

**THE INFLUENCE OF GROWTH REGULATORS AND PESTICIDES ON THE PRODUCTIVITY
FORMATION OF KHORASAN WHEAT (*TRITICUM TURANICUM* JAKUBZ.)
IN THE EASTERN PART OF THE NORTHERN STEPPE OF UKRAINE**

O. M. Butenko, O. O. Viniukov, O. B. Bondareva, H. A. Likhushyna

Donetsk State Agricultural Research Station of NAAS of Ukraine, 1 Zakhysnykiv Ukrainy St., Pokrovsk, Donetsk region, 85307, Ukraine

Topicality. Durum wheat is of great importance due to its excellent quality properties, which contribute to the provision of high-quality food to the population. *Triticum turanicum* Jakubz, a species genetically related to durum wheat, should be widely disseminated. Solving this problem requires the study of agrotechnological methods of growing Khorasan wheat, including the application of growth inhibitors and pesticides, which contribute to the formation of high plant productivity. **Purpose.** To establish the effect of growth regulators and protection systems on the growth and development of Khorasan wheat (*Triticum turanicum* Jakubz.) plants in the conditions of the eastern part of the Northern Steppe of Ukraine. **Materials and Methods.** Research was conducted in the field crop rotation of the Donetsk State Agricultural Research Station of NAAS according to the method of field work by B. O. Dospekhov in 2022–2024. Khorasan wheat of the Sarmat variety was used for sowing. Two growth regulators were studied: Chlormequat chloride and Tava, which were sprayed on plants in different development stages. The plant protection system included two variants: System 1 – Sheriff herbicide (20 g/ha) at the beginning of tillering stage; Paracelsus fungicide (0.5 l/ha) at the first internode stage; Presto insecticide (0.4 l/ha) at the heading stage; System 2 – tank mixture of Primus herbicide (0.5 l/ha.), Dot fungicide (0.5 l/ha.) and Presto insecticide (0.4 l/ha.) in the second internode stage. The research methods used were the following: field, laboratory, mathematical and statistical. **Results.** According to the analysis of plants in the full ripeness stage, spraying with Chlormequat-chloride at the first internode stage resulted in the lowest plant height 110.5 cm (System 1) and 110.3 cm (System 2) in the experiment. It was found that growth inhibitors and the application date increased the number of grains per head by 3.0–4.0 grains compared to the control. Spraying with Chlormequat-chloride at the first internode stage provided an increase in yield of 1.4 t/ha compared to the control, and at the tillering stage, the application of this growth inhibitor increased the yield by 1.8 t/ha. The highest yield level in the experiment was achieved by spraying the crops with Tava at the first internode stage (+2.0 t/ha compared to the control), while its application at the second internode stage provided an increase in yield of 1.5 t/ha. **Conclusions.** We found that the expediency of applying growth inhibitors together with pesticides in the Khorasan wheat cultivation is conditioned not only by increasing the lodging resistance of plants, but also by the formation of better plant productivity indicators in the eastern part of the Northern Steppe of Ukraine.

Key words: Khorasan wheat, plant development stages, growth inhibitors, plant protection system, biometric indicators, yield attributes, yield

Introduction. Increasing grain production is one of the priority areas of development of Ukrainian agriculture [1–3]. Cereal crops play a major role in this issue [4–7].

Food security of the population of Ukraine and improvement of the efficiency of the crop production sector requires revision of the structure of crop production areas to grow not only ‘profitable crops’, but primarily crops (durum wheat, millet, buckwheat, chickpeas, lentils, etc.)

that provide adequate human nutrition [8, 9]. Durum wheat contains a wide range of vitamins, minerals and other essential nutrients, compounds that are vital for human nutritional needs [10]. The species *Triticum turanicum* Jakubz. (*T. turgidum* subsp. *turanicum* Jakubz.), known as Khorasan wheat, is genetically close to durum wheat [11].

