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THE EFFECT OF SOIL TILING METHODS AND THE USE OF HERBICIDES ON WEEDS FOUND IN AREAS OF POTATO CULTIVATION AS A REPRODUCTIVE CROP

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Annotation: When the soil is mainly cultivated with a two-tier plow to a depth of 28-30 cm, and Dafosat herbicide is applied at a rate of 4.0 kg/ha along with sowing against weeds, and Ridovn Xtra 75% herbicide is applied at a rate of 2.0 kg when 2-3 true leaves appear, weeds sharply decrease, creating favorable conditions for good growth and development of cultivated plants.

Keywords:agriculture, potato, yield, herbicides, growth and development, weeds, area

Introduction. Among agricultural crops, potatoes are considered the daily food product consumed by the population. Therefore, it is grown annually in the world on an area of 18-19 million hectares, yielding 3.1-3.3 million tons. In world agriculture, it is the second largest agricultural crop after wheat, rice, and corn in terms of area, and in terms of importance, it is used to prepare more than 500 different dishes.

Potatoes are considered the second bread among the population due to their high consumption. One of the main reasons for this is that potato tubers are rich in nutrients necessary for the human body - starch, protein, sugar, fiber, various vitamins, and mineral elements.

Among the European, Asian, North American, South American, African, and Oceanian continents growing potatoes in the world, the countries of the European continent are in first place, and in terms of potato cultivation - the sown area is 9145 thousand hectares, and the gross harvest is 138.2 million tons.

According to the Food and Agriculture Organization of the United Nations (FAO), global potato production could double within 10 years, making a significant contribution to global food security. By focusing on increasing yields and fully utilizing historical potato fields, global production could reach 500 million tons by 2025 and 750 million tons by 2030. (FAO report 2023).

In Uzbekistan, potatoes have been grown mainly for food purposes for 160 years. Potatoes are grown by farmers, agricultural clusters, and household plots.

Population growth, limited land and water resources used in agriculture. Therefore, in our country, with the rational use of opportunities, in order to provide the population with high-quality food products and develop product exports, great attention is paid to sowing repeated crops in areas freed from grain.

In order to develop this industry, the Resolution of the President of the Republic of Uzbekistan dated May 6, 2020 No. PP-4704 "On measures to expand potato cultivation and further develop seed production in the republic" was adopted. In accordance with the resolution, special attention is paid to increasing the production of consumer and seed potatoes in the

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country, expanding cluster and cooperation mechanisms in the field of potato growing, creating a value-added chain in the industry based on modern technologies, meeting the demand of the domestic market, expanding its exports, growing super-elite and elite generations of seed potatoes on 50 percent of sown areas, and widely introducing advanced technologies, innovative solutions, and scientific achievements.

The aim of the research is to improve integrated control measures against weeds on potatoes planted as a repeated crop in the conditions of meadow-saz soils of the Fergana region.

The scientific novelty of the research is as follows: for the first time, the influence of combined weed control on weeds in potato fields planted as a repeated crop in the conditions of meadow-bog soils of the Fergana region has been determined;

The influence of combined weed control on the agrophysical, water-physical, and agrochemical properties of the soil in potato fields sown as a repeated crop is determined;When cultivating potatoes grown as a repeated crop, various methods of soil cultivation and the application of herbicides have a positive effect on the growth, development, yield, and quality indicators of potatoes;

the economic effectiveness of herbicides used in combination with methods of soil cultivation against weeds in potato fields planted as a repeated crop in the cultivation of potatoes is explained.

EXPERIMENTAL SYSTEM AND METHODS OF ITS CONDUCT

Field experiments will be conducted in the conditions of meadow-saz soils of the Fergana region in 2024-2026. The soil of the experimental plot has a medium loamy mechanical composition, is long-irrigated, non-saline, the groundwater level is at a depth of 4-5 meters.

