COMPARATIVE ANALYSIS OF HERBICIDES USED FOR WEED ELIMINATION IN WINTER WHEAT CULTIVATION.

Sulliyeva Suluv Xurramovna[1]

Candidate of Biological Sciences, Associate Professor of the Faculty of Natural Sciences of Termez State University[1]

Annatation: This article describes various weeds found in winter wheat fields and methods of their destruction using various herbicides. Information is also provided on the effects of several types of herbicides used to eliminate weeds found on winter wheat fields and their effectiveness.

Key words: autumn wheat, weeds, herbicides, cereal crops, dicotyledonous plants, effectiveness, broad-spectrum impact, selective effect, dosage.

Introduction: Because spiked grain crops are sown densely and are not subjected to special cultivation practices, weeds are able to grow unchecked among them. As a result, they compete for water and nutrients, cast shade, and create favorable conditions for the spread of diseases, pests, insects, and other harmful factors—ultimately reducing both grain yield and quality by 40–50 percent. When grain crops are cultivated on irrigated lands, the stagnant growth and development of weeds become even more damaging, as such conditions further encourage their rapid spread. Therefore, the use of environmentally safe and highly effective herbicides has become essential for controlling weeds in winter wheat fields.

Purpose of work: The study of the influence and effectiveness of various herbicides, particularly Granstar and Puma, on weeds found in winter wheat fields.

Research object: The object of the study was a wheat field planted in the autumn on irrigated lands of the Surkhandarya region, experiments were conducted and the results were analyzed.

Research Methods: In this study, two different herbicides were selected as the primary research tools, and their various dosages and application techniques were examined in order to assess the overall effectiveness of each herbicidal treatment.

Results: The elimination of both dicotyledonous and grass-like weeds in winter wheat fields is closely influenced by the specific herbicide used, as well as the dosage applied and the method of its application. The management of weeds in winter wheat fields is largely determined by the herbicide selected, alongside the method and timing of its application.

Because herbicides differ in their selective action, Puma Super demonstrates strong effectiveness against cereal weeds, whereas Granstar performs best against dicotyledonous species. Consequently, the timing of application plays a major role: when

Puma Super was applied at a rate of 1 L/ha, no suppression of dicotyledonous weeds was observed. However, applied on March 20, it eliminated 89.9–92.9% of grassy weeds, and when applied on April 10, its effectiveness increased slightly to 89.5–93.8%. The higher efficiency of Puma Super applied at the same rate (1 L/ha) on April 10—approximately 20 days later—can be attributed primarily to rising temperatures. As air temperature increases, physiological processes within weeds become more active, thereby enhancing the performance of systemically acting herbicides such as Puma Super in controlling cereal-type weeds. As noted, by April 10 the density of weeds per square meter had increased by 44 individuals compared to March 20, and the weeds had grown slightly, increasing their vegetative mass. Despite this, Puma Super applied on April 10 still showed up to 1.1% higher efficacy than on March 20. At both application times—March 20 and April 10—the 1 L/ha rate of Puma Super produced no observable impact on dicotyledonous weeds in winter wheat fields.

Therefore, applying Puma Super at a rate of 1 L/ha in early April under the conditions of the experimental region proves to be highly effective for controlling wild oats, sedges, and other grass-type weeds in winter wheat fields.

Granstar herbicide demonstrates greater effectiveness against dicotyledonous weeds in winter wheat fields when applied on April 10 compared to March 20. This is because the efficacy observed at a rate of 15 g/ha on March 20 was slightly lower than the results obtained on April 10. Specifically, when Granstar was applied at 15 g/ha on March 20, its effectiveness against dicotyledonous weeds ranged from 84.6% to 87.5%, depending on the weed species. In contrast, when applied on April 10 at the same rate, its efficacy increased notably, reaching 90.0–95.7% across different weed types. It was also noted that the 15 g/ha application rate of Granstar exhibited no activity at all against cereal-type (spike) weeds in winter wheat fields.

Therefore, applying Granstar herbicide at a rate of 15 g/ha in early April is considered a highly effective approach for controlling dicotyledonous weeds developing in winter wheat fields on the irrigated lands of the Surkhandarya region.

However, while Puma Super effectively controls grass-type weeds in winter wheat fields, dicotyledonous weeds continue to develop. Conversely, if dicotyledonous weeds are treated only with Granstar at a rate of 15 g/ha, grass-type weeds will proliferate and may destroy nearly half of the winter wheat yield.

