

Efficiency of agrotechnical and chemical measures in control of weeds in onion (*Allium cepa L.*) fields

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Abstract. In the scientific article, in the study of the efficiency of agrotechnical and chemical control measures against weeds in the maintenance of onion (*Allium cepa L.*) seedlings in the meadow gray soils of the Samarkand province, when the soil is plowed to a depth of 30-35 cm using a two-layer tube in the fall, 18-22 cm to the soil surface (plowing) soil density decreased by 0.06-0.09 g/cm³ in the tilled 0-30 cm layer compared to the treated options. porosity increased by 1.4%. water permeability was higher by 80.2-82.4 m³. When the soil is plowed to a depth of 30-35 cm, Select 120 KE herbicide is applied at the rates of 0.5-1.0 l/ha in the maintenance of onion seedlings (3-4 ginseng period), one-year weeds are 85.2-93.9 and 84.1 by -96.7%, perennials 67.7-81.4; 69.2-83.9% destroyed. It is stated that the phytosanitary conditions of the cultivated area will be improved, and the yield of commercial onions will be 73.6-74.4 tons/ha and high quality.

1 Introduction

Onion (*Allium cepa L.*) stands as one of the most widely consumed and nutritionally rich vegetable crops globally, renowned for its abundance of essential vitamins. With cultivation spanning 4.5 million hectares worldwide, the average yield of onions reaches 19.31 tons per hectare [1]. However, considering the biological potential of onions, there exists a promising opportunity to elevate yields substantially, potentially reaching an impressive 100 tons per hectare in irrigated lands.

Despite this potential, onion cultivation faces challenges, and one significant factor contributing to reduced yields is the pervasive presence of weeds in cultivated fields [2]. The world hosts an extensive variety of over 30,000 weed species, with approximately 1,800 of them causing substantial economic losses annually. The impact is particularly pronounced in

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major agricultural crops, where more than 200 weed species engage in fierce competition, with each food and forage crop contaminated by 10 to 60 weed species [3, 4].

The detrimental effects of weeds on onion cultivation extend beyond mere competition for resources. Weeds play a significant role in nutrient absorption from the soil, exerting a particularly noteworthy influence based on their quantity. For instance, when the weed population reaches 15-50 pieces per square meter, it results in the absorption of 4.5-5 kilograms of nitrogen per hectare. Effectively managing and mitigating weed presence in onion fields become imperative not only for preserving yield potential but also for optimizing nutrient utilization and ensuring the economic viability of onion farming practices [3]. As agriculture continues to evolve, adopting effective weed control measures becomes essential to unlock the full productivity and nutritional potential of onion crops worldwide.

The impact of weed presence on nutrient absorption in agricultural fields is substantial. When the weed population ranges from 50 to 100, the absorption of essential nutrients by these unwanted plants is noteworthy. Specifically, weeds absorb approximately 1.8-2.6 kilograms of phosphorus and 5.9-6.4 kilograms of potassium per hectare. As the weed density increases to 100, these nutrient absorption figures escalate to 6.3-7.2 kilograms for phosphorus and 2.7-3.6 kilograms for potassium. Additionally, the absorption of nitrogen reaches 9.5-10.3 kilograms per hectare under these conditions [5-7].

The repercussions of such nutrient competition with weeds are reflected in the diminished yields of various cultivated crops. Studies indicate that in grain fields, crop yields decrease by 10%, while in grain legumes, the reduction is even more pronounced at 13.4%. Other crops experience negative impacts as well, with a 7.5% decrease in cotton yields, a 6% reduction in potato yields, and a 10.8% decline in vegetable crop yields [8]. These findings underscore the critical importance of effective weed control strategies to optimize nutrient availability for desirable crops and safeguard overall agricultural productivity [9].

Providing context to the scale of the weed challenge, research conducted in Russia reveals that agricultural fields harbor an astonishing average of 100 million to 3-4 billion weed seeds per hectare. This statistic emphasizes the pervasive nature of weed proliferation, necessitating comprehensive and proactive measures to manage and mitigate their impact on crop growth and yields [10-14]. Implementing sustainable weed control practices becomes essential not only for preserving the nutritional integrity of cultivated crops but also for securing the economic viability of agriculture on a broader scale.

