THE EFFECTS OF DIFFERENT SOIL PROCESSING DEPTHS ON THE DISTRIBUTION OF WEEDS THROUGH SOIL LAYERS IN IRRIGATED LAND

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ABSTRACT

This article present, under the conditions of typical gray soils of the Samarkand region In the areas of onion cultivation, the main tillage is 30-35 cm, and the tillage on the soil surface (hollowing) is 18-22 cm.

When tilling the soil to a depth of 30-35 cm, 61.0-70.7% of weeds fall into the layer of 25-35 cm, losing fertility, which leads to their reduction and creates favorable conditions for the growth and development of crops.

Keywords. Tillage, plowing, chiselling, minimum, no tillage, weeds.

INTRODUCTION

Today, in order to restore the fertility of lands and protect soil resources in agriculture, resource-saving technologies in various soil climatic conditions - surface tillage, "direct sowing" - No-till zero technologies are widely used in tillage in many countries. A number of scientists have come to different conclusions in this regard in their studies on deep, surface and zero tillage of the soil [8; 64-67 p .; 5; 19-21 p .; 3; 7-14 p.]

Many years of research in Canada have shown that No-till processing technology has led to the proliferation of certain types of annual and perennial weeds. However, farmers who continued to use the technology after 5–10 years observed a decrease in the population of these weeds [10; 29-37 p.]. The reason is that many seeds of weeds die when they remain on the ground. In mechanical tillage, on the other hand, it is thought that the seeds are buried deep in the soil and retain a certain amount of germination.

V.V. Kulintsev, V.K. Driediger and others [4; p. 9-11]. In a study of the economic efficiency of tillage conducted in Russia, the increase in economic efficiency in the cultivation of crops was achieved through the methods of minimum and zero (No-till) tillage, while the economic efficiency of traditional (deep plowing) tillage was 21.7%, minimum surface processing 23.1% and zero processing 45.9%, Baertuev A. A., Filatov A. M. [1; 19-21p.], Sh.Kh. Rizaev [7; 186-188p.], Sh. Rizaev, A. Makhmatmurodov, A. Joraev, K. Sharifov [9; 551-558p.], while in the fight against weeds their seeds depend on the depth of the driving layer, weed seeds 0-5; Given that it is difficult to germinate quickly from layers of 5-10 and 10-15 cm, it is recommended to till the soil to a depth of 30-35 cm in areas infested with weeds.

MATERIALS AND METHODS

Considering the above, we have carried out studies to study the effect of different depths of tillage on the distribution of soil weediness indicators in onion growing areas under conditions of typical irrigated gray soils of the Samarkand region. In our field experiments, we studied the main tillage of 30-35 cm and the surface (minimum) 18-22 cm chisel agricultural technologies. Soil samples were taken every 5 cm (0, 5, 10, 15, 20, 25, 30, 35) layers of 3 points of each studied variant and the number of weed seeds was determined in them according to I.N. Shevelev [12]. ; 76p].

The results obtained and their analysis. The results of field experiments show that the main tillage is plowing (30-35 cm) and minimal (chisel, 18-22 cm) in cultivated variants in a layer of 0-35 cm, mainly from annual monocotyledons weeds - Avena fatua (L.), Echinochloa crusgalli (L.), Hordeum leporinum, Setaria qlauca (L.), dicotyledonous Stellaria media (L.), Chenopodium rubrum (L.), Amaranthus retroflexus (L.), Xanthium strumarium (L.), Artemisia annua (L.), Capsella bursarastoris (L.) Medik and perennials such as Rumex acetosella, Convolvulus arvensis (L.), Cynodon dactylon (L.) Pers seeds (Table 1).

The distribution of weed seeds on the studied soil layers is high in annual biennials, in which the main tillage is plowed by 30-35 cm, and the surface (chisel) by 18-22 cm, respectively, by 0-35 cm - Chenopodium rubrum (L.)-119-195, Artemisia annua (L.) - 134-151, Amaranthus retroflexus (L.) - 114-141, Stellaria media (L.) - 108-127, Xanthium strumarium (L.) - 44-33, Capsella bursarastoris (L.) Medik - 57-68, Monocotyledons – Echinochloa crus-galli (L.) – 117-143, Setaria qlauca (L.) - 96-122, Hordeum leporinum - 92 - 113, Avena fatua (L.) - 77-94 grains. According to the data

obtained, the spread of weeds in the soil layers is directly dependent on the depth of tillage. For example, in a layer of 5-10 cm there are 45.6-67.8% of seeds of annual weeds, in a layer of 15-20 cm - 16.1-27.5%, in a layer of 25-35 cm - 2.1-13, 5% (Table 1).).

