Results Of Chemical Treatment Trials Against Juniper Mealybug On Virginian Juniper

Nafasov Zafar Nurmahmadovich
Doctor of Agricultural Sciences, Head of the Laboratory at the Quarantine and Plant Protection Research Institute, 111215, Tashkent, Republic of Uzbekistan
orcid.org/0000-0001-9569-1120, zafar.nafasov85@gmail.com

Obidjanov Dilshod Axmed Xuja ugli
Doctor of Agricultural Sciences, Head of the Laboratory at the Quarantine and Plant Protection Research Institute, 111215, Tashkent, Republic of Uzbekistan
orcid.org/0009-0003-2425-9578, dilshodobidjanov74@gmail.com

Allayarov Nodirjon Jo'rayevich
Senior Researcherof the Laboratory of Quarantine and Plant Protection Research Institute, 111215, Tashkent, Uzbekistan
orcid.org/0009-0008-7950-2615, allayarovnodir78@gmail.com

Muminov Mansur Shodikulovich
Junior Researcher of the Quarantine and Plant Protection Research Institute, 111215, Tashkent, Republic of Uzbekistan
orcid.org/0000-0001-9569-1120,

ABSTRACT

In the Tashkent, Kashkadarya, and Khorezm regions, the biological effectiveness of several long-lasting insecticides was studied against mealybugs infesting Virginian junipers. According to the results, sufficient biological efficacy was observed when using Bi-58 (New), 40% e.c. (1.5–2.0 l/ha), Confidor, 20% e.c. (0.2–0.3 l/ha), and the reference product Bagira, 20% e.c. (0.3 l/ha).

Keywords: Virginian juniper, juniper mealybug, chemical control, pesticides, biological effectiveness.

Due to its ecological stability and capacity to adapt to local climates, Virginian juniper *(Juniperus virginiana*) is commonly planted as an attractive tree throughout Uzbekistan. On these trees, though, a growing number of dangerous insects, especially the juniper mealybug, have been seen in recent years. This bug harms the trees' aesthetic appeal, slows down their pace of growth, and may ultimately cause them to decline or die.

This situation has created the need to maintain the phytosanitary condition of Virginian juniper plantations, preserve their ornamental appearance, and keep the pest population under control. In forest preservation, integrated plant protection methods against pests, diseases, and weeds-including agrotechnical, biological, and chemical controls-play an important role. While agrotechnical and biological control methods are environmentally safe, failure of landscaping, afforestation, and forestry services to implement these methods in a timely manner has led to an increase in damage. Consequently, the need arises to use pesticides for controlling plant pests, diseases, and weeds. In this regard, identifying effective chemical agents and studying their biological

efficacy is of significant scientific and practical importance.

Despite their potential for environmental impact, chemical management technologies are highly effective at maintaining agricultural yields in a short amount of time. Experience has demonstrated that highly effective chemical agents (pesticides) are also regarded as safe when used with appropriate caution. Each crop type's economic threshold level must be established, and pesticides must be used strictly in accordance with the guidelines for dosage and timing. These preparations are highly successful when used properly by people who are aware of their nature and potential drawbacks. They do not hurt people, warm-blooded animals, or the environment.

Control of the juniper mealybug is somewhat complicated. Especially in urban areas with high population density, the use of chemical preparations is limited or must be applied following specific regulations. This is because improper use of chemicals and failure to comply with sanitary laws can pose health risks to people. Experiments were conducted when wind speeds were below 3-4 meters per second. When necessary, spraying was carried out using equipment configured for one-sided application.

