Volume 3, Issue 12, December - 2025
ISSN (E): 2938-3781

Web of Agriculture: Journal of Agriculture and Biological Sciences
webofjournals.com/index.php/8

EFFECT OF FOLIAR FEEDING WITH LIQUID NITROGEN FERTILIZERS ON THE GROWTH AND DEVELOPMENT OF WINTER WHEAT

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Abstract
In this article winter wheat liquid nitrogen fertilizer Application of standards and deadlines of winter wheat Study the effects on growth and development It is a pressing issue to continue scientific research on improving the agrotechnology of winter wheat cultivation in order to increase the yield and quality of wheat grain and to obtain high-quality grain crops. Therefore, the aim of winter wheat care is to achieve high-quality grain crops by improving the agrotechnology of winter wheat cultivation and improving the quality of winter wheat grain by using liquid nitrogen fertilizers.

Keywords: Liquid nitrogen fertilizer, winter wheat, field area, leaf, application, rate, period, option, height, number of joints, ear, yield.

Introduction

The Decree of the President of the Republic of Uzbekistan No. PF-4947 dated February 7, 2017 “On the Strategy of Actions for the Further Development of the Republic of Uzbekistan” identifies “3.3... the sustainable development of agricultural production, further strengthening of the country's food security, expansion of the production of environmentally friendly products, further optimization of arable land, and the introduction of modern resource-saving agrotechnologies” as important strategic tasks[1;].

The Decree of the President of the Republic of Uzbekistan No. PF-5853 dated October 23, 2019 “On approval of the Strategy for the Development of Agriculture of the Republic of Uzbekistan for 2020-2030” [On approval of the Strategy for the Development of Agriculture of the Republic of Uzbekistan for 2020 — 2030] established the “development and implementation of a state policy on food security” as a priority, which provides for improving the food consumption of the population. In implementing these tasks, it is important to expand the scope of scientific research aimed at cultivating high-quality and high-yielding grain products of winter wheat, which is grown in the soil and climatic conditions of our republic[2;].

One of the urgent issues in increasing the yield and grain quality of winter wheat is to continue scientific research on obtaining high-quality grain yields by improving agrotechnologies for growing winter wheat varieties. Therefore, it is important to carry out scientific research on

Volume 3, Issue 12, December - 2025
ISSN (E): 2938-3781

obtaining high-quality grain yields based on studying the processes of feeding winter wheat with liquid nitrogen fertilizer using new agrotechnologies in winter wheat care.

Literature Analysis and Methodology

Based on the above, we set the main goal of conducting research on the development of agrotechnology for growing high-quality grain crops by studying the norms and timing of applying the new "Uni-agro" and "Super-KAS" liquid nitrogen fertilizers in suspension form, produced by "Fergonaazot" JSC, in the care of winter wheat in the conditions of the meadow soils of the Fergana region.

Our research is planned to be conducted in 2019-2021, and the use of Uni-agro and Super-KAS liquid fertilizers in the care of winter wheat of the Grom variety was studied, comparing the established rates of 3-6-9 l/ha with the control and standard options.

Observations and laboratory analyses in the experiment were conducted based on the UzPITI Methodological Manual “Methods of conducting field experiments” [3; (2007)]. The experimental field had 8 rows, row spacing of 60 cm, width of 4.8 m, height of 30 m, area of 144 m2, total area of 3456.0 m2, and winter wheat of the “Grom” variety was planted in Uni-agro and Super-KAS 3 rotations.

Also, the textbook “Assessment and Control of the Quality of Grain and Grain Products” by R. Khaitov, R. Zuparov, Z. Shukurov [4; (2002)] was used.

According to Abdualimov Sh. [5; (2006)], feeding with mineral fertilizers has a significant effect on the number and weight of wheat grains. In particular, if nitrogen is not enough for ear formation, the number of grains per ear decreases.

The experiment studied the use of liquid fertilizers as suspensions in winter wheat care and their effect on winter wheat ear or grain quality indicators, based on phenological observations and laboratory analyses.

In the 2020 field experiment, the biological state of plant growth and development was monitored through phenological observations and assessed by analyzing the changes occurring in them.

In field experiments, the biological state of the plant was studied through phenological observations before foliar feeding with Uni-agro and Super-KAS liquid nitrogen fertilizers, that is, on April 10, 2021. When observing the growth and development of plants before the planned application of liquid fertilizers in the experiment, there was almost no difference in the options.

Karabaev, I. T., Karimov, Sh. A., Davronov, K. A., & Ibragimov, O. O.[6;According to the information provided by [139-143 b],Observations in the experiment showed that liquid fertilizers should be applied at the beginning of the winter wheat tillering period. In this regard, the experiment began on April 10. The winter wheat was sprayed with a working solution of Uni-agro and Super-KAS liquid nitrogen fertilizers on the leaves on April 15. In the procedure specified in the experimental variants, a working solution was prepared and sprayed at the rate of 300 liters of water per hectare with Uni-agro at a rate of 3-6-9 l/ha, Super-KAS at a rate of 3-6-9 l/ha, and Suspension (urea) at a rate of 5 kg/ha.

Results and Discussion

In the experiments conducted, when we analyzed the results of phenological observations of the biological state of winter wheat on May 10, 2021, it was observed that the variants in which Uni-

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agro and Super-KAS fertilizers were used had a significant effect on plant growth and development compared to the control variant.