The soil and climatic conditions of Ukraine are generally favourable for wheat cultiva-

Author information:

Oleksandr M. Butenko, Junior Researcher, e-mail: butenko_a@ukr.net, <https://orcid.org/0009-0003-2054-665X>

Oleksandr O. Viniukov, Doctor of Agricultural Sciences, Professor, Director, e-mail: alex.agronomist@gmail.com, <https://orcid.org/0000-0002-2957-5487>

Olha B. Bondareva, Candidate of Technical Sciences, Senior Researcher, Scientific Secretary, e-mail: olbraun58dds@ukr.net, <https://orcid.org/0000-0002-8128-8485>

Hanna A. Likhushyna, PhD in Agronomy, Senior Researcher, Head of the Department of Plant Breeding, Seed Production and Agricultural Production Technologies, e-mail: anna-ch-y@ukr.net, <https://orcid.org/0000-0002-0250-2456>

tion [12–14], but there are problems associated with optimising the physiological processes in plants, namely, reducing plant height while forming stronger culm [15]. Plant height of Khorasan wheat is one of the main technological problems. Khorasan wheat plants growing up to 135 cm tall with 3.5–4 mm thick culm are not resistant to lodging due to poor development of mechanical tissues in the three lower internodes. This significantly complicates the harvesting process and worsens the quality of the product. The growth inhibitors market offers a large number of formulations that promote the regulation of growth processes when applied at certain stages of plant development [16–19]. However, no research on their effect on Khorasan wheat plants has been conducted.

An equally important issue is the development of a plant protection system. According to Kalenska S. M., Bazalii V. V. and other scientists [20, 21], the minimal chemical protection of spring wheat crops resulted in an increase in yield compared to the control of 0.24–1.32 t/ha in Elehiia Myronivska variety and 0.22–1.29 t/ha in Simkoda Myronivska variety, and intensive protection resulted in an increase of 0.29–1.48 t/ha and 0.28–1.61 t/ha, respectively. The fact that spring wheat species in the Steppe ripen 10–15 days later than winter wheat species, and they are subject to massive pest infestation, especially in the last stages of organogenesis. The majority of insecticides cannot be used at the end of the heading stage, and the application of formulations at earlier stages does not provide sufficient protection. Therefore, the question arose of determining the most appropriate plant protection system for Khorasan wheat, which would provide maximum crop protection during the growing season.

The research was aimed at determining the effect of inhibitors and protection systems on the plant growth and development of Khorasan wheat (*Triticum turanicum* Jakubz.) in the eastern part of the Northern Steppe of Ukraine.

Materials and Methods. The research was carried out in the breeding crop rotation of the Donetsk State Agricultural Research Station of NAAS in 2022–2024. The soil was ordinary low-humus heavy loamy chernozem. The humus content was 4.9 %, the pH was slightly alkaline, close to neutral, content of total nitrogen was 0.22, and phosphorus – 0.14 %.

The experiments were repeated three times. The registration area of the plot was 25 m².

The predecessor was sunflower. Soil tillage in the pre-sowing period was aimed at maximising the preservation and accumulation of soil moisture and weed control.

Khorasan wheat of Sarmat variety (PU No. 230611 dated 25.10.2023) was sown in the experiment. Sowing was carried out with a self-propelled sowing machine SPS-7. The sowing method was solid drilling with 15 cm row spacing. The depth of seed placement in the soil was 5–6 cm. Soil compaction was carried out with sprocket packer 3KKSh-6A to improve the conditions for seed germination.

Except for the questions posed in the study, the cultivation technology was generally accepted for spring cereals in the eastern part of the Northern Steppe and was in line with zonal and regional recommendations. Two growth inhibitors were used in our research: Chlormequat-chloride and Tava, which were sprayed on plants at different stages of organogenesis.

The protection system included two variants: – *Protection system 1* included Sheriff herbicide (20 g/ha, at the beginning of tillering stage); Paracelsus fungicide (0.5 l/ha, at the first internode); Presto insecticide (0.4 l/ha, at the heading stage);

– *Protection System 2* in the form of a tank mixture of Primus herbicide (0.5 l/ha), Dot fungicide (0.5 l/ha) and Presto insecticide (0.4 l/ha) at the second internode stage.