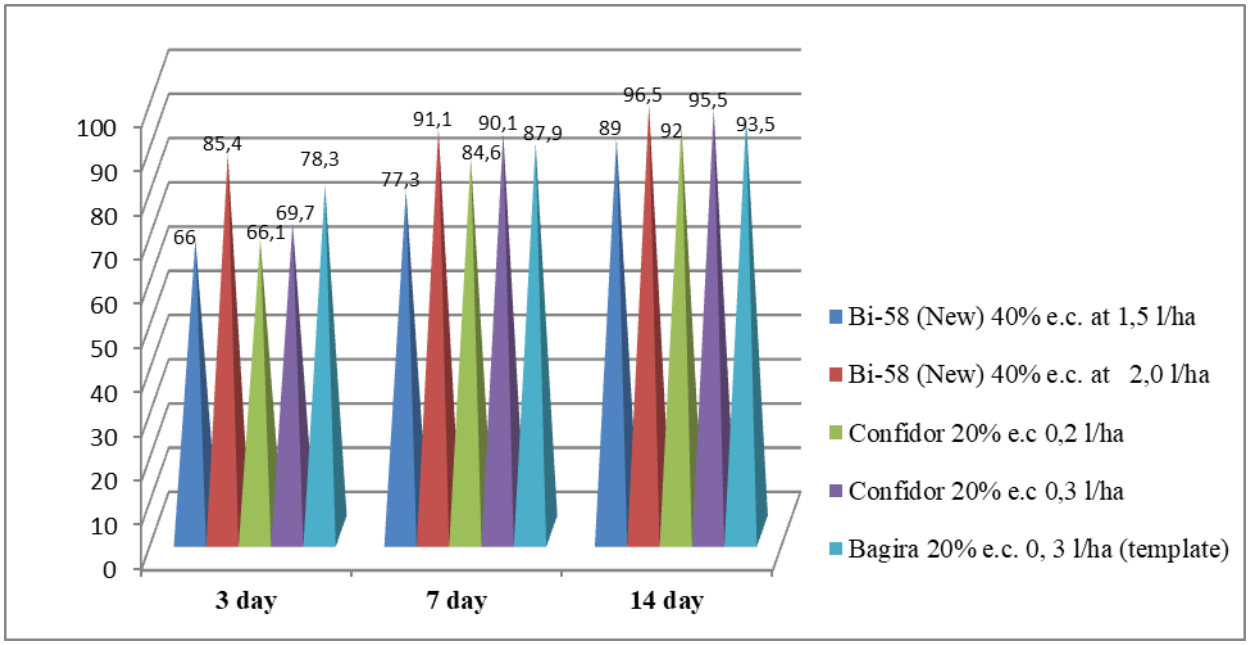
The juniper mealybug can be challenging to control. The use of chemical preparations is restricted or requires adherence to certain rules, particularly in densely populated urban areas. This is because individuals may be at risk of health problems if chemicals are used improperly or hygienic regulations are broken. Wind speeds of less than three to four meters per second were used for the experiments. Equipment designed for one-sided applications was used for spraying when needed.

The purpose of this study was to determine the best agents and assess the efficacy of several chemical insecticides employed against juniper mealybug in the Tashkent, Kashkadarya, and Khorezm regions. By applying several insecticides against mealybugs infesting Virginian junipers in the Tashkent region, the following results were obtained.

Figure 1

Biological efficacy of insecticides against juniper mealybugs

(Tashkent region, Qibray district, working solution, 1000 l/ha, 2025)



The following insecticides were applied per hectare against juniper mealybug: Bi-58 (New), 40% e.c. at 1.5–2.0 l/ha; Confidor, 20% e.c. at 0.2–0.3 l/ha; and Bagira, 20% e.c. e.c. at