2 Materials and methods

Toylok district of Samarkand province (Uzbekistan), where various experiments have been conducted, is located in the southeastern part of Samarkand province. It is adjacent to Jomboy and Bulungur in the north, Urgut in the south and east, and Samarkand districts in the west. The climate of the district is continental, characterized by cold winters, mild springs, hot summers, and a high temperature range. According to the conducted research in the years 2017-2020, the average air temperature during the spring months of March and April was 14.2°C, 11.9°C, 11.2°C, and 15.6°C, 14.8°C, 15.1°C, respectively. In May, the average temperature was 20.0°C, 21.2°C, and 20.1°C. The precipitation, primarily in March and April, was abundant, with an average of 100.8-120.5 mm and 75.7-81.2 mm, respectively. The annual rainfall ranged from 39.4 mm to 445.6 mm. During June, July, and August, the average temperatures were 24.3-26.5°C, 28.1-30.1°C, and 25.3-25.6°C, respectively. The amount of rainfall during these months ranged from 1.6-21.1 mm, 1.8-3.6 mm, and 0.5-2.1 mm. The experimental field's soil is predominantly loamy, with a moderate mechanical composition and a depth of groundwater at 4-5 meters. The soil environment has a slightly alkaline pH of 7.1-7.3. The soil structure consists of two layers: 0-30 cm and 30-50 cm, with an average density ranging from 1.26% to 0.93%. The total nitrogen content is 0.112-0.091%,

and it is adequately supplied with phosphorus at 0.138-0.108%. The potassium content is relatively high, ranging from 2.39% to 2.32%.

The purpose of the study is to scientifically justify the use of methods and depth of soil tillage and optimal herbicide standards in the fight against weeds spread in onion fields in the conditions of irrigated meadow gray soils of Samarkand province, and to give recommendations for production.

The objectives of the research are to determine the effect of tillage depth and herbicide types and rates on the agrophysical properties of the soil and weeds in the onion fields in the conditions of the irrigated meadow-gray soils of the Samarkand province. It consists in the scientific justification of the relationship between the number of bushes, growth, development and yield when grown from onion seedlings, with the depth of tillage and the types and rates of herbicides.

In order to carry out scientific research, field experiments were conducted in 2017-2020, and as an experimental object, old irrigated meadow-gray soils, "Katinka F₁" hybrid of onion (*Allium cepa L.*), the main soil (ploughing 30-35 cm) and surface (chiseling 18-22 cm) treatment depth, Goal 2E with oxyfluorfen content, 24% and Select 120 KE herbicides with clethodim content were taken.

In the field experiments, experiments on the effects of soil treatment against weeds and herbicide standards were carried out in 10 variants, 3 replications, the area of each variant was 5.6 x 25.0 = 140 m², of which 70 m² were taken into account. the total area of the experiment was placed in 4200 m² [3]. In the experiment, after planting onion seedlings, seedling retention, the number, length and width of leaves on the plant, the diameter of the largest leaf, the onion-shaped fruits were determined based on the methods "Metodika fiziologicheskikh issledovaniy v ovoshchevodstve i bakchevodstve" [8].

Calculation of the yield of onions in the experiment was divided into goods and non-goods by weighing the harvest in options and repetitions, and the commodity part of the harvest was separately divided into standard and non-standard parts and determined according to GOST-1723-67. Productivity indicators were statistically analyzed by the method of dispersion analysis according to B.A. Dospikhov [5].

In the experimental field, the density of the soil in the 4th repetition in the 0-50 cm layer was measured by the cylinder method according to Kachinsky, and the porosity of the soil was calculated by the method; water permeability of the soil was determined in the 10th iteration according to the Kachinsky method [9]. Humus in the soil by the method of I.V. Tyurin; total nitrogen, total phosphorus and potassium by the method of I.M. Maltseva, L.P. Gritsenko; nitrate nitrogen in Grandwald-Lyaju, ammonium nitrogen in Netsler's reagent; mobile phosphorus in 1% ammonium carbonate solution by the method of B.M. Machigin; The exchanger was analyzed by the P.V. Protasov method in a potassium flame photometer [10].