The main research method was field trials, which were supplemented by analytical studies, measurements, calculations and observations in accordance with generally accepted methods and recommendations in plant production [22]. The statistical evaluation was performed using application software package for processing breeding and genetic experiments

Results. Growth inhibitors application leads to the formation of wheat plants with shortened internodes and a larger leaf area.

At the end of tillering stage, biometric parameters of Khorasan wheat had no significant differences under both protection systems (Table 1).

At this stage, the plant height was 50.0 cm. Regardless of the experimental variant; the plants formed an average of 2.4 shoots and 2.6 secondary roots. No differences between the

Table 1. Biometric parameters of Khorasan wheat plants at the end of the tillering stage, 2022–2024

Protection system	Application of growth inhibitor	Height, cm	Tillering coefficient	Number of secondary roots per plant, pcs.
Protection system 1*	Control	50.1	2.4	2.6
	Chlormequat-chloride 1.5 l/ha (full tillering)	50.0	2.4	2.7
	Chlormequat-chloride 1.5 l/ha (first internode)	50.1	2.5	2.5
	Tava 0.75 l/ha (first internode)	50.1	2.4	2.6
	Tava 0.75 l/ha (flag leaf)	50.0	2.5	2.6
Protection system 2**	Control	50.0	2.4	2.5
	Chlormequat-chloride 1.5 l/ha (full tillering)	50.0	2.4	2.5
	Chlormequat-chloride 1.5 l/ha (first internode)	50.1	2.4	2.7
	Tava 0.75 l/ha (first internode)	50.1	2.5	2.6
	Tava 0.75 l/ha (flag leaf)	50.0	2.4	2.7

Notes. * *Sheriff* herbicide (20 g/ha) at the beginning of tillering stage; *Paracelsus* fungicide (0.5 l/ha) at the first internode; *Presto* insecticide (0.4 l/ha) at the heading stage;

** Tank mixture of *Primus* herbicide (0.5 l/ha), *Dot* fungicide (0.5 l/ha) and *Presto* insecticide (0.4 l/ha) at the second internode.

variants at this stage can be explained by the fact that growth inhibitors should begin to be used from the full tillering stage according to the regulations.

The analysis of plants at full ripeness stage showed the effect of the studied preparations (Table 2).

In all variants, growth inhibitors reduced plant height. Spraying the plants with Chlormequat-chloride in the tillering stage resulted in a decrease in plant height by 6.8 cm (Protection System 1) and 7.2 cm (Protection System 2) compared to the control. At the first internode stage, spraying the crops with the same inhibitor allowed us to obtain the lowest plant height in the experiment – 110.5 cm (Protection System 1) and 110.3 cm (Protection System 2).

Application of Tava at the flag leaf stage was more effective, as it reduced plant height by 11.3 cm (Protection System 1) and 11.9 cm (Protection System 2) compared to the control, and spraying plants with this formulation at the first internode reduced plant height by 8.3 cm (Protection System 1) and 9.5 cm (Protection System 2) compared to the control.

It means that, regardless of the formulation and the stage of its application, growth inhibitors contributed to the reduction of Khorasan wheat plant height.

The research also established the effect of the studied formulations on the coefficients of

general and productive tillering of Khorasan wheat plants. The application of Chlormequat chloride reduced the coefficient of general tillering compared to the control by 0.22 in the protection system 1 (at spraying in the tillering stage) and by 0.26 (at the first internode); in the protection system 2 – by 0.13 (at spraying in the tillering stage) and by 0.15 (at the first internode). However, this growth inhibitor increased the coefficient of productive tillering, which was higher than the control in the protection system 1 by 0.27 (at spraying at the tillering stage) and 0.22 (at the first internode), and in the protection system 2 – by 0.32 (at the tillering stage) and 0.19 (at the first internode).

