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AGROTECHNOLOGY OF ZERO TECHNOLOGY OF WINTER WHEAT ON RAINFED LANDS IN SOUTHERN KAZAKHSTAN.

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Annotation. The article presents the results of testing of different types of new system pesticides for the contamination of winter wheat varieties of vitreous type 24 in the conditions of gray soils in the south of Kazakhstan. The most effective biological and economic efficiency of the tested herbicides were binary packaging Dialen super 480 V.R. - 0,7 l/g. Topik 080, k.e - 0.4 l/ha, and the highest yield of grain in winter wheat were formed when using herbicides. In the initial stage of weeds on winter wheat crops were treated with herbicide Ballerina in the rate of consumption 0.5 l/ha. In the article was studied the influence of different types of herbicide on the reduction of contamination of winter wheat crops and their influence on wheat grain yield. The influence of different types of used herbicides was described in detail on the species composition of weeds. Their biological and economic efficiency in the conditions of rich agriculture of southern Kazakhstan.

Key words: wheat, winter crops, water-physical properties of soils, highly efficient technologies, irrigation fluctuations, irrigation regime, economic effect.

INTRODUCTION

Winter wheat in southern Kazakhstan is the main grain crop and its productivity is 1,5-2,0 times higher than that of spring crops. Therefore, the main wedge of grain crops is winter wheat, and spring in the South of Kazakhstan is cultivated as an insurance crop.

Studies on the methods of cultivation and care of winter wheat during the growing season using new generations of herbicides and their mixtures depending on the species composition of weeds were carried out at the stationary site of the Department of agriculture and crop production of the South-Western research Institute of animal husbandry and crop production. The object of research was a zoned variety of winter wheat "Vitreous 24" selection of the Kazakh research Institute of agriculture and crop production.

Studies of winter crops found that in the conditions of rain-fed agriculture in southern Kazakhstan on winter wheat crops there are more than 30 species of weeds. The most malicious and more common of them are from annuals: field peas (Pisum arbensis), black bindweed (Poligonum convolvulus), cleavers (Galium aparine), hedgehog parsley (Caucflis lappyla); from perennial root shoots: camel thorn (Alhagi camelorum), field bindweed (Convolvulus arvensis), knapweed (Acroptilon repens), knapweed pink(Acroptilon repens); of perennial rhizomatous the most widespread are: sow thistle (Sonchus arvensis), field mustard (Brassica campestris), common couch (Elytrigia repens), scutch grass (Cynodon dactylon), etc.

In recent years, the greatest damage to the harvest of winter crops brings "wild barley" (Hordeum spontaneum) - under the folk name "karakyltyk". This pernicious weed is currently with the decline in the culture of agriculture has received the greatest distribution in the southern regions of Kazakhstan. Therefore, the aim of the research is to select the most effective herbicides and their mixtures against more common types of weeds on winter wheat crops.

According to the results of research, it was revealed that the use of herbicides on crops of grain crops contributes to the purification of fields from weeds and a significant increase in productivity. To combat weeds on winter wheat crops used "Dialen super" 480 V. R. Systemic herbicide broad spectrum against annual and perennial dicotyledonous weeds supplied by the Swiss firm LLP "Syngenta Kazakhstan". Treatment of crops with herbicide

"Dialen super" 480 V. R. in the norm of 0.7 l/ha in the phase of tillering of winter wheat against the background of harrowing allowed to reduce the weed infestation of crops by the number of weeds to 96,7 % by weight by 94,8 %. The maximum effect-96,9 % and 95,3 %, respectively, was observed against the background of direct sowing with a seeder SPS -2,1, early spring harrowing and fertilizing with nitrogen fertilizers at a rate of 35 kg/ha of the active substance. It is established that on the gray-earth soils of southern Kazakhstan using herbicides of a new generation, it is possible to obtain a high effect in the fight against weeds in direct sowing of winter wheat [1].

OBJECTS AND METHODS

The results of studies have shown that a powerful factor in the conditions of poor serozem is timely early spring fertilizing with nitrogen fertilizers. Overwintered winter wheat in unfavorable conditions of the winter period requires enhanced nutrition, especially nitrogen fertilizers. In this regard, feeding them with the resumption of spring vegetation is an effective agricultural technique.