Table 1 The effect of Uni-agro, Super-KAS application on plant growth and development during the tillering period of wheat (2021).

No.	Experience options	Processing standard, l/ha	Plant height, cm	Number of syllables	Plant height, cm	Number of syllables	Plant height, cm	Number of syllables
			15.04	15.04.	27.04	27.04	12.05	12.05.
1.	Control	-	57.1	2.6	88.5	3.2	90.3	4.0
2.	Suspension (Urea)	5 kg/ha	58.5	2.6	90.2	3.2	94.1	4.5
3.	Uni-agro	3 l/ha	60.5	2.6	89.6	3.2	93.8	4.5
4.	Uni-agro	6 l/ha	65.2	2.8	90.6	3.1	99.3	4.8
5.	Uni-agro	9 l/ha	62.9	2.7	92.1	3.2	96.1	4.6
6.	Super-casual	3 l/ha	64.1	2.7	92.8	3.2	96.1	4.6
7.	Super-casual	6 l/ha	63.3	2.8	93.7	3.3	98.2	4.7
8.	Super-casual	9 l/ha	63.5	2.6	90.7	3.1	93.4	4.5

Results and Discussion

According to the results of the observations, the average plant height in the control variant was 96.3 cm, and the number of joints was 4.1. In the variants where liquid fertilizers were applied, the average plant height was 96.1-99.3 cm, and the number of joints was 4.6-4.8, which was 0.8-3.0 cm higher and the number of joints was 0.2-0.7 higher than in the control.

From the observation results obtained, it can be seen that the variants in which Uni-agro and Super-KAS fertilizers were used had slightly higher plant height and number of joints. In particular, it was found that the variants used at rates of 6-9 l/ha had significantly higher plant height. In this case, the observation of the growth and development of winter wheat was initially taken on April 10, 2021, and when the biological state of the plant was phenologically observed according to the variants before the application of liquid fertilizers (10.04.2020), almost no significant difference was observed between the variants. However, in the subsequent observation periods, it was found that the variants treated with liquid fertilizers differed from each other compared to the control variant. In this case, it was determined that in variants 4-5 (at the rate of 6-9 l/ha) of Uni-agro, which is a liquid fertilizer, and in variants 8 (at the rate of 9 l/ha) of Super-kas, the height and number of joints of wheat increased. Of course, it can be said that this is due to the effect of the liquid fertilizers used. The following observations will analyze what results this situation leads to. It is known that the length of the ear of winter wheat, the number of grains per ear, the weight of grains per ear, and the weight of 1,000 grains are important indicators of the yield of this wheat plant.

In the experiment, it was observed that the use of liquid fertilizers as suspensions in the care of winter wheat also had a specific effect on the quality indicators of winter wheat ears or grains (Table 2).

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Table 2 Winter wheat is classified by ear length, number of grains per ear, and its The effect of new liquid nitrogen fertilizers on weight

No.	Experience warrants	Plant height, cm	One ear of corn length, cm	The number of grains in 1 ear is in grains.	Grain weight in 1 ear, gr
1.	Control	96.3	9.9	53.2	2.3
2.	Suspension (Urea) 5 kg/ha	97.1	10.0	50.9	2.4
3.	Uni-agro 3 l/ha	91.8	10.5	58.8	2.4
4.	Uni-agro 6 l/ha	96.1	9.8	53.7	2.4
5.	Uni-agro 9 l/ha	99.3	9.4	56.3	2.6
6.	Super-cas 3 l/ha	98.2	9.6	53.2	2.9
7.	Super-cas 6 l/ha	84.1	9.9	53.9	2.0
8.	Super-cas 9 l/ha	93.4	8.9	50.4	2.1

Based on the data obtained in the experiment, when analyzing the variants by comparing them, in the control variant, the average plant height was 96.3 cm, the number of nodes was 5.1, the spike length was 9.9 cm, the number of grains per spike was 53.2, and the weight of grain per spike was 2.5 grams. In addition, when the plant was foliarly fed with liquid nitrogen fertilizers, the average plant height in the variants was 91.8-99.3 cm, the number of nodes was 4.6-4.9, the spike length was 9.4-10.5 cm, the number of grains per spike was 53.2-58.8, and the weight of grain per spike was 2.1-2.9 grams.

When we looked at the differences in the experimental variants, it was observed that compared to the variants where Uni-agro liquid nitrogen fertilizer was applied at a rate of 5 l/ha and Super-KAS fertilizer was also applied at a rate of 5 l/ha as a control and carbamide suspension was applied as a standard, the plant height increased by 1.0-1.9 cm, the number of joints by 0.1-0.2 grains, the spike length by 0.6-1.0 cm, the number of grains per spike by 0.9-5.6 grains, and the grain weight per spike by 0.2-0.4 grams. Thus, it was determined that the application of Uni-agro and Super-KAS fertilizers as a suspension from the leaves of wheat affected not only the plant height, but also its grain quality indicators.

Conclusion

In conclusion, in the first year of the Grom variety experiment, it was found that the newly developed Uni-agro and Super-KAS liquid nitrogen fertilizers had a significant effect on the control untreated variant and the variant with the application of a standard urea suspension.

Accordingly, the additional use of newly developed liquid nitrogen fertilizers as a suspension in winter wheat care has a positive effect on the grain quality indicators of winter wheat.

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