Therefore, one of the variants in our field experiments involved investigating the control of both grass-type and dicotyledonous weeds through a single application by combining Puma Super and Granstar herbicides.

For this purpose, Puma Super at 1 L/ha and Granstar at 15 g/ha were applied on March 20 and April 10 in order to control both grass-type and dicotyledonous weeds in winter wheat fields. The results showed that the level of weed suppression varied

depending on the weed species and the timing of application. When the two herbicides were mixed and sprayed on March 20, their combined effectiveness against dicotyledonous weeds ranged from 86.0% to 100.0%, while their effect on grass-type weeds ranged from 7% to 91.7%.

When Puma Super (1 L/ha) and Granstar (15 g/ha) were mixed and applied together, their combined effectiveness against both grass-type and dicotyledonous weeds in winter wheat fields was higher on April 10 than on March 20. Specifically, when the mixture was sprayed on April 10, the weed-control efficiency in wheat fields increased by up to 25.7% compared to the results obtained on March 20.

When compared to the total number of all weed species present in the winter wheat field, the combined application of Puma Super (1 L/ha) and Granstar (15 g/ha) resulted in a 75% overall weed-control rate when sprayed on March 20. When the same mixture was applied on April 10, the total weed-kill rate increased to 82.3%. Naturally, among the weeds that survived were species outside the dicotyledonous and grass-type groups, which are not susceptible to the modes of action of Puma Super and Granstar.

It should be noted that while dicotyledonous and grass-type weeds develop and mature concurrently with wheat on irrigated lands, other weed species are unable to flower and germinate during this period. These species generally begin to grow actively only after the winter wheat crop has been harvested.

According to the overall findings, the combined application of Puma Super (1 L/ha) and Granstar (15 g/ha) controlled 93.3% of white salamander weed when applied on March 20, and 88.3% when applied on April 10. Similarly, wild oat control reached 85.7% on March 20 and 89.5% on April 10. Based on all observations, these herbicides can be considered a highly effective means of weed management in winter wheat fields toward the end of April. During this period, although both weed density and wheat growth have increased significantly, the germination of newly emerging dicotyledonous and grass-type weeds has ceased, eliminating the need for repeated herbicide applications.

Conclusion: Because winter wheat is sown in narrow rows on the soil surface, herbicide treatments are applied using tractor-mounted sprayers, and the movement of tractor wheels can expose, damage, or destroy a certain portion of the wheat plants. For this reason, combining compatible herbicides and applying them in a single treatment—targeting both dicotyledonous and grass-type weeds simultaneously—serves as an efficient and practical weed-control strategy.

Therefore, we recommend that in the Surkhandarya region—as well as in other regions—Puma Super (1 L/ha) and Granstar (15 g/ha) be mixed and applied in early April, after the winter wheat plants have fully emerged, as an effective method for controlling both dicotyledonous and grass-type weeds in winter wheat fields.

List of used literature:

1. Decision of the President of the Republic of Uzbekistan "On additional measures to introduce the market principle in the production and sale of grain", PQ-262, 28.05.2022.

2. Закиров Т.С. Культура земледелия в орошаемых условиях Узбекистана. - Т.: «Ўзбекистон», 1979.

3. Ermatov A. Irrigated farming. T.: "Teacher", 1983.

4. Rashidov M. I. and others. Recommendations for the use of Granstar herbicide in grain fields. Tashkent, 1998.

5. Oripov R., Khalilov N. Plant science. T., 2006.

6. Ibragimov Z.A. Field weeds and their control in short-rotation grain rotation (Nauchn.tr. KIEI, vip.1), 1996

7. Kholmatov M.Kh., Akramov B. Effectiveness of chemicals in the fight against weeds, diseases and pests in irrigated grain fields. "Cotton and grain farming" //J: No. 2, 2000

8. Elefferohorinos T. G. Weeds competition from Callium Aparine 1 and Veronica Persica Poir in Winter Wheat and their control by chlorsulfuron. //Aspects. №9,1985

9. Dependence of stem lodging resistance of winter wheat on weed control. Sullieva Suluv Khurramovna, JOURNAL OF AGRICULTURE & HORTICULTURE Volume 4, Issue 6, 55-58.

10. Dependence of winter wheat growth and development on the level of weed control. Sullieva Suluv Khurramovna, JOURNAL OF AGRICULTURE & HORTICULTURE Volume 4, Issue 6, 52-54.