On the control variant, where winter wheat was cultivated according to the previously recommended techniques, i.e. on the background of deep autumn ploughing (25 cm), seeding was carried out a conventional grain seeder C 3-3,6 in the second half of October and in early spring was conducted in the nitrogen fertilizers N_{35} kg/ha with subsequent harrowing and treatment with the herbicide "Dialen super" 480 V. R. – 0,7 cwt/ha in the phase of tilling of winter wheat to tubings. In this scenario, agricultural technologies of winter wheat cultivation yield on average for 3 years was 20,9 cwt/ha (table 1).

According to the results of the research, it was revealed that the decisive factor in the formation of consistently high grain yields is purposeful care taking into account the biological characteristics of cultivated and weeds. It is established that it is very important to conduct consistent and timely agrotechnological care. Thus, early spring feeding on frozen thawed soil of winter crops and harrowing at physical ripeness of the soil in the tilling phase with subsequent herbicide treatment and the use of their mixture against dicotyledonous and grain weeds ("Dialen super" 480 V. R. 0,7 l/ha "Topic" 080 K. E.-0,4 l/ha) provided a fairly high grain yield, which averaged 24,6 cwt/ha fertilizing and harrowing with direct sowing provided grain yield for an average of 3 years 20,4 cwt/ha, while the recommended technology (control), it was-20,9 cwt/ha [2].

Consequently, the regulation of food and air regime and the timeliness of their qualitative implementation with the introduction of new generation herbicides ensures consistently high grain yields with direct sowing with stubble drills SZS-2,1, excluding basic and pre-sowing soil treatment, thereby significantly reducing the direct costs of winter wheat cultivation (35-40 %).

It was revealed that the treatment of winter wheat crops against cereal weeds with herbicide "Topic" 080 K. E. gave positive results in the fight against weeds: wild barley, chicken millet, bristle, bluegrass, as well as other types of cereal weeds. The yield on this variant was relatively lower compared to the variants of the experiment, where mixtures of herbicides against dicotyledonous, cereal weeds were used and on average it was 20,9 cwt/ha, although it must be said that the "Topic"

can be used in the fields with a predominant clogging with cereal weeds.

It was revealed that the treatment of winter crops in the initial stage of weed development with a new herbicide "Fighter" EDG. 15 of serous soils of southern Kazakhstan.

In the conditions of rain-fed agriculture the main limiting factor of productivity of grain crops is a lack of moisture and elements of food of plants.

The yield of winter wheat in the conditions of rain-fed is largely determined by the productive bushiness and the number of plants per unit area. In the prevailing weather and climatic conditions, the productive bushiness under traditional cultivation technology on the variant without fertilizers averaged 1,01 PCs. when applying mineral fertilizers, their value increased to 1,13 PCs. and, accordingly, the number of plants per unit area increased-158,6-224,5 PCs./m2. However, the total number of them was slightly higher on the variants with the minimization of soil treatments and direct sowing of winter wheat. This is because during deep plowing loosened the upper layers of the soil and crop depending on the terrain, the openers of grain drills S3-3,6 seed buried too deeply in loose soil contact of seeds with soil is weak. Therefore, shoots with traditional cultivation technology are not always uniform and come a little later than direct sowing.

Table 1-Biological yield of winter wheat depending on the method of cultivation (average for 3 years).

№ p/p	Method of soil treatment	Options	Grain harvest, cwt/ha
1.	Recommended technology - control	Harrowing + Feeding + Dialen super	20,9
2.	Direct sowing C3C-2,1	Feeding + Harrowing + Dialen super	20,4
3.	Direct sowing C3C-2,1	Feeding + Harrowing + Dialen super + Topic	24,6
4.	Direct sowing C3C-2,1	Feeding + Harrowing + Topic	20,9
5.	Direct sowing C3C-2,1	Feeding + Harrowing + Destroyer 15 g/ha + Epheram 0,4l/ha	22,2
$SSD_{0,5}$ = c/ha			1,91

Of course, minimizing of the soil treatment and direct seeding the above mentioned shortcomings in the sowing of winter crops is possible that positively influenced the formation of plant density of winter wheat increased productive tilling (1,01-of 1.13 EA. with minimization of soil treatment and 1.06 to 1,23 EA. when direct seeding) and increase the number of plants to elevated backgrounds food when treated with herbicide and 246,4-273,8 PCs./m2, respectively. In the experiment, the lowest indicators of the number of winter wheat plants in all methods of soil treatment and direct sowing were observed on the background without fertilizers and without herbicides (153,8-171,8 PCs/m2) [3].