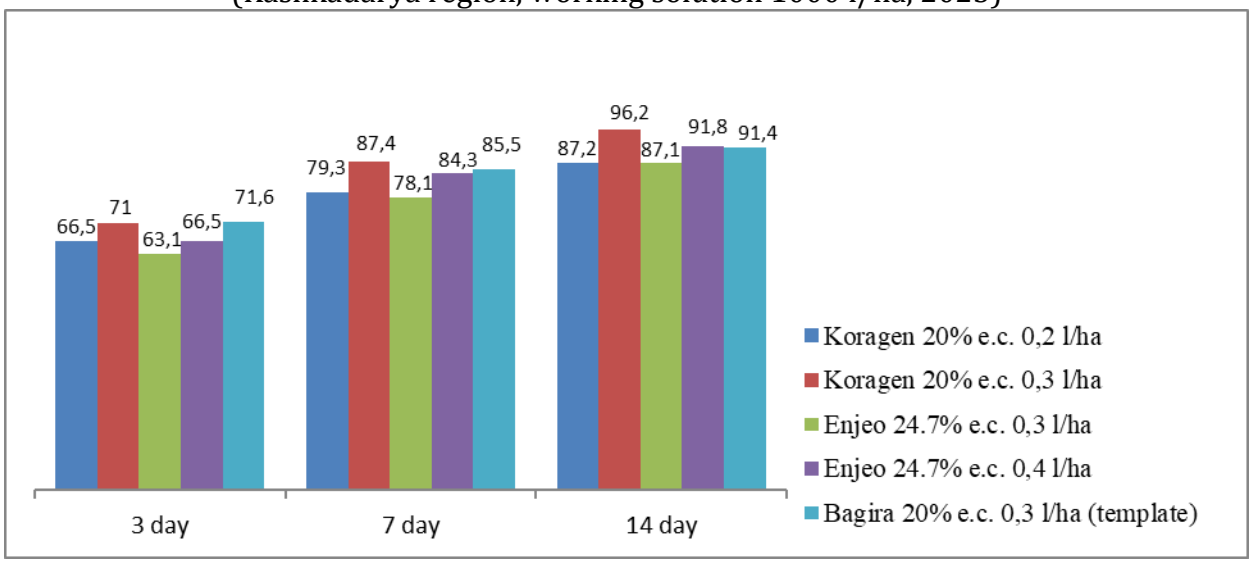
0.3 l/ha as the reference treatment. In the variant where Bi-58 (New), 40% e.c. was applied at 1.5 l/ha, biological effectiveness ranged from 66.0% to 77.3% on days 3 to 7 after treatment, reaching 89.0% on day 14. At the higher dose of 2.0 l/ha, the efficacy was 85.4% on day 3, 91.1% on day 7, and 96.5% on day 14. In the case of Confidor, 20% e.c., applied at 0.2 l/ha, biological efficacy was 66.1% on day 3, and ranged between 84.6% and 92.0% on days 7 to 14. At a higher dose of 0.3 l/ha, the efficacy reached 69.7% on day 3, 90.1% on day 7, and 95.5% on day 14. The template treatment Bagira, 20% e.c., applied at 0.3 l/ha, showed 78.3% efficacy on day 3, 87.9% on day 7, and 93.5% on day 14.

In conclusion, Bi-58 (New), 40% e.c. demonstrated a longer-lasting biological effect against juniper mealybug compared to other groups of insecticides. The template treatment, Bagira, 20% e.c. at 0.3 l/ha, showed biological efficacy ranging from 87.9% to 93.5% compared to the control.

Figure 2

Biological efficacy of insecticides against mealybugs found on Virginian junipers

(Kashkadarya region, working solution 1000 l/ha, 2025)



According to the research results on studying the biological effectiveness of insecticides against juniper mealybug infesting Virginian Juniper in Kashkadarya region:

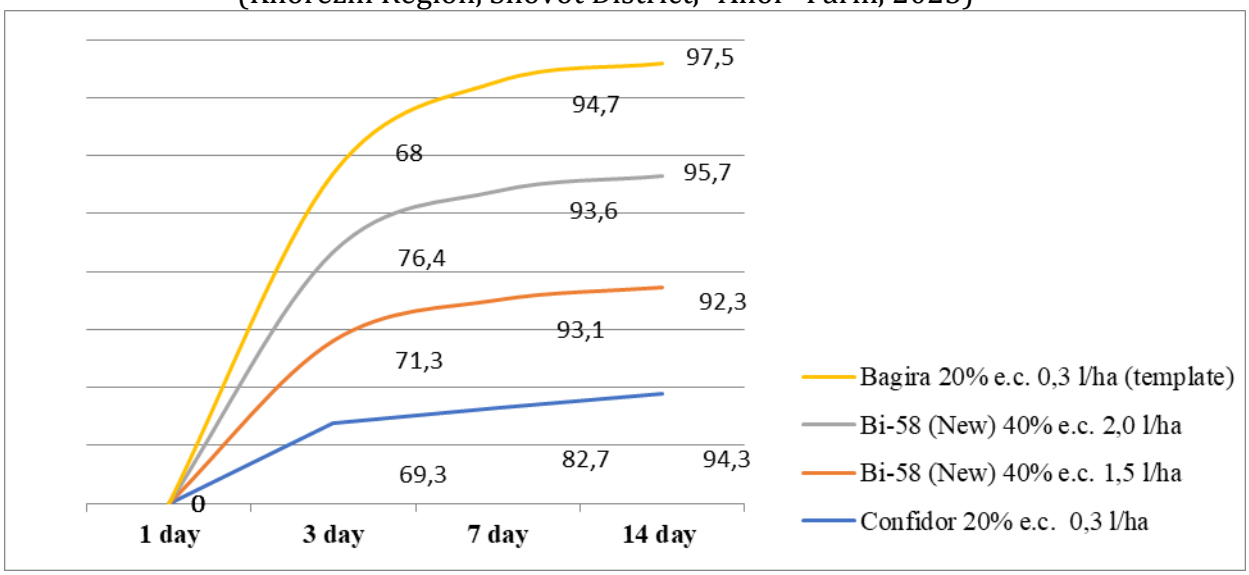
When the preparation Coragen, 20% e.c. was applied at a rate of 0.2–0.3 liters per hectare, biological effectiveness reached 66.5–71.0% on the 3rd day, 79.3–87.4% on the 7th day, and 87.2–96.2% on the 14th day. When Enjeo, 24.7% e.c. was applied at a rate of 0.3–0.4 liters per hectare, biological effectiveness was 63.1–66.5% on the 3rd day, 78.1–84.3% on the 7th day, and 87.1–91.8% on the 14th day. In the template variant, Bagira, 20% e.c. was applied at a rate of 0.3 liters per hectare and achieved 71.6–91.4% biological effectiveness compared to the control.