3 Results

The introduction of advanced agricultural techniques and the use of efficient and modern soil cultivation methods have provided opportunities to significantly increase the productivity of crop fields. These methods have the potential to reduce the loss of 50-60% of annual crop yields due to weed growth [2]. However, one of their main drawbacks is the high energy consumption associated with these techniques. The development of new machinery and technologies has created possibilities for using minimal tillage methods, as well as soil conservation and resource-efficient technologies. Nevertheless, these methods have not yet solved the problem of effectively eradicating weeds from agricultural fields [6].

In a field experiment conducted in 2017 on a steppe experimental site, soil samples were taken from five points in front of the tillage (at a depth of 30-35 cm) to determine soil density and moisture content. The average soil density within the 0-30 cm depth was determined to

be 1.36 g/cm^3 , with a moisture content of 49.2%. At a depth of 30-50 cm, the soil density was determined to be 1.41 g/cm^3 , with a moisture content of 47.7%. No tillage was performed before plowing, while plowing (at a depth of 18-22 cm) was carried out on the fields. In the fields where plowing was performed, the average soil density within the 0-30 cm depth after three years was found to be 1.35 g/cm^3 , with a moisture content of 49.6%. At a depth of 30-50 cm, the soil density was determined to be 1.43 g/cm^3 , with a moisture content of 47.0%. At the end of the implementation of the tillage at a depth of 30-35 cm, the average soil density within the 0-30 cm depth and the 30-50 cm depth decreased by $0.03\text{-}0.05 \text{ g/cm}^3$ and $0.06\text{-}0.09 \text{ g/cm}^3$, respectively, compared to the initial values. The moisture content increased by 3.0-3.4% and 2.3-2.6% in the respective layers. This indicates a positive effect on soil water permeability. When tillage was carried out at a depth of 30-35 cm, the soil's water permeability was found to be $35.4\text{-}29.6 \text{ m}^3/\text{ha}$ ($502.2\text{-}525.1 \text{ m}^3/\text{ha}$) in the first three hours and a total of $80.2\text{-}82.4 \text{ m}^3/\text{ha}$ ($609.6\text{-}649.4 \text{ m}^3/\text{ha}$) within six hours, demonstrating a significant increase in water infiltration within a short period [6].

Before conducting experiments in the fields of irrigated lands, the quantity of weed seeds was determined before and after plowing, as well as before and after using herbicides, for 10, 20, and 30 days. When damage caused by weed infestation was identified before plowing in the initial stage of the experiment (in 2017), the average number of one-year-old weed plants per 1 m^2 was determined as follows: *Avena fatua* - 3-8 plants; *Echinochloa crusgalli* - 5-11; *Hordeum leporinum* - 1-10; *Setaria glauca* - 3-10 plants; *Bromus tectorum* - 2-6; *Lolium temulentum* - 3-9 plants; for two-year-old plants: *Atriplex flabellum* - 3-10; *Amaranthus retroflexus* - 2-6; *Chenopodium rubrum* - 4-8; *Xanthium strumarium* - 1-6; *Artemisia annua* - 2-5 plants, and for perennial plants: *Cynodon dactylon* - 1-3; *Elytrigia repens* - 1-3; for two-year-old plants: *Convolvulus arvensis* - 1-5 plants; *Rumex acetosella* - 1-3 plants, forming a total of 58-74 plants per 1 m^2 . It was determined that the quantity of one-year-old weed plants, especially annuals, was high in the experimental field.

Without plowing, after three years of continuous soil surface cultivation (cultivating to a depth of 18-22 cm), during the following 2-3 years, especially in the control (non-herbicide) plots, the number of one-year-old weed plants increased dramatically, ranging from 64-70 plants to 78-96 plants per 1 m^2 , while the number of perennial plants increased from 9-12 plants to 14-17 plants. The experiment showed that the weed infestation was significantly reduced when plowing was performed at a depth of 30-35 cm each year (2017-2019), before herbicide application. In this case, the average number of one-year-old plants was 39-46 plants per 1 m^2 , and for perennial plants, it was 10-11 plants per 1 m^2 , indicating a decrease in the number of weeds compared to the final year of the experiment.

