, pods, are produced relatively more in this variant.

According to phenological observations on September 1, the weight of the dry mass of one plant was 92.14 - 94.56 g, and the amount of dry mass in the options with biostimulants was 1.2-2.42 g more than the control variant. The highest rate was 94.56 g in the 8th variant, which used the Geohumat biostimulator at the rate of 1.0 l/t along with planting and 1.6 l/ha in the 3-4 true leaving and branching periods. The weight of the dry mass of one bush of Crotalaria in this variant is 2.42 g more than that of the control variant; 2.11 g of the 6th vaiant, which used Geohumat biostimulant only with planting; The biostimulant of grapes was 1.22 g more than variant 2, which was applied only with sowing.

Conclusion

The dry mass weight of one bush (94.56 g) is high when planting crotalaria (Crotalaria juncea) plant at 14 kg per hectare and using biostimulants in the conditions of gray meadow soils of Jizzakh region and application at the rate of 1.6 l/ha in the period of 3-4 true leaving and branching is considered an optimal period and standard for obtaining an abundant harvest from crotalaria.

References

1. Negmatova S.T. Crotalaria (Srotalaria juncea L.) as an unconventional crop that cleans the land in agriculture. Materials of the republican scientific-practical conference on “Implementation of ecological startups in life” dedicated to the World Environment Day. Tashkent-2022, p. 34-35.
2. Nurullaeva M.Sh., Negmatova S.T. Effect of planting time and rates on dry mass weight of Crotalaria (Crotalaria juncea). Innovative Development in Educational Activities “International conference dedicated to the role and importance of innovative education in the 21 st century 2022/4” Tashkent, 2022. October 12. p.225-229

3. Balkcom K. S., Massey J. M., Mosjidis J. A., Price A. J. and Enloe S. F. "Planting date and seeding rate effects on sunn hemp biomass and nitrogen production for a winter cover crop," International Journal of Agronomy, 2011, p. 8.
4. Braz G. B. P., Oliveira R. S., Crow W. T. and Chase C. A. Susceptibility of different accessions of Crotalaria juncea to Belonolaimus longicaudatus. Nematropica 46: 2016. p. 31–37.
5. Collins A. S., Chase C. A., Stall W. M. and Hutchinson C. M. Optimum densities of three leguminous cover crops for suppression of smooth pigweed (Amaranthus hybridus). Weed Sci. 56: 2008. p. 753–761.
6. Lopes H. M., Queiroz O. A., Moreira L. B. Characteristics agronomics equalidade de sementes de crotalaria (Crotalaria juncea L.) na maturação. Revista Universidade Rural, V. 25, №. 2, 2005. p. 24-30
7. Mozambani A. E., Sader R.; Pinto, L. R. Maturação fisiológica eretardamento de colheita de sementes de crotalária (Crotalaria juncea L.). Revista Brasileira de Sementes, V. 15, №. 1, 1993. p. 55-62
8. Wang K.H., R. McSorley, R.N. Gallaher and N. Kokalis-Burelle. Cover crops and organic mulches for nematode, weed and plant health management. Part II. Nematology 10: 2008. p. 231–242.