



Biological Effectiveness of Chemical Preparations used Against Fungal Yellow Rust and Powdery Mildew Disease of Wheat

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Annotation: The article describes the effects of fungicides and suspensions on the plant, changes in the development of the disease, and yellow rust of the used fungicides and suspensions using effective methods of protection against fungal diseases of soft winter wheat. and biological efficiency of powdery mildew disease Duazol, 40% k.e.c. 0.25 l/ga (etalon)+IFO PZN 2.0-3.0 l/ga variant averaged from 85.2% to 87.9%, to etalon compared to Rauma 490 k.e.1.25 l/ga+IFO PZN 2.0-3.0 l/ga and AZOTE 320 SC, 32% K.C 0.3-0.4 l/ga+ IFO PZN 2.0-3.0 On average, it was found that the variants applied to l/ga had a high positive effect from 98.1% to 99.3%.

Keywords: wheat, yellow rust, powdery mildew, chemical control, fungicide, suspension, experiment, control, etalon, research, methodology, chlorophyll, object, fungus, productivity, biological efficiency.

The world's leading wheat producers are India with 30 million hectares, Russia with 27 million hectares, Spain with 26 million hectares, China with 24 million hectares, and the United States with 15 million hectares. In particular, China, India, and Russia account for 46 percent of wheat production. Nowadays, yellow rust and powdery mildew diseases of wheat have been proven to seriously affect grain yield in all grain-growing countries. 20-25% of yield is lost due to wheat yellow rust, and brown rust, and 15-20% due to powdery mildew.

It is desirable to use effective methods against fungal diseases found in grain fields of our republic. One of the best measures is to first plant disease-resistant varieties and prevent the spread of diseases. Chemical control of diseases in grain crops begins when 5-20% are affected, depending on the level of disease. Preventive chemical control against rust diseases before the spread of rust diseases is carried out in areas prone to rust diseases prevents the spread of epiphytotic of rust diseases and preserves grain productivity.

DRUNK 300 EC 0.3 l/ga fungicide used in the chemical control of yellow rust disease in the irrigated grain fields of the Andijan region is a control option and the biological efficiency is 85.4% compared to other options, and the yield is 8.4 s/ga it became known that it increased [4]. Abakus Ultra fungicide at a rate of 1-1.5 l/ga inhibited the development of 93.7-96.3% of rust-causing spores during chemical control of rust diseases in winter wheat fields. and the biological efficiency was 87-89% [5]. One of the most effective ways to protect plants from fungal diseases is the creation of resistant varieties, high biological efficiency, and ecologically effective methods [6].

With the use of propiconazole + tebuconazole active substance preparations for fungal diseases, with OVX and a boom sprayer, the consumption of the drug is 0.2-0.3 liters per 1 hectare, and the average consumption is 0.4-0.6 liters per 600 liters of water. Applying it to an area of 2 hectares gives a good result [7]. The use of mineral fertilizers (potassium-amorphous) with a solution



"Suspension" is considered an effective method to protect grain crops from rust disease, "Alto Super" fungicide at the rate of 0.3 l/ga together with a suspension of 200- Dissolving it in 300 liters of water and spraying it is an effective method [8]. The degree of damage to each leaf of the plants was calculated according to the Peterson scale for brown rust and the Manners scale for yellow rust out of 10, taking into account the diseases of the plant stem, in the options where chemical control was carried out, the crop was kept until full. remaining [9].

Altazol KE, Adeksar KE, and Zantara KE drugs were used in chemical treatment against yellow rust disease in winter wheat fields. Among them, the highest efficiency from the biological and economic point of view was observed when the Adexar KE fungicide was used at the consumption rate of 1.4 l/ga, compared to the Altazol KE and Zantara KE drugs, it's biological efficiency was 99.2%, and the yield increased by 3.4 s/ga [10]. Yellow rust disease of wheat causes 70-100% damage to the plant during the entire growing season, resulting in 40-60% yield loss and reduced germination energy due to the destruction of seeds due to the disease [11]. The annual loss of wheat rust disease is 5-17%, and in epiphytotic years, this indicator leads to 45-70% damage per year [12]. The initial symptoms of powdery mildew are white powder on the leaves of lawns, then cottony spots are formed, and the disease develops and spreads very quickly when the relative humidity of the air is 90-99% and the air temperature is 15-20 °C [13].