When plowing to a depth of 18-22 cm, after 30 days of using herbicides in experimental fields cultivated with winter wheat, Goal 2E herbicide at a rate of 0.5 L/ha resulted in the control of two-year-old weeds at 82.3-87.8% and 83.2-87.4%, while at a rate of 1.0 L/ha, it achieved 85.8-88.5% and 86.5-89.5% control, respectively. The experiment showed that the herbicide doses (0.5-1.0 L/ha) had a lesser effect on two-year-old annual weeds (40.9-41.1% and 36.9-41.5% control) and did not affect one-year-old annual weeds and more (*Atriplex flabellum*, *Amaranthus retroflexus*, *Chenopodium rubrum*, *Xanthium strumarium*, *Artemisia annua*), reducing their number by 16-27 plants for one-year-olds and 3-7 plants for perennial weeds.

The use of Select 120 KE herbicide at rates of 0.5-1.0 L/ha resulted in higher control of one-year-old and perennial weeds in fields cultivated to a depth of 18-22 cm. In this case, the average control efficiency per 1 m^2 was 77.9-89.0% and 81.3-90.9% for one-year-olds, and significant reduction of *Cynodon dactylon* and *Elytrigia repens*, two perennial weeds, by 63.0-77.8% and 65.4-80.9%, respectively, was observed compared to Goal 2E herbicide (Table 1).

Table 1. The number of weeds 30 days after herbicide application in the experimental field planted from onion seedlings, in 1 m² /plant (average 2018-2020)