Spraying with Tava at the first internode of wheat plants contributed to a significant increase in the general tillering coefficient compared to the control (+0.22 – protection system 1; +0.15 – protection system 2) and the productive tillering coefficient (+0.35 – protection system 1; +0.48 – protection system 2).

The highest rate of total tillering was obtained by applying this formulation at the flag leaf stage, which exceeded the control by 0.35 (protection system 1) and by 0.27 (protection system 2). However, the coefficient of productive tillering significantly decreased compared to the treatment at the first internode stage – 0.21 (protection system 1) and 0.22 (protection system 2), although this indicator increased by

Table 2. Biometric parameters of Khorasan wheat plants in the full ripeness stage, 2022–2024

Protection system	Application of growth inhibitor	Height, cm	Total number of stems, pcs/m ²	Number of productive stems, pcs/m ²	Coefficient of	
					general tillering	productive tillering
Protection system 1*	Control	123.2	823	823	2.06	1.05
	Chlormequat-chloride 1.5 l/ha (full tillering)	116.4	735	525	1.84	1.32
	Chlormequat-chloride 1.5 l/ha (first internode)	110.5	718	508	1.80	1.27
	Tava 0.75 l/ha (first internode)	114.9	910	560	2.28	1.40
	Tava 0.75 l/ha (flag leaf)	111.9	963	473	2.41	1.19
Protection system 2**	Control	124.0	825	421	2.04	1.05
	Chlormequat-chloride 1.5 l/ha (full tillering)	116.8	740	515	1.91	1.37
	Chlormequat-chloride 1.5 l/ha (first internode)	110.3	718	510	1.89	1.24
	Tava 0.75 l/ha (first internode)	114.5	896	563	2.19	1.53
	Tava 0.75 l/ha (flag leaf)	112.1	923	444	2.31	1.31

Notes. * *Sheriff* herbicide (20 g/ha) at the beginning of tillering stage; *Paracelsus* fungicide (0.5 l/ha) at the first internode; *Presto* insecticide (0.4 l/ha) at the heading stage;

** Tank mixture of *Primus* herbicide (0.5 l/ha), *Dot* fungicide (0.5 l/ha) and *Presto* insecticide (0.4 l/ha) at the second internode.

0.14 (protection system 1) and 0.26 (protection system 2) compared to the control.

The amount of chlorophyll in plant leaves demonstrates the state of plants during the stages of organogenesis. The measurement of chlorophyll content in the tillering stage showed no difference between the experimental variants. First of all, this is explained by the fact that the application of the formulations according to the experimental design started from this stage, so no effect on this indicator was recorded (Table 3).

Analysis of the plant samples at the end of the stem elongation stage showed that the application of growth inhibitors increased the chlorophyll content in the leaves compared to the control. The highest rates were obtained in the variants with Chlormequat chloride in the tillering stage: 7.2 mg/g (protection system 1) and 7.1 mg/g (protection system 2). The better plant health under the use of growth inhibitors in protection system 1 is explained by the effect of *Paracelsus* fungicide, which was used at the first

internode.

The study of the chlorophyll content in Khorasan wheat leaves in the heading stage demonstrates the effect of not only growth regulators, but also the fungicide that was part of the protection systems. Thus, in the protection system 2, where *Dot* fungicide was used later (at the second internode), the chlorophyll content was 0.1–0.2 mg/g higher than in the protection system 1.

In all variants of application, growth regulators contributed to the preservation of chlorophyll content by 0.3–0.4 mg/g higher than in the control, depending on the protection system.

Plant productivity depends on many factors. One of the most important is their state during different stages of organogenesis. Accumulation of nutrients by plants in vegetative organs allows prolonging the vegetation of plants and the period of transfer of these substances to the head of grain, forming productivity indicators (Table 4).