As a result of repeated use of the same fungicide for yellow and powdery mildew diseases in wheat, fungi begin to develop immunity against them [14]. The only reliable way to protect wheat from rust diseases is to treat it with fungicides, fungicides can stop the development of rust for 25-30 days, but if the disease spreads strongly or if spot diseases occur along with rust in the field, the weather taking into account the temperature, the second treatment should be done 15-20 days after the first treatment and the third treatment after the same time [15].

Research methods. Conducting field experiments, phenological observation, harvest and counting, and laboratory analyses in "Generally accepted methods", distribution of wheat yellow and powdery mildew diseases Chumakov, 1974; Murat Koishibayev 2002; B. Hasanov carried out research in 2013 and determined yellow rust damage in field conditions (Manners, 1950) and powdery mildew damage (Hasanov, 2013 (%)) scale [1; 2; 3].

Research results. The biological effectiveness of fungicides is mainly determined by two indicators: the spread of diseases and their intensive development (level of damage).

According to the results of the conducted scientific research, the development of yellow rust (*Puccinia striiformis*) and wheat dew (*Erysiphe graminis.f.sptritici*) diseases in winter wheat variety "Kesh-2016" taken as an object and Duazol, 40% (k.e.k) 0.25 l/ga (standard), Bi-Kanazol 400 g/l 0.2-0.3 l/ga, AZOTE 320 SC, 32% K.C 0.3-0.4 l/ga, Rauma 490 c.e. Treatment with 1.25 l/ga, Alta Super 40% 0.3 l/ga, Altus Duo 32.5% 0.3 l/ga fungicides, and recommendation for the selective production of the most effective fungicide experiments were conducted for

According to the results of the fight against yellow rust (*Puccinia striiformis*) in variants with fungicide + suspension according to the same parameters, when the number of plants per 1 m² was determined, in the control (untreated) variant, on average 399, was 6 units, the average number of infected plants was 154.4 units per 1 m². As a percentage, it was found that the average incidence was 9.5% in three years.

Duazol, 40% (k.e.c.) 0.25 l/ga (standard) + in the variant where the suspension drug was used, the number of plants was 398.4 units per 1 m², the number of infected plants was 137.9 units per 1 m² on average in percentage terms, it was 34.0% on average in three years, and the average morbidity rate was 8.5%.



The best indicators compared to the control and benchmark are AZOTE 320 SC, 32% K.C 0.3-0.4 l/ga +suspension. The number of plants per 1 m² is on average 400.2 units, the number of infected plants per 1 m² average 122.0 units, the average percentage is 30.3%, the average incidence rate is 7.6%, Rauma 490 k.e. In the option where 1.25 l/ga fungicide+suspension was applied, the number of plants per 1 m² was 398.7 on average, the number of infected plants was 125.0 per 1 m², the average percentage was 30.9%, the average incidence rate was 7.7% in studies.

Development of fungal diseases in soft wheat variety Kesh-2016 with fungicide + suspension (Shahrisabz 2020-2022) Table 1.

Type of disease	Experience options	Number of plants, units per 1 m ²	The number of infected plants, units per 1m ²	%	Average incidence rate, %
		average	average	average	average
Yellow rust, (<i>Puccinia striiformis</i>)	Control (Untreated)	399,6	154,4	37,8	9,5
	Duazol, 40% k.e.c 0.25 l/ga (standard)+IFO PZN 2.0-3.0 l/ga	398,4	137,9	34	8,5
	Bi-Kanazol 400 g/l 0.2-0.3 l/ga+IFO PZN 2.0-3.0 l/ga	398,3	134,9	33,5	8,4
	AZOTE 320 SC, 32% K.S 0.3-0.4 l/ga+ IFO PZN 2.0-3.0 l/ga	400,2	122	30,3	7,6
	Rauma 490 k.e.1.25 l/ga+IFO PZN 2.0-3.0 l/ga	398,7	125	30,9	7,7
	Alta Super 40% 0.3 l/ga+ IFO PZN 2.0-3.0 l/ga	399,4	138,8	34,6	8,7
	Altus Duo 32.5% 0.3 l/ga+IFO PZN 2.0-3.0 l/ga	398,6	139,1	34,5	8,7
Wheatgrass (<i>Erysiphe graminis f.sp tritici</i>)	Control (Untreated)	396	154,5	38,1	9,6
	Duazol, 40% k.e.c 0.25 l/ga (standard)+IFO PZN 2.0-3.0 l/ga	394,9	140,1	34,3	8,7
	Bi-Kanazol 400 g/l 0.2-0.3 l/ga+IFO PZN 2.0-3.0 l/ga	393,8	142,8	35,3	9
	AZOTE 320 SC, 32% K.S 0.3-0.4 l/ga+IFO PZN 2.0-3.0 l/ga	398,1	126,2	30,6	7,7
	Rauma 490 k.e.1.25 l/ga+IFO PZN 2.0-3.0 l/ga	396,6	125,3	31	7,8
	Alta Super 40% 0.3 l/ga+ IFO PZN 2.0-3.0 l/ga	395,8	140,3	34,7	8,8
	Altus Duo 32.5% 0.3 l/ga+IFO PZN 2.0-3.0 l/ga	389,3	137,6	34,6	8,9