Types of weeds	Experience options									
	1. Surface treatment of the soil. Engraving 18-22 cm. Control without herbicide)	2. Surface treatment of the soil. Drawing 18-22 cm (FON I) +	3. BACKGROUND I + Goal 2E 1.0 l/ha	4. FON I + Select 120 KE - 0.5 l/ha	5. BACKGROUND I + Select 120 KE -	6. Plowing 30-35 cm. Control (no herbicide)	7. Plowing 30-35 cm (FON II) Goal 2E - 0.5 l/ha	8. FON II +Goal 2E 1.0 l /ha	9. FON II + Select 120 KE – 0.5 l/ha	10. FON II + Select 120 KE -1.0 l/ha
	Annual weeds									
1. Echinochloa crusgalli	<u>9.3</u> -	<u>2.1</u> 31.9	<u>2.4</u> 34.9	<u>3.7</u> 86.8	<u>3.3</u> 89.4	<u>2.7</u> -	<u>0.8</u> 32.7	<u>0.6</u> 36.9	<u>1.8</u> 90.6	<u>0.6</u> 92.8
2. Hordeum leporinum	<u>9.3</u> -	<u>2.7</u> 32.4	<u>2.4</u> 35.8	<u>5.6</u> 88.0	<u>5.7</u> 90.9	<u>3.7</u> -	<u>1.0</u> 34.1	<u>1.5</u> 37.1	<u>1.2</u> 91.9	<u>2.8</u> 93.5
3. Bromus tectorum	<u>6.0</u> -	<u>1.9</u> 26.7	<u>1.4</u> 28.9	<u>2.8</u> 83.3	<u>3.7</u> 85.7	<u>2.3</u> -	<u>0.5</u> 27.6	<u>0.8</u> 29.8	<u>1.8</u> 87.7	<u>2.4</u> 89.3
4. Lolium temulentum	<u>8.3</u> -	<u>2.3</u> 26.8	<u>1.8</u> 29.4	<u>3.8</u> 81.3	<u>6.2</u> 84.6	<u>4.0</u> -	<u>0.7</u> 28.3	<u>0.6</u> 31.9	<u>1.7</u> 85.7	<u>0.9</u> 88.8
5. Avena fatua	<u>4.3</u> -	<u>1.3</u> 33.2	<u>1.8</u> 35.3	<u>3.5</u> 88.5	<u>3.9</u> 90.1	<u>2.3</u> -	<u>0.9</u> 34.0	<u>0.9</u> 37.8	<u>1.8</u> 90.8	<u>1.6</u> 93.7
6. Setaria glauca	<u>10.8</u> -	<u>2.4</u> 32.2	<u>2.8</u> 36.9	<u>5.0</u> 88.2	<u>6.0</u> 90.4	<u>3.3</u> -	<u>0.9</u> 33.8	<u>0.8</u> 38.3	<u>2.5</u> 93.9	<u>2.2</u> 96.7
7. Atriplex flabellum	<u>9.6</u> -	<u>8.9</u> 86.4	<u>6.5</u> 88.3	<u>4.3</u> 43.1	<u>4.4</u> 45.3	<u>2.7</u> -	<u>1.5</u> 89.4	<u>1.9</u> 92.6	<u>0.8</u> 46.6	<u>1.0</u> 48.0
8. (Amaranthus retroflexus	<u>3.6</u> -	<u>2.3</u> 86.6	<u>2.9</u> 89.2	<u>1.9</u> 44.7	<u>1.5</u> 46.9	<u>1.7</u> -	<u>1.5</u> 88.0	<u>2.4</u> 90.5	<u>1.2</u> 49.7	<u>1.6</u> 52.5
9. Shenopodium rubrum	<u>10.6</u> -	<u>4.9</u> 85.2	<u>8.0</u> 86.5	<u>4.8</u> 44.9	<u>3.3</u> 45.6	<u>3.7</u> -	<u>2.9</u> 89.2	<u>2.1</u> 92.2	<u>1.7</u> 47.2	<u>1.1</u> 49.1
10. Xanthium strumarium	<u>3.0</u> -	<u>4.1</u> 87.4	<u>3.3</u> 89.5	<u>2.8</u> 49.5	<u>2.1</u> 52.3	<u>2.0</u> -	<u>1.8</u> 89.1	<u>1.2</u> 91.8	<u>1.0</u> 51.1	<u>1.1</u> 53.4
11. Artemisia annua	3 -	<u>3.6</u> 83.2	<u>3.5</u> 86.9	<u>2.2</u> 44.4	<u>2.4</u> 45.5	<u>1.7</u> -	<u>1.1</u> 85.1	<u>1.2</u> 89.7	<u>0.3</u> 47.2	<u>0.9</u> 50.6
	Perennial weeds									
1. Cynodon dactylon	<u>3.3</u> -	<u>3.3</u> -	<u>3.3</u> -	<u>1.1</u> 65.3	<u>2.2</u> 66.7	<u>2.3</u> -	2.3 -	<u>1.3</u> -	<u>1.6</u> 67.7	<u>1.4</u> 68.4
2. Elytrigia repens	<u>1.6</u> -	<u>2.6</u> -	<u>3.3</u> -	<u>1.5</u> 73.9	<u>0.8</u> 77.1	<u>1.3</u> -	<u>1.0</u> -	<u>1.0</u> -	<u>1.0</u> 75.2	<u>1.0</u> 78.6
3. Convolvulus arvensis	<u>4.0</u> -	<u>1.5</u> 44.3	<u>1.7</u> 45.5	<u>3.3</u> -	<u>3.0</u> -	<u>3.0</u> -	<u>1.5</u> 46.6	<u>1.4</u> 47.0	<u>2.0</u> -	2.3 -
4. Rumex acetosella	<u>2.6</u> -	<u>0.7</u> 39.7	<u>0.4</u> 43.8	<u>2.3</u> -	<u>1.3</u> -	<u>1.3</u> -	<u>0.4</u> 41.8	<u>1.2</u> 45.3	<u>1.7</u> -	<u>2.0</u> -
	Comment: up - piece/m ² , down- decrease in %									

Plowing with two passes of a disc plow at a depth of 30-35 cm, in all repetitions, Goal 2E and Select 120 KE herbicides showed higher efficiency compared to the fields where soil

surface cultivation (18-22 cm discing) was performed. For example, in the experimental field with plowing at a depth of 30-35 cm and in the control plots without herbicides, the average number of one-year-old weed plants per 1 m² was 34.7-30.1 plants. Based on the provided text, here is a summary:

The experiment aimed to investigate the effects of plowing and herbicide application on weed infestation in irrigated lands. The study measured the quantity of weed seeds before and after plowing, as well as before and after using herbicides, over different time periods (10, 20, and 30 days).

The initial findings showed a high number of one-year-old weed plants per 1 m² in the experimental field before plowing. The average number of various weed species ranged from 1-11 plants for one-year-old plants, 2-10 plants for two-year-old plants, and 1-3 plants for perennial plants, amounting to a total of 58-74 plants per 1 m².