In conclusion, the experiments showed that applying Koragen, 20% e.c. at 0.3 liters per hectare and Enjeo, 24.7% e.c. at 0.4 liters per hectare resulted in high biological effectiveness of the preparations.

According to the research results on studying the biological effectiveness of insecticides against juniper mealybug infesting Virginian Juniper at the “Anor” farm in Shovot district, Khorezm region:

When the insecticide Confidor, 20% e.c. was applied at a rate of 0.3 liters per hectare against juniper mealybug on junipers, observations were conducted over 14 days. Specifically, Confidor, 20% e.c. applied at 0.3 l/ha showed biological effectiveness of 69.3% on the 3rd day, 82.7% on the 7th day, and 94.3% on the 14th day.

Figure 3
Biological Effectiveness of Chemical Preparations Against Juniper Mealybug
(Khorezm Region, Shovot District, "Anor" Farm, 2025)



When the new Bi-58, 40% e.c. preparation was applied against juniper mealybug on Virginian Juniper at two different dosages, the following results were obtained. When Bi-58, 40% e.c. was applied at a rate of 1.5 liters per hectare, biological effectiveness was 71.3% on the 3rd day, and 93.1% and 92.3% on the 7th and 14th days, respectively. When the preparation was applied at a rate of 2.0 liters per hectare against juniper mealybug, observations were conducted over 14 days. Biological effectiveness compared to the control was 76.4% on the 3rd day, 93.6% on the 7th day, and the highest at 95.7% on the 14th day. All results are presented in Figure 3.

Conclusion. To prevent the increase of the juniper mealybug, one of the most destructive pests of virgin pine trees in all regions of our country, timely and proper implementation of integrated protection measures will achieve the desired goal.

References:

1. Allayarov N.J., Nafasov Z.N., Abdumuminova M.M. Biological efficiency of Duplet TT 22.5% em.c. preparation against the main diseases of juniper// Texas Journal of Medical Science. October, 2024. – P.1-6.
2. Nafasov Z.N. Igna bargli daraxtlarni zararkunandalardan uyg'unlashgan himoya qilishning nazariy va amaliy asoslari// Monografiya. "Science and Innovation" nashriyoti, – Тошкент, 2024. – 308 б. ISBN 978-9910-9206-6-0.
3. Nafasov Z.N., Obidjanov D.A., Allayarov N.J., Muminov M.SH., Hoshimova D.K. Biological effect of chemical preparations against the main diseases of pine// The American journal of agriculture and biomedical engineering (ISSN – 2689-1018) Volume 06 ISSUE 08

https://doi.org/10.37547/tajabe/Volume06 Issue 08-04. - P.17-20.

4. Мухсимов Н.П., Нафасов З.Н., Жўраева Д.Ф. Арча унсимон қурти (*Planococcus vovae* Nass.) ва унга қарши уйғунлашган кураш чоралари. Ўрмончиликни ривожлантиришда фан ва технологияларнинг роли. Республика илмий амалий анжумани. – Тошкент, 2022. – Б.87-98.