Studies have shown that there was a de-

Table 3. Chlorophyll content (mg/g) in leaves of Khorasan wheat plants of Sarmat variety depending on the protection system and the application of growth inhibitor (average for 2022–2024)

Protection system	Application of growth inhibitor	Chlorophyll content in leaves (mg/g)		
		tillering	stem elongation	heading
Protection system 1*	Control	7.2	6.8	6.2
	Chlormequat-chloride 1.5 l/ha (full tillering)	7.3	7.2	6.5
	Chlormequat-chloride 1.5 l/ha (first internode)	7.2	7.0	6.5
	Tava 0.75 l/ha (first internode)	7.3	7.0	6.5
	Tava 0.75 l/ha (flag leaf)	7.0	6.9	6.5
Protection system 2**	Control	7.2	6.8	6.2
	Chlormequat-chloride 1.5 l/ha (full tillering)	7.3	7.1	6.6
	Chlormequat-chloride 1.5 l/ha (first internode)	7.3	7.0	6.6
	Tava 0.75 l/ha (first internode)	7.2	7.0	6.6
	Tava 0.75 l/ha (flag leaf)	7.2	6.9	6.6

Notes. * Sheriff herbicide (20 g/ha) at the beginning of tillering stage; Paracelsus fungicide (0.5 l/ha) at the first internode; Presto insecticide (0.4 l/ha) at the heading stage;
** Tank mixture of Primus herbicide (0.5 l/ha), Dot fungicide (0.5 l/ha) and Presto insecticide (0.4 l/ha) at the second internode.

Table 4. Indicators of yield attributes of Khorasan wheat, 2022–2024

Protection system	Application of growth inhibitor	Spike length, cm	Grain weight per spike, g	Number of grains per spike, pcs.	1000 grains weight, g
Protection system 1*	Control	6.0	1.060	21	50.52
	Chlormequat-chloride 1.5 l/ha (full tillering)	5.9	1.247	23	54.22
	Chlormequat-chloride 1.5 l/ha (first internode)	5.6	1.237	23	58.92
	Tava 0.75 l/ha (first internode)	6.4	1.379	25	57.44
	Tava 0.75 l/ha (flag leaf)	6.4	1.145	25	54.51
Protection system 2**	Control	5.9	1.014	20	50.72
	Chlormequat-chloride 1.5 l/ha (full tillering)	5.9	1.303	24	54.30
	Chlormequat-chloride 1.5 l/ha (first internode)	5.8	1.354	23	58.85
	Tava 0.75 l/ha (first internode)	6.4	1.387	24	57.81
	Tava 0.75 l/ha (flag leaf)	6.4	1.265	23	55.01

Notes. * Sheriff herbicide (20 g/ha) at the beginning of tillering stage; Paracelsus fungicide (0.5 l/ha) at the first internode; Presto insecticide (0.4 l/ha) at the heading stage;
** Tank mixture of Primus herbicide (0.5 l/ha), Dot fungicide (0.5 l/ha) and Presto insecticide (0.4 l/ha) at the second internode.

crease in the spike length by 0.1 cm when using the growth inhibitor Chlormequat-chloride in the tillering stage and by 0.4 cm in the first internode stage in variants with the use of protection system 1 compared to the control. When crops were sprayed with the growth inhibitor

Tava, the spike length of Khorasan wheat increased by 0.4 cm compared to the control. A similar tendency of growth regulators impact on the spike length was observed in the protection system 2. Thus, Chlormequat-chloride did not contribute to the increase of this indicator, while

Tava increased it by 0.5 cm.

The number of grains per spike differed between variants and between protection systems. Thus, the protection system 1 recorded the highest number of grains per spike (25.0 grains), which is 1.0 more than in the variants with the other protection system. This is primarily associated with the prolonged effect of the insecticide, which ensured the safety of grains from the *Anisoplia austriaca* Hrbst.

Comparing the effect and period of application of growth inhibitors, it was found that these formulations contributed to increasing the number of grains per spike compared to the control. Chlormequat-chloride, regardless of the variant, contributed to an increase in this indicator by 2.0 units, Tava – by 4.0 units in the first protection system. The application of tank pesticide

mixture at the second internode stage with spraying of crops with growth inhibitors also increased the number of grains per spike by 3.0–4.0 grains compared to the control.