When fungicide+suspension is used to fight against the disease of powdery mildew (*Erysiphe graminis. f.sp. tritici*), the number of plants in the Control (untreated) variant is 396.0 plants per 1 m² on average, and the number of infected plants is 154.5 plants per 1 m² on average reached, the average percentage was 38.1%, and the average incidence rate was 9.6%. Duazol, 40% (k.e.c.) 0.25



l/ga (standard) + suspension drug was used in the variant where the number of plants was 394.9 units per 1 m², the number of infected plants was 140.1 units per 1 m² on average, the percentage in three years, the average rate was 34.3%, the average rate of morbidity was 8.7%.

Development of fungal diseases after 7 days in the fungicide+suspension variant of Kesh-2016 variety of soft wheat (Shahrisabz 2020-2022) Table 2.

Type of disease	Experience options	Number of infected plants, units after 7 days	%	Average incidence rate, %	Biological efficiency, %
		average	average	average	average
<i>Yellow rust, (Puccinia striiformis)</i>	Control (Untreated)	197,3	49,2	12,3	-29,7
	Duazol, 40% k.e.c 0.25 l/ga (standard)+IFO PZN 2.0-3.0 l/ga	33	8,3	2,1	75,7
	Bi-Kanazol 400 g/l 0.2-0.3 l/ga+IFO PZN 2.0-3.0 l/ga	27,8	7	1,8	79,1
	AZOTE 320 SC, 32% K.S 0.3-0.4 l/ga+ IFO PZN 2.0-3.0 l/ga	16,6	4,2	1	86,3
	Rauma 490 k.e.1.25 l/ga+IFO PZN 2.0-3.0 l/ga	13,2	3,3	0,8	89,3
	Alta Super 40% 0.3 l/ga+ IFO PZN 2.0-3.0 l/ga	31,9	8	2	76,9
	Altus Duo 32.5% 0.3 l/ga+IFO PZN 2.0-3.0 l/ga	29,9	7,5	1,9	78,3
<i>Wheatgrass (Erysiphe graminis f.sp tritici)</i>	Control (Untreated)	169,4	42,7	10,8	-12
	Duazol, 40% k.e.c 0.25 l/ga (standard)+IFO PZN 2.0-3.0 l/ga	30,4	7,7	1,9	77,6
	Bi-Kanazol 400 g/l 0.2-0.3 l/ga+IFO PZN 2.0-3.0 l/ga	24,8	6,3	1,6	82,1
	AZOTE 320 SC, 32% K.S 0.3-0.4 l/ga+IFO PZN 2.0-3.0 l/ga	11,6	2,9	0,7	90,5
	Rauma 490 k.e.1.25 l/ga+IFO PZN 2.0-3.0 l/ga	10,5	2,7	0,7	91,4
	Alta Super 40% 0.3 l/ga+ IFO PZN 2.0-3.0 l/ga	14,7	3,7	0,9	89,3
	Altus Duo 32.5% 0.3 l/ga+IFO PZN 2.0-3.0 l/ga	13,7	3,5	0,9	89,8

The best results were determined in the variant where AZOTE 320 SC, 32% K.C. 0.3-0.4 l/ga+suspension was applied, the number of plants per 1 m² was on average 398.1 units, the number of infected plants per 1 m² on average 126.2 units, average percentage 30.6%, average morbidity was 7.7%, Rauma 490 k.e. In the case where 1.25 l/ga fungicide+suspension was used, the number of plants per 1 m² was 396.6 on average, and the number of infected plants was 125.3 on 1 m². it was noted that the average percentage is 31.0%, and the average incidence rate is 7.8%.