Without plowing, after three years of continuous soil surface cultivation, the number of one-year-old weed plants dramatically increased, reaching 78-96 plants per 1 m². The number of perennial plants also increased from 9-12 plants to 14-17 plants. However, plowing at a depth of 30-35 cm each year before herbicide application significantly reduced weed infestation. The average number of one-year-old plants decreased to 39-46 plants per 1 m², and perennial plants decreased to 10-11 plants per 1 m².

Regarding herbicide application, Goal 2E herbicide at rates of 0.5-1.0 L/ha provided control of two-year-old weeds at 82.3-88.5% and 83.2-89.5%, respectively. However, it had a lesser effect on two-year-old annual weeds and did not affect one-year-old annual weeds and more. Select 120 KE herbicide at rates of 0.5-1.0 L/ha resulted in higher control of one-year-old and perennial weeds, achieving control efficiencies of 77.9-89.0% and 63.0-80.9%, respectively.

When plowing was performed at a depth of 30-35 cm, both Goal 2E and Select 120 KE herbicides showed higher efficiency compared to soil surface cultivation (18-22 cm discing). In the experimental field with deep plowing and without herbicides, the average number of one-year-old weed plants per 1 m² was 34.7-30.1 plants.

These results indicate that plowing at a greater depth and using herbicides can effectively reduce weed infestation in irrigated lands, particularly when applied before the emergence of one-year-old weed plants (Table 1).

4 Discussion

It should be noted that in the experiments, the highest biological efficiency in the fight against weeds in the care of onion seedlings was observed in the options where the Select 120 KE herbicide was applied at 0.5-1.0 l/ha in the background of 30-35 cm plowing, perennial, two-phase. Although *Convolvulus arvensis* and *Rumex* did not affect acetosella, on average one-year monocotyledons per 1m² were 85.2-93.4 and 85.7-96.7%, dicotyledons were 43.6-49.3 and 46.6-53.4%, it was found that it reduced perennial *Cynodon dactylon* and *Elytrigia repens* by 67.9-83.9 and 67.7-78.6% (Table 2). In experiments, increasing the rate of herbicides from 0.5 l/ha to 1.0 l/ha, there were no significant differences in weed efficiency (around 1.4-2.8%) among replicates.

As a result of surface treatment of the soil in the experimental area, and in the control option without herbicides, at the end of the period of operation (during the period when onion leaves start to turn yellow), the number of onion seedlings increased by 582.3-609.7 thousand plants/ha, respectively, compared to the initial indicators. (67.9-71.1%), plowing 30-35 cm, and in the control option without herbicides, 616.6-639.7 thousand bush/ha (71.9-74.6 %) was recorded. These indicators are on average 692.0-706.6 in the options where herbicides Goal 2E 0.5-1.0 l/ha, Select 120 KE 0.5-1.0 l/ha were used against the background of soil surface treatment; 698.0-709.2 and 710.9-721.2; It was 716.0-727.2 thousand bushes/ha

(80.7-82.4; 81.4-82.7 and 82.9-84.1; 83.5-84.8%). At the end of the period of operation, the maximum number of seedling plowing 30-35 cm is processed, Select 120 KE 0.5-1.0 l/ha is applied, on average in three years 770.9-775.2 thousand bush/ha (89.9-90.4%) compared to the herbicide-free control options 199.5-205.5 and 142.3-146.6 thousand bush/ha, compared to the options with Goal 2E 0.5-1.0 l/ha 52.5-49.5 and 35.1-36.8 thousand bush/ha were taken into account.

In the experiments, the quantity of bulbs, the average weight of the bulbs, the marketable and non-marketable yield indicators were taken into account in each variant and repetition. According to the mathematical-statistical analysis of the experimental data, the number of plant stems increases due to the death of weeds in both methods of tillage, and there is a parabolic relationship between the number of stems and productivity, the regression equation of the relationship is $y = a + bx - cx^2$ obeys (Fig. 1).