One of the indicators defining productivity of cereal crops is the number of grains with 1-th spike, length of spike, weight of grains in one ear and mass of 1000 grains. Thus, the lowest number of grains from the 1st ear with all methods of soil treatment were on the background without fertilizers (the number of grains in

the ear is 26,2-22,4 PCs.). With the improvement of cultivation conditions, i.e. mineral fertilizers and herbicides, as in conventional technology of soil treatment and minimizing treatments and direct seeding increased the number of grains per spike and their length. The largest number (32,2 PCs.) and length (9,3 cm) were obtained by minimizing soil treatments against the background of $P_{30}N_{50}$ kg/ha when treated with herbicide "target" – 1,0 l/ha in the tillering phase of winter wheat, the Lowest values of the mass of 1000 grains and the mass of grains from one ear were obtained against the background of increased norms of mineral fertilizers using the above herbicide on crops, which respectively amounted to: with traditional technology - 35.07 g and 1.32 g; with presowing disking – 34,95 g and 1,3 g with direct sowing – 34,97 g and 1,35 g.

Therefore, for a uniform course of development of winter wheat and formation of stable productivity in conditions of bogara at minimization of technology of cultivation and direct sowing the decisive factor is optimization of conditions of a food and fight against a weediness of crops.

In the conditions of southern Kazakhstan, the highest yields of winter wheat 33,3 C/ha were provided with direct sowing against a background with an increased rate of mineral fertilizers $P_{30}N_{50}$ kg/ha with the use of herbicide "target" – 1,0 l/ha. Against this background of nutrition, in the variant without herbicide treatment, grain yield decreased to 26,6 C/ha.

On variants with application of mineral fertilizers in norm $P_{15}N_{35}$ kg/ha and processing with herbicide the grain yield on average for years of researches made 27,4 C/ha, on variants without herbicide these indicators decreased to 22,1 C/ha or on 5,3 C/ha less, than at application of herbicides (table 2). In the control variant, where herbicides and mineral fertilizers were not used, the yield in direct sowing during the years of research averaged 11.9 C/ha, that is, on the same level as the control variants of traditional technology and minimization of soil treatments.

RESULTS AND DISCUSSION

Quite high yields of winter wheat grain 29,6 C/ha were obtained with traditional cultivation technology against the background of increased norms of mineral fertilizers $P_{30}N_{50}$ kg/ha when treating crops with herbicide, against this background, without herbicide treatment, the yield averaged 24,6 C/ha or 5 C/ha lower than in the treated variants. Against the background of $P_{15}N_{35}$ kg/ha yield was 23,4 and 19,7 kg/ha, respectively (table 2).

Low indicators of grain yield in the same rates of application of mineral fertilizers and herbicides were obtained with pre-sowing disking, respectively, 27,8 and 22,4 C/ha; 23,2 and 17,4 C/ha.

The lowest grain yields of 13,6 and 10,3 C/ha were obtained with pre-sowing disking on a background without fertilizers and without herbicides.

Therefore, with deep processing and minimization of treatments, the upper horizons of the soil are still exposed from plant residues, which in the conditions of the South of Kazakhstan is undesirable to allow. In direct sowing, the soil surface is pulped with plant residues of previous crops, which favourably contributed to the access of atmospheric air to the root system of winter breads with a decrease in the physical evaporation of soil moisture and thereby contributed to a greater accumulation of grain yield.

The yield of winter wheat in the conditions of bogara is largely determined by the productive bushiness and the number of plants per unit area.

Revealed, no significant growth was observed in the treatment of seeds, trace mineral fertilizer "Sizam" and microbiological fertilizer "MERS" when deep plowing loosened the upper layers of the soil and crop depending on the terrain, the

openers of grain drills S 3-3,6 seed buried too deeply in loose soil contact of seeds with soil soil is weak, thereby deteriorating the uniformity of germination, respectively, affects the productive tillering, of course, in case of direct sowing above mentioned drawbacks of winter is possible, which has a positive impact on the formation of plant density of winter wheat with increased productive tillering and increase the number of plants in the fertilized soil treatment with a herbicide and 196,0 175,0 PCs/m2, respectively.