According to the results of the fight against yellow rust (*Puccinia striiformis*) in variants with fungicide + suspension, after 7 days, when the number of infected plants per 1 m² was determined, in the control (untreated) variant, the average number was 197.3 if it was organized, if we consider it as a percentage, it was determined that it was 49.2% on average in three years. It was observed that the mean morbidity rate was 12.3% and the biological efficacy was -29.7%. Duazol, 40% (c.e.c.) 0.25 l/ga (standard) + suspension preparation was used, after 7 days the number of infected plants was 33.0 units per 1m², and the percentage of dead in three years it was determined that the average is 8.3%. It was observed that the average morbidity rate was 2.1%, and the biological efficiency was 75.7%.

The best indicators compared to the control and standard are AZOTE 320 SC, 32% K.C. 0.3-0.4 l/ga + the number of infected plants per 1 m² in the variant with suspension is on average 16.6 units, as a percentage average 4.2%, average morbidity was 1.0%, biological efficiency was observed to be 86.3%. Rauma 490 c.e. In the option where 1.25 l/ga fungicide+suspension was used, the average number of infected plants per 1 m² was 13.2 units, the average percentage was 3.3%, the average disease rate was 0.8% it was noted that the biological efficiency was 89.3%.

When fungicide+suspension was used to fight against powdery mildew (*Erysiphe graminis* f. *tritici*), in the control (untreated) option, the number of infected plants was 169.4 units per 1 m² on average, while the percentage of dead average was 42.7%, the average incidence was 10.8%, and the biological efficiency was -12.0%. Duazol, 40% (k.e.c.) 0.25 l/ga (standard) + suspension preparation was used, and after 7 days the number of infected plants was 30.4 units per 1 m², and in percentage terms, in three years o It was found that the average is 7.7%. It was observed that the average morbidity rate was 1.9%, and the biological efficiency was 77.6%.

The best results were obtained in the variant where AZOTE 320 SC, 32% K.C. 0.3-0.4 l/ga+suspension was applied, the average number of infected plants was 11.6 per 1 m², the average percentage was 2.9%, the average morbidity rate was 0.7%, and the biological efficiency was found to be 90.5%.

Development of fungal diseases after 14 days in the fungicide+suspension variant of Kesh-2016 variety of soft wheat (Shahrisabz 2020-2022) Table 3.

Type of disease	Experience options	Number of infected plants, units after 14 days	%	Average incidence rate, %	Biological efficiency, %
		average	average	average	average
<i>Yellow rust, (Puccinia striiformis)</i>	Control (Untreated)	187,4	46,9	11,7	-17,6
	Duazol, 40% k.e.c 0.25 l/ga (standard)+IFO PZN 2.0-3.0 l/ga	24,1	6,1	1,5	83,1
	Bi-Kanazol 400 g/l 0.2-0.3 l/ga+IFO PZN 2.0-3.0 l/ga	24,2	6,1	1,5	82,8
	AZOTE 320 SC, 32% K.S 0.3-0.4 l/ga+ IFO PZN 2.0-3.0 l/ga	3,1	0,8	0,2	97,5
	Rauma 490 k.e.1.25 l/ga+IFO PZN 2.0-3.0 l/ga	3,4	0,9	0,2	97,4
	Alta Super 40% 0.3 l/ga+ IFO PZN 2.0-3.0 l/ga	17,4	4,3	1,1	87,9



	Altus Duo 32.5% 0.3 l/ga+IFO PZN 2.0-3.0 l/ga	18,3	4,6	1,2	87,3
Wheatgrass (Erysiphe graminis f.sp tritici)	Control (Untreated)	185,5	47,1	12	-29,9
	Duazol, 40% k.e.c 0.25 l/ga (standard)+IFO PZN 2.0-3.0 l/ga	20,4	5,2	1,3	85,3
	Bi-Kanazol 400 g/l 0.2-0.3 l/ga+IFO PZN 2.0-3.0 l/ga	19,1	4,9	1,2	86,3
	AZOTE 320 SC, 32% K.S 0.3-0.4 l/ga+IFO PZN 2.0-3.0 l/ga	4,6	1,1	0,3	96,5
	Rauma 490 k.e.1.25 l/ga+IFO PZN 2.0-3.0 l/ga	5,4	1,4	0,3	95,7
	Alta Super 40% 0.3 l/ga+ IFO PZN 2.0-3.0 l/ga	16,4	4,1	1	88,3
	Altus Duo 32.5% 0.3 l/ga+IFO PZN 2.0-3.0 l/ga	15	3,9	1	88,4