Experimental system

№	Potatoes (2024-2026)			
	Method of soil cultivation	Name of herbicides	Herbicide application period	Herbicide rate, g, kg/ha
1	Plowing to a depth of 28-30 cm with a regular plow	Control, herbicide-free	-	-
2		Standard	Along with sowing	4,0 kg
3		Ridovn Xtra 75%,	When 2-3 true leaves appear	2,0 kg
4		Dolfuron 25%	In bloom	30 g
5	Plowing with a two-tier plow to a depth of 28-30 cm	Control, herbicide-free		-
6		Standard	Along with sowing	4,0 kg
7		Ridovn Xtra 75%,	When 2-3 true leaves appear	2,0 kg

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8		Dolfuron 25%	In bloom	30 g

Research conducted on potatoes (2024-2026). It is carried out in 8 variants, 4 repetitions, and 2 layers. The area of each variant is 360 m2, the accounting area is 180 m2. The total area of the experiment is 0.30 hectares.

RESEARCH RESULTS

B. Bakhromov, F. Khasanova, Z. Jumaboev [37; P. 35-36), S. Bakhromov [38; 64-b.] compared to plowing to a depth of 25-30 cm with a two-tier plow in autumn, the degree of weed infestation of plants with conventional (single-tier) plowing increased by 2.5 times (31%).

The current period of development requires accelerating agriculture with innovative technologies, strengthening the fight against weeds, and improving control methods. In reducing weed damage, combined use of herbicides along with various soil cultivation methods creates the possibility of their complete elimination.Taking these circumstances into account, when implementing integrated control measures against weeds, in order to determine the effectiveness of the use of herbicides along with the main soil tillage methods on weeds in potato fields planted as a repeated crop, the number of weeds was taken into account before the main soil tillage and surface tillage.

The obtained data (2024) show that when taking into account the number of weeds in the field before soil cultivation with a conventional plow to a depth of 28-30 cm, the number of annual weeds was 28 units/m2, while in perennial weeds this indicator was 23 units/m2. In summer (2024), taking into account the number of weeds before surface tillage on this background, it was noted that the number of annual weeds was 13 units/m2, and the number of perennial weeds was 13 units/m2.

When taking into account the number of weeds in the field before plowing to a depth of 28-30 cm with a two-tier plow, the number of annual weeds was 29 units/m2, while in perennial weeds it was 22 units/m2. In summer (2024), when taking into account the number of weeds before surface tillage on this background, it was noted that the number of annual weeds was 9 units/m2, and the number of perennial weeds was 8 units/m2.

As can be seen from the obtained data, when plowing with a two-tier plow to a depth of 28-30 cm, compared to soil tillage with a conventional plow to a depth of 28-30 cm, the germination of annual weeds was 4 units/m2, and perennial weeds - 3 units/m2.

Based on the above data, it can be concluded that plowing with a two-tier plow to a depth of 28-30 cm, compared to soil cultivation with a conventional plow to a depth of 28-30 cm, leads to the burial of weed residues and seeds in deep layers, which explains the low germination of their seeds and rhizomes (Table 4.1).

In our study, in order to study the effectiveness of the combined use of herbicides during the growing season of potatoes in combination with basic soil tillage against weeds, the number of weeds in all variants of the experimental plot was taken into account after 20, 40, and 60 days.

According to the data obtained from the observations, in the control variant, where the soil was cultivated with a conventional plow to a depth of 28-30 cm and herbicides were not used against weeds, in our first observation, a one-year experiment was conducted.The number of annual weeds was 21.45 units/m2, the number of perennial weeds was 14.40 units/m2, in the variant with the application of the herbicide Dafosat at a rate of 4.0 kg/ha with sowing, the

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number of annual weeds was 20.45 units/m2, perennials - 13.85 units/m2, in the variant with the application of the herbicide Ridovn Xtra 75% at a rate of 2.0 kg with the emergence of 2-3 true leaves, the number of annual weeds was 21.15 units/m2, perennials - 14.55 units/m2.