Regardless of the protection system in all variants, the application of growth inhibitors contributed to an increase in the 1000 grain weight compared to the control. The most significant increase in the 1000 grain weight was obtained by spraying the crops with Chlormequat-chloride at the first internode stage, where this increase was 8.4 g (protection system 1) and 8.1 g (protection system 2) compared to the control. Thus, spraying crops with growth inhibitors helps to control the plant height of Khorasan wheat, thereby forming better productivity indicators, which are directly responsible for grain yield (Table 5).

Table 5. Grain yield of Khorasan wheat of Sarmat variety depending on the cultivation technology elements, 2022–2024

Protection system	Application of growth inhibitor	Yield, t/ha	Increase in yield	
			t/ha	%
Protection system 1*	Control	1.8	-	-
	Chlormequat-chloride 1.5 l/ha (full tillering)	3.6	1.8	100.0
	Chlormequat-chloride 1.5 l/ha (first internode)	3.2	1.4	77.7
	Tava 0.75 l/ha (first internode)	3.8	2.0	111.1
	Tava 0.75 l/ha (flag leaf)	3.3	1.5	83.3
Protection system 2**	Control	1.6	-	-
	Chlormequat-chloride 1.5 l/ha (full tillering)	3.3	1.7	106.3
	Chlormequat-chloride 1.5 l/ha (first internode)	2.8	1.2	75.0
	Tava 0.75 l/ha (first internode)	3.2	1.6	100.0
	Tava 0.75 l/ha (flag leaf)	2.9	1.3	81.3

Notes. * Sheriff herbicide (20 g/ha) at the beginning of tillering stage; Paracelsus fungicide (0.5 l/ha) at the first internode; Presto insecticide (0.4 l/ha) at the heading stage;

** Tank mixture of Primus herbicide (0.5 l/ha), Dot fungicide (0.5 l/ha) and Presto insecticide (0.4 l/ha) at the second internode.

The dependence of Khorasan wheat grain yield on the protection systems was also observed.

The first protection system contributed to the formation of the highest yields, depending on the variant of the experiment. Spraying the crops with Chlormequat-chloride at the first internode stage increased the yield by 1.4 t/ha compared to the control, and the application of this growth inhibitor in the tillering stage increased it by 1.8 t/ha. The highest yield level in the experiment was ob-

tained by spraying the crops with Tava at the first internode stage (+2.0 t/ha to the control), while its application at the second internode stage provided an increase of 1.5 t/ha.

In the second protection system, the highest increases in grain yield were obtained by spraying the plants with Chlormequat-chloride in the tillering stage (+1.7 t/ha compared to the control) and by spraying the crops at the first internode stage with Tava (+1.6 t/ha compared to the control).

Thus, research has established the expediency of applying growth inhibitors in growing Khorasan wheat, which not only ensured the lodging resistance of plants, but also contributed to the formation of better productivity indicators in the eastern part of the Northern Steppe of Ukraine.

Conclusions. The results of the analysis of plant samples in the full ripeness stage allow us to conclude that a decrease in plant height due to the application of growth inhibitors was observed in all variants of the experiment. The application of Chlormequat chloride at the first internode stage resulted in the lowest plant height in the experiment – 110.5 cm (Protection System 1) and 110.3 cm (Protection System 2). Tava was more effective when applied at the flag leaf stage, reducing plant height by 11.3 cm (111.9 cm) compared to the control under protection system 1. In all variants with growth inhibitors application, the chlorophyll content was 0.3–0.4 mg/g higher than in the control, depending on the protection system.

It was found that growth inhibitors and the

application period influenced the increase in the number of grains per spike compared to the control. Regardless of the experimental variants, spraying with Chlormequat-chloride contributed to an increase in this indicator by 2.0 grains, Tava – by 4.0 grains under protection system 1. When using tank-mixed pesticides at the second internode stage, the number of grains per spike also increased by 3.0–4.0 grains when spraying crops with growth inhibitors compared to the control.