Rauma 490 c.e. In the option where 1.25 l/ga fungicide+suspension was applied, the number of infected plants was 10.5 plants per 1 m² on average, and the percentage was 2.7% on average, the average disease rate 0.7%, the biological efficiency was observed to be 91.4%.

According to the results of the fight against yellow rust (*Puccinia striiformis*) in variants with fungicide + suspension, after 14 days, when the number of infected plants per 1 m² was determined, in the control (untreated) variant, the average number was 187.4 if it was organized, if we consider it as a percentage, it was determined that it was 46.9% on average in three years. It was observed that the mean morbidity rate was 11.7% and the biological efficacy was -17.6%. Duazol, 40% (k.e.k.) 0.25 l/ga (standard) + suspension preparation was used, and the number of infected plants after 14 days was 24.1 plants per 1 m², and in percentage terms, in three years o It was found that the average is 6.1%. It was observed that the average morbidity rate was 1.5%, and the biological efficiency was 83.1%.

The best indicators compared to the control and standard are AZOTE 320 SC, 32% K.C. 0.3-0.4 l/ga +sus, the number of infected plants on average is 3.1 plants per 1 m², as a percentage average of 0.8%, average morbidity was 0.2%, biological efficiency was observed to be 97.5%. Rauma 490 c.e. In the option where 1.25 l/ga fungicide+suspension was used, the number of infected plants per 1 m² was on average 3.4, the average percentage was 0.9%, and the average disease rate was 0.2%. biological efficiency was 97.4%.

After 14 days when fungicide+suspension is used to fight against *Erysiphe graminis*. f.sp. tritici disease, the number of infected plants in the control (untreated) option is 185.5 units per 1 m² on average reached, the average percentage was 47.1%, the average incidence rate was 12.0%, and the biological efficiency was -29.9%. Duazol, 40% (k.e.k.) 0.25 l/ga (standard) + suspension preparation was used, and the number of infected plants after 14 days was 20.4 plants per 1 m², in percentage terms, in three years o It was found that the average is 5.2%. It was observed that the average morbidity rate was 1.3%, and the biological efficiency was 85.3%.

The best results are in the variant where AZOTE 320 SC, 32% K.C. 0.3-0.4 l/ga+suspension is applied, the number of infected plants on 1 m² is on average 4.6 units, on average 1.1 as a percentage %, the average morbidity rate was 0.3%, and the biological efficiency was found to be 96.5%.



Development of fungal diseases after 21 days in the fungicide+suspension variant of Kesh-2016 variety of soft wheat (Shahrisabz 2020-2022) Table 4.

Type of disease	Experience options	Number of infected plants, units after 21 days	%	Average incidence rate, %	Biological efficiency, %
		average	average	average	average
<i>Yellow rust, (Puccinia striiformis)</i>	Control (Untreated)	181,1	45,3	11,3	-13,6
	Duazol, 40% k.e.c 0.25 l/ga (standard)+IFO PZN 2.0-3.0 l/ga	21	5,3	1,3	85,2
	Bi-Kanazol 400 g/l 0.2-0.3 l/ga+IFO PZN 2.0-3.0 l/ga	19,3	4,9	1,2	86,3
	AZOTE 320 SC, 32% K.S 0.3-0.4 l/ga+ IFO PZN 2.0-3.0 l/ga	0,8	0,2	0,1	99,3
	Rauma 490 k.e.1.25 l/ga+IFO PZN 2.0-3.0 l/ga	1,1	0,3	0,1	99,2
	Alta Super 40% 0.3 l/ga+ IFO PZN 2.0-3.0 l/ga	19,1	4,8	1,2	86,7
	Altus Duo 32.5% 0.3 l/ga+IFO PZN 2.0-3.0 l/ga	19,8	5	1,3	86,2
<i>Wheatgrass (Erysiphe graminis f.sp tritici)</i>	Control (Untreated)	164,8	41,6	10,5	-15,5
	Duazol, 40% k.e.c 0.25 l/ga (standard)+IFO PZN 2.0-3.0 l/ga	16,8	4,3	1,1	87,9
	Bi-Kanazol 400 g/l 0.2-0.3 l/ga+IFO PZN 2.0-3.0 l/ga	15	3,8	1	89,2
	AZOTE 320 SC, 32% K.S 0.3-0.4 l/ga+IFO PZN 2.0-3.0 l/ga	2,1	0,5	0,1	98,4
	Rauma 490 k.e.1.25 l/ga+IFO PZN 2.0-3.0 l/ga	2,4	0,6	0,2	98,1
	Alta Super 40% 0.3 l/ga+ IFO PZN 2.0-3.0 l/ga	14,3	3,6	0,9	89,8
	Altus Duo 32.5% 0.3 l/ga+IFO PZN 2.0-3.0 l/ga	12,9	3,3	0,9	90,1