In the control variant with plowing with a two-tier plow to a depth of 28-30 cm and without the use of herbicides against weeds, in our first observations, the number of annual weeds was 16.93 units/m2, and the number of perennial weeds was 11.95 units/m2, in the variant with the application of the herbicide Dafosat at a rate of 4.0 kg/ha with sowing, the number of annual weeds was 16.40 units/m2, and perennial weeds - 11.70 units/m2, in the variant with the application of the herbicide Ridovn Xtra 75% at a rate of 2.0 kg with the emergence of 2-3 true leaves, the number of annual weeds was 16.85 units/m2, and perennial weeds - 12.20 units/m2.

In the experiment, in order to determine the effectiveness of soil tillage methods against weeds and the combined use of herbicides, after 20 days, in the control variant with soil tillage with a conventional plow to a depth of 28-30 cm and without the use of herbicides against weeds, the number of annual weeds increased by 28.20 units/m2 (32.5%), and the number of perennial weeds increased by 16.80 units/m2 (18.6%), in the variant with the application of the herbicide Dafosat at a rate of 4.0 kg/ha with sowing, the number of annual weeds decreased by 6.65 units/m2 (67.2%), and perennial weeds by 3.75 units/m2 (73.2%), in the variant with the application of the herbicide Ridovn Xtra 75% at a rate of 2.0 kg with the emergence of 2-3 true leaves, the number of annual weeds decreased by 4.60 units/m2 (77.7%), and perennial weeds increased by 15.30 units/m2 (5.1%).In the control variant with plowing with a two-tier plow to a depth of 28-30 cm and without the use of herbicides against weeds, the number of annual weeds increased by 20.80 units/m2 (23.8%), and the number of perennial weeds - by 23.8%.

In the variant with the application of the herbicide Dafosat at a rate of 4.0 kg/ha with sowing, the number of annual weeds decreased by 4.70 units/m2 (73.9%), perennial weeds by 2.30 units/m2 (82.0%), and in the variant with the application of the herbicide Ridovn Xtra 75% at a rate of 2.0 kg with the emergence of 2-3 true leaves, the number of annual weeds decreased by 2.60 units/m2 (84.1%), while the number of perennial weeds increased by 12.63 units/m2 (3.6%).

In order to account for weeds in the experiment, we conducted a second observation after 40 days.The obtained results show that in the control variant with soil cultivation with a conventional plow to a depth of 28-30 cm and without the use of herbicides against weeds, the number of annual weeds increased by 28.95 units/m2 (35.0%), and the number of perennial weeds by 17.20 units/m2 (21.8%), in the variant with the application of the herbicide Dafosat at a rate of 4.0 kg/ha with sowing, the number of annual weeds decreased by 6.25 units/m2 (69.3%), and perennial weeds by 3.62 units/m2 (73.9%), in the variant with the application of the herbicide Ridovn Xtra 75% at a rate of 2.0 kg with the emergence of 2-3 true leaves, the number of annual weeds decreased by 4.27 units/m2 (79.5%), and perennial weeds increased by 15.65 units/m2 (7.6%).

In the control variant with basic tillage of the soil with a two-tier plow to a depth of 28-30 cm and without the use of herbicides against weeds, the number of annual weeds increased by 21.35 units/m2 (26.1%), and the number of perennial weeds increased by 13.91 units/m2 (18.5%), and these indicators in the variant with the application of the herbicide Dafosat at a rate of 4.0 kg/ha with sowing, the number of annual weeds decreased by 3.75 units/m2 (75.9%), and perennial weeds by 2.14 units/m2 (82.7%), in the variant with the application of the herbicide

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Ridovn Xtra 75% at a rate of 2.0 kg with the emergence of 2-3 true leaves, the number of annual weeds decreased by 2.40 units/m2 (85.4%), but the number of perennial weeds increased by 12.86 units/m2 (5.1%).

Conclusion: When applying the herbicide Dafosat at a rate of 4.0 kg/ha with the main tillage of the soil with a two-tier plow to a depth of 28-30 cm and simultaneous sowing against weeds, when applying the herbicide Ridovn Xtra 75% at a rate of 2.0 kg with the emergence of 2-3 true leaves, a sharp decrease in weeds occurs and favorable conditions are created for the growth and development of cultivated plants.

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