The first protection system contributed to the formation of the highest yields depending on the variant of the experiment. Spraying the crops with Chlormequat chloride at the first internode stage provided an increase in grain yield of 1.4 t/ha compared to the control, and the application of this growth inhibitor in the tillering stage – 1.8 t/ha. The highest yields in the experiment were obtained by spraying the crops with Tava at the first internode stage (+2.0 t/ha compared to the control), while its application at the second internode stage provided a yield increase of 1.5 t/ha.

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Бутенко О. М., Вінюков О. О., Бондарева О. Б., Ліхущина Г. А. Вплив регуляторів росту та пестицидів на формування продуктивності пшениці туранської (*Triticum turanicum* Jakubz.) в умовах східної частини Північного Степу України. *Зернові культури*. 2024. 8 (2). 255–263.

Донецька державна сільськогосподарська дослідна станція НААН, вул. Захисників України, 1, м. Покровськ, Донецька область, 85307, Україна

Актуальність. Пшениця тверда має велике значення через відмінні якісні властивості, які дозволяють забезпечити населення високоякісними продуктами харчування. Вид *Triticum turanicum* Jakubz, генетично близький до пшениці твердої, потребує масового поширення. **Для вирішення цієї проблеми** потрібне вивчення агротехнологічних прийомів вирощування пшениці туранської, які б сприяли формуванню рослинами високої продуктивності, у тому числі використання інгібіторів росту та пестицидів. **Мета досліджень.** Встановити вплив інгібіторів росту та систем захисту на ріст та розвиток рослин пшениці туранської (*Triticum turanicum* Jakubz.) в умовах східної частини Північного Степу України. **Матеріали і методи.** Дослідження проводились у 2022–2024 рр. Донецькою державною сільськогосподарською дослідною станцією НААН за методикою польової справи Б. О. Доспехова. Для сівби використовували сорт пшениці туранської Сармат. Досліджували два інгібітори росту: Хлормекват-хлорид та Тава, якими обприскували рослини у різні фази розвитку. Система захисту рослин передбачала два варіанти: Система захисту 1 – гербіцид Шериф (20 г/га, початок кущіння); фунгіцид Парацельс (0,5 л/га, перше міжвузля); інсектицид Престо (0,4 л/га, колосіння); Система захисту 2 - бакова суміш препаратів Примус (0,5 л/га, гербіцид), Дот (0,5 л/га, фунгіцид) та Престо (0,4 л/га, інсектицид) друге міжвузля. Методи дослідження: польовий, лабораторний, математично-статистичний. **Результати.** Аналіз рослин у фазі повної стиглості виявив, що використання Хлормекват-хлориду на етапі першого міжвузля дозволило отримати найменшу висоту рослин у досліді –

110,5 см (Система захисту 1) та 110,3 см (Система захисту 2). Встановлено, що інгібітори росту та строк їх застосування впливали на збільшення кількості зерен у колосі порівняно з контролем на 3,0–4,0 шт. Обприскування посівів Хлормекват-хлоридом на етапі першого міжвузля забезпечило прибавку порівняно з контролем 1,4 т/га, а застосування цього інгібітора росту у фазу куціння – 1,8 т/га. Найвищий рівень врожайності у досліді був отриманий при обприскуванні посівів препаратом Тава на етапі першого міжвузля (+2,0 т/га порівняно з контролем), в той час, як його використання на етапі другого міжвузля забезпечило прибавку на рівні 1,5 т/га. **Висновки.** Встановлена доцільність застосування інгібіторів росту разом з пестицидами при вирощуванні пшениці туранської, це не тільки забезпечувало стійкість рослин до вилягання, а й сприяло формуванню кращих показників їх продуктивності в умовах східної частини Північного Степу України.

Ключові слова: пшениця туранська, етапи органогенезу, інгібітори росту, система захисту рослин, біометричні показники, показники структури урожаю, урожайність