Rauma 490 c.e. 1.25 l/ga fungicide+suspension was applied after 14 days, the average number of infected plants was 5.4 per 1 m², and the average percentage was 1.4 %, the average morbidity was reported to be 0.3%, while the biological efficacy was observed to be 95.7%.

According to the results of the fight against yellow rust (*Puccinia striiformis*) in the fungicide+suspension variants, after 21 days, when the number of infected plants per 1 m² was counted, the control (untreated) variant had an average of 181.1 units, and if we consider it as a percentage, it was found to be 45.3% on average in three years. It was observed that the mean morbidity rate was 11.3% and the biological efficacy was -13.6%. Duazol, 40% (k.e.k.) 0.25 l/ga (standard) + suspension preparation was used, after 21 days the number of infected plants was 21.0



units per 1 m², and in percentage terms, in three years o It was found that the average is 5.3%. It was observed that the average morbidity rate was 1.3%, and the biological efficiency was 85.2%.

The best indicators compared to the control and standard are AZOTE 320 SC, 32% K.C 0.3-0.4 l/ga + suspension after 21 days, and the average number of infected plants is 0.8 per 1 m² It was observed that the percentage was 0.2% on average, the average morbidity rate was 0.1%, and the biological efficiency was 99.3%. Rauma 490 c.e. In the option where 1.25 l/ga fungicide+suspension was used, the number of infected plants after 21 days was 1.1 plants per 1 m² on average, the average percentage was 0.3%, the average rate of infection was 0,1%, biological efficiency was noted to be 99.2%.

After 21 days when fungicide+suspension was used to fight against the disease of powdery mildew (*Erysiphe graminis. f.sp.tritici*), the number of infected plants in the control (untreated) variant was 164.8 units per 1 m² on average, and the percentage in the calculation, it was found that the average rate of morbidity was 10.5%, and the biological efficiency was -15.5%. Duazol, 40% (k.e.c.) 0.25 l/ga (standard) + suspension preparation was used, after 21 days the number of infected plants was 16.8 plants per 1m², and in percentage terms, in three years o It was found that the average is 4.3%. It was observed that the average morbidity rate was 1.1%, and the biological efficiency was 87.9%.

The best results are after 21 days in the case of AZOTE 320 SC, 32% K.C 0.3-0.4 l/ga + suspension, the number of infected plants is 2.1 units per 1 m² on average, the percentage is 0.5% on average, It was found that the average morbidity rate was 0.1%, and the biological efficiency was 98.4%. Rauma 490 c.e. In the case of 1.25 l/ga fungicide+suspension, the number of infected plants was 2.4 plants per 1 m² after 21 days, and the average percentage was 0. 6%, with an average morbidity rate of 0.2%, while the biological efficacy was found to be 98.1%.

In conclusion, of the fungicides used AZOTE 320 SC, 32% K.C 0.3-0.4 l/ga + IFO PZN suspension, and Rauma 490 k.e.1.25 l/ga + IFO PZN suspension were found to be superior in comparison to other options. When used together with a suspension, it increases the amount of green chlorophyll in plant leaves and is easily absorbed into plant tissues, resulting in an improvement in the biochemical composition of cell sap. As a result, resistance to various diseases and unfavorable weather conditions of the external environment increases. Therefore, the use of these chemical preparations against yellow rust and powdery mildew diseases in grain fields ensures a high and high-quality harvest.

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