Table 2- Winter wheat yield depending on cultivation technology (average for 3 years)

Method of soil treatment	The norm of mineral fertilizer	Experience option	Biological yield on average c/ha
1.Traditional technology	1. Control without fertilizer	Control (without herbicides)	11,0
		Treatment with herbicide	15,1
	2. $P_{15}N_{35}$ kg/ha	Control (without herbicides)	19,7
		Treatment with herbicide	23,4
	3. $P_{30}N_{50}$ kg/ha	Control (without herbicides)	24,6
		Treatment with herbicide	29,6
2.Disking BDT-3,0 or BDT-7,0	1. Control without fertilizer	Control (without herbicides)	10,3
		Treatment with herbicide	13,6
	2. $P_{15}N_{35}$ kg/ha	Control (without herbicides)	17,4
		Treatment with herbicide	23,2
	3. $P_{30}N_{50}$ kg/ha	Control (without herbicides)	22,4
		Treatment with herbicide	27,8
3.Direct sowing СЗС-2,1	1. Control without fertilizer	Control (without herbicides)	11.9
		Treatment with herbicide	15,4
	2. $P_{15}N_{35}$ kg/ha	Control (without herbicides)	22,1
		Treatment with herbicide	27,4
	3. $P_{30}N_{50}$ kg/ha	Control (without herbicides)	26,6
		Treatment with herbicide	33,3
Method of soil treatment $SSD_{0,5}$ = c/ha			1,3
Treatment of crops with herbicides $SSD_{0,5}$ = c/ha			0,55
Application of mineral fertilizer $SSD_{0,5}$= c/ha			0,8

The yield of cereals is determined by the number of grains with 1-th spike, length of spike, weight of grains in one ear and mass of 1000 grains. So, the lowest number of grains from the 1st ear were on the background without herbicide (the number of grains in the ear-15,3-24,1 PCs.). With improvement of cultivation conditions, i.e. introduction of mineral, micromineral fertilizers and application of herbicides at direct sowing the quantity of grains in an ear and their length increased. The largest number (24,0 PCs.) and length (8,9 cm) were obtained by direct sowing against the background of the recommended rate of fertilizers when treated with the herbicide "Valsamin" – 1,2 l/ha in the tillering phase of winter wheat. Therefore, for a uniform course of development of winter wheat and formation of stable productivity in conditions of bogara at direct sowing the decisive factor is optimization of conditions of a food and fight against weeds [4].

Quite high yields of winter wheat on average for 3 years 22,3 C/ha were provided with direct sowing against the background of the recommended rate of miner-

al fertilizers $P_{30}N_{50}$ kg/ha when treated with herbicide "Valsamin" – 1,2 l/ha against this background, the nutrition without herbicide treatment grain yield was slightly lower – 20,1 C/ha, when applying micromineral fertilizers without herbicide treatment, the grain yield was 16,9 and 17,5 C/ha, on variants with the use of herbicides and when processing seeds with micromineral fertilizer "sizam" and microbial fertilizer "mers" yield respectively was 18,3 and 18,9 C/ha (table 3).

Table 3-Yield of winter wheat without any soil treatments depending on the background of nutrition (average for 3 years)

Experience option	Background of nutrition	Average yield c/ha
Without herbicide	1. Control without fertilizer	11,9
	2. Phosphate fertilizer P_{30}	15,7
	3. The recommended intakes $P_{30}N_{50}$	20,1
	4. Micro mineral fertilizer «Sizam»	16,9
	5. Micro bio fertilizer «MERS»	17,5
With herbicide	1. Control without fertilizer	13,0
	1. Phosphate fertilizer P_{30}	17,4
	2. The recommended intakes $P_{30}N_{50}$	22,3
	3. Micro mineral fertilizer «Sizam»	18,3
	5. Micro bio fertilizer «MERS»	18,9
Herbicide background $SSD_{0,5}$		1,75
Background of nutrition $SSD_{0,5}$		2,38

In the control option, where herbicides and mineral fertilizers were not used, the yield at direct sowing was 11,9 C/ha, when treated with herbicides without fertilizers, the grain yield was at the level of 13,0 C/ha.

Therefore, in direct sowing, the soil surface is pulped with plant residues of previous crops, which favourably contributed to the access of atmospheric air to the root system of winter crops, with a decrease in the physical evaporation of soil moisture and thereby contributed to a greater accumulation of grain yield. In addition, when direct seeding improves soil fertility improvement of the phytosanitary state of winter crops [5].