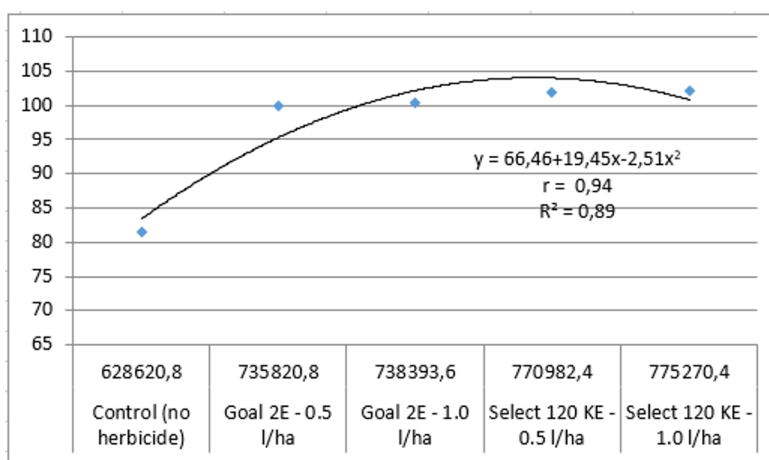


Fig. 1. Relationship between herbicide rates and the thickness of the bush number on onion yield (tillage 30-35 cm).

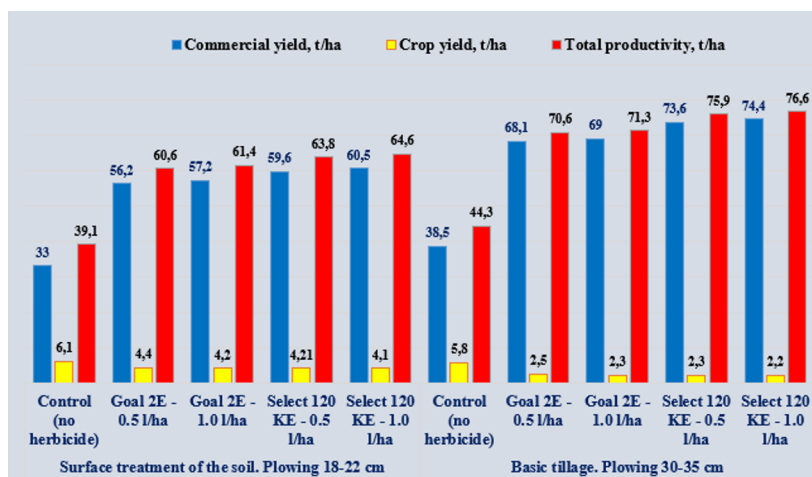


Figure 2. The effect of soil tillage depth and herbicide rates on onion yield in areas planted from onion seedlings (average 2018-2020).

In the experimental area, the average yield of the options in three years (2018-2020) was 39.1-76.6 tons/ha. The surface of the soil was treated (slicing 18-22 cm), and in the control

option without the use of herbicides, the quantity of marketable bulbs was 71.2%, the weight of the bulbs was 77.8 g. 23.2-24.2 compared to the control option when using Goal 2E herbicide 0.5-1.0 l/ha and Select 120 KE 0.5-1.0 l/ha against the background of surface treatment; 26.6-27.5 tons/ha of additional goods were obtained, the amount of goods was increased from 85.3-85.9 to 86.4-86.8%, the average weight of each onion was 94.3-94.5 to 96.2-96.5 g (Fig. 2)

5 Conclusions

In the conditions of the grassland gray soils of Samarkand province, in the cultivation of high-quality and high-quality commodity crops from onions, in the fight against weeds spread in the crop field, when plowing in the fall with a two-layer plow at a depth of 30-35 cm, the soil surface (chiseling) is 18-22 cm, the soil properties are improved compared to the tilled options. in the layer, the density of the soil decreases by 0.06-0.09 g/cm³, the porosity increases by 1.4%, and the water permeability is 80.2-82.4 m³ higher.

Against weeds, the soil is plowed to a depth of 30-35 cm, and in the maintenance of onion seedlings (in the period of 3-4 leaves), the herbicide Select 120 KE, which contains clethodim, is used at the rate of 0.5-1.0 l/ha, one-year weeds are 85.2-93.9 and 84.1-96.7%, perennials 67.7-81.4%; By killing 69.2-83.9%, maintaining the optimal number of seedlings (770.9-775.2 thousand units/ha) in the crop area at the end of the period of operation, the amount of marketable bulbs was 93.7-93.9%, the average weight was 101.9-102.2 g and 73.6-74.4 tons/ha of high-quality onion yield.

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