CONCLUSION

In the article the influence of different types of herbicide on the reduction of contamination of winter wheat crops and their influence on wheat grain yield is studied. The influence of different types of used herbicides on the species composition of weeds is described in detail. Their biological and economic efficiency in the conditions of rich agriculture of southern Kazakhstan.

The yield of winter wheat in the conditions of rain-fed is largely determined by the productive bushiness and the number of plants per unit area. In the prevailing weather and climatic conditions, the productive bushiness under traditional cultivation technology on the variant without fertilizers averaged 1,01 PCs. when applying mineral fertilizers, their value increased to 1,13 PCs. and, accordingly, the number of plants per unit area increased-158,6-224,5 PCs./m2.

Quite high yields of winter wheat grain 29.6 C/ha were obtained with traditional cultivation technology against the background of increased norms of mineral fertilizers $P_{30}N_{50}$ kg/ha when treating crops with herbicide, against this back-

ground, without herbicide treatment, the yield averaged 24,6 C / ha or 5 C/ha lower than in the treated variants. Against the background of $P_{15}N_{35}$ kg/ha yield was 23,4 and 19,7 kg / ha, respectively (table 2).

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ТҮЙІН

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ОҢТҮСТІК ҚАЗАҚСТАННЫҢ ТӘЛІМІ ЖЕРЛЕРІНДЕ КҮЗДІК БИДАЙДЫ НӨЛДІК ӨҢДЕУДІҢ АГРОТЕХНОЛОГИЯСЫ

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Мақалада әр түрлі гербицидтердің күздік дақылдардың арамшөптерін азайтуға және олардың бидай дәнінің өнімділігіне әсері зерттелген. Пайдаланылған гербицидтердің әр түрлі арамшөптердің түрлерінің құрамына әсері жан-жақты сипатталған. Қазақстанның оңтүстігінде тәлімді жерінде ауыл шаруашылығы жағдайында күздік бидайдың биологиялық және экономикалық тиімділігі анықталды. Мақалада Қазақстанның оңтүстігіндегі сұр топырақ жағдайында Стекловидная-24 сортты күздік дақылдарда арамшөптерге арналған жаңа жүйелік гербицидтердің әртүрлі түрлерін сынаудың нәтижелері келтірілген. Сыналған гербицидтердің биологиялық және экономикалық тиімділігі арасында бинарлық қаптаманың тиімділігі Диален Супер 480 V.R.-0,7 л/г болды. Топик 080, к.э. - 0,4 л/га, және күздік бидайдың ең көп шығымдылығы гербицидтерді қолдану арқылы құрылды. Күздік бидайдың егістігінде арамшөптердің бастапқы даму кезінде Балерина 0,5 л/га гербициді шығыс нормасында қолданылды.

Түйінді сөздер: бидай, күздік дақылдар, топырақтың су-физикалық қасиеттері, суарудың тербелісі, суару режимі, экономикалық тиімділік.

РЕЗЮМЕ

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НУЛЕВАЯ ТЕХНОЛОГИЯ ВОЗДЕЛЫВАНИЯ ОЗИМОЙ ПШЕНИЦЫ НА БОГАРНЫХ ЗЕМЛЯХ ЮЖНОГО КАЗАХСТАНА

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В статье представлены результаты влияния различных видов гербицида на снижение засоренности посевов озимой пшеницы и на урожайность зерна пшеницы. Подробно описано влияние разных видов использованных гербицидов на видовой состав сорной растительности, их биологическая и хозяйственная эффективность в условиях богарного земледелия южного Казахстана. Приведены данные испытания различных видов новых системных гербицидов на засоренность посевов озимой пшеницы сорта Стекловидная-24 в условиях сероземных почв юга Казахстана. По биологической и хозяйственной эффективности из испытанных гербицидов наиболее эффективными оказались бинарная упаковка Диален супер 480 В.Р. - 0,7 л/га, Топик 080 к.э. – 0.4 л/га и наибольшая урожайность зерна озимной пшеницы сформировалась при применении гербицидов. На начальном этапе развития сорной растительности посевы озимой пшеницы обрабатывались гербицидом Балерина в норме расхода 0,5 л/га.

Ключевые слова: пшеница, озимые культуры, водно-физические свойства почв, высокоэффективные технологии, ирригационные колебания, режим полива, экономический эффект.