The fight against perennial weeds in agriculture requires a lot of money and labor. When analyzing our field experiments with deep and surface tillage, the distribution of perennial weeds in the thickness of the arable layer was revealed, respectively: Rumex acetosella - 91-103 pieces, Convolvulus arvensis (L.) - 74-86, Cynodon dactylon (L.) Pers - 73-81. units, processing 18-22 cm. in these options, 42.7-58.0% of weeds are placed in the soil layer of 5-10 cm, 17.3-27.2% in the layer of 15-20 cm, on the surface of the arable layer observed.

Regardless of the surface tillage (chiselling 18-22 cm), annual and perennial weeds in the 25-35 cm layer of the arable layer are 2.1-13.5 and 7.8-12.3%, or 1 in 35 cm, respectively 2-3.9 (Table 1). This is due to the biological properties of weeds, which indicate that their seeds retain a certain germination capacity for many years, regardless of whether they fall into deeper layers of the soil.

Table 1

The effect of tillage on the distribution of weed seeds along the soil layers at a depth of 18-22 cm above the soil surface (chiseling), (2018-2019)

Weed species	Soil layer, cm								Total, pieces
	0	5	10	15	20	25	30	35	
Avena fatua (L.)	8 * (8,5)**	27 (28,7)	31 (33,0)	11 (11,7)	7 (7,5)	7 (7,5)	3 (3,2)	0	94
Echinochloa crusgalli (L.)	11 (7,7)	54 (37,7)	43 (30,1)	24 (16,8)	8 (5,6)	3 (2,1)	0	0	143
Hordeum leporinum	4 (3,5)	31 (27,4)	38 (33,6)	21 (18,6)	10 (8,9)	6 (5,3)	3 (2,7)	0	113
Setaria qlauca (L.)	0	48 (39,3)	27 (22,1)	18 (14,7)	13 (10,7)	9 (7,4)	4 (3,3)	3 (2,4)	122
Stellaria media (L.)	28 (22,0)	28 (22,0)	32 (25,2)	14 (11,0)	10 (7,9)	8 (6,3)	5 (3,9)	2 (1,6)	127
Chenopodium rubrum (L.)	31 (15,9)	53 (27,2)	48 (24,6)	33 (16,9)	20 (10,2)	13 (6,7)	7 (3,6)	3 (1,5)	195
Amaranthus retroflexus (L.)	23 (16,3)	43 (30,5)	25 (17,7)	18 (12,8)	13 (9,2)	9 (6,4)	8 (5,7)	2 (1,4)	141

Xanthium strumarium (L.)	2 (6,1)	10 (30,3)	11 (33,3)	3 (9,1)	3 (9,1)	1 (3,0)	2 (6,1)	1 (3,0)	33
Artemisia annua (L.)	38 (25,2)	43 (28,5)	31 (20,5)	22 (14,5)	13 (8,6)	4 (2,6)	0	0	151
Capsella bursarastoris (L.) Medik	21 (30,9)	18 (26,5)	13 (19,1)	6 (8,8)	5 (7,3)	3 (4,4)	2 (2,9)	0	68
Rumex acetosella	27 (26,2)	20 (19,4)	24 (23,3)	17 (16,5)	7 (6,8)	4 (3,9)	0	4 (3,9)	103
Cynodon dactylon (L.) Pers	13 (16,0)	27 (33,3)	20 (24,7)	8 (9,9)	3 (3,7)	3 (3,7)	4 (4,9)	3 (3,7)	81
Convolvulus arvensis (L.)	22 (25,6)	23 (26,7)	16 (18,6)	14 (16,3)	4 (4,6)	3 (3,5)	3 (3,5)	1 (1,2)	86
Note: * - Weeds in units ** - Weeds in percentage									

Also, in our field experiments, as a result of surface tillage (18-22 cm), the bulk of annual and perennial weed seeds accounted for 86.5-97.9% of the soil in a 0-20 cm layer, growth based on our experimental results, weed infestation has been proven once again.

The main task of tillage is to increase soil fertility. As a result of timely and quality processing, the plowed layer is fine-grained, which creates conditions for the accumulation and storage of moisture in the soil, improving its air and nutrient regimes. However, such treatment is one of the most important agrotechnological measures to prevent infection of crop areas [2; 152-155 b .; eleven; Pages 22-25; 6; 3-5 b.].

In our field experiments, we studied the effect of weeds in an onion field on the degree of soil pollution at a depth of 30-35 cm, the data are presented in Table 2. Our data show that during the main tillage of 30-35 cm with a PYa-3-35 plow, it was noted that the main part of the weed seeds was located on 44.5-54.4% of the plowed bottom soil layer. 30-35 cm, almost no weeds were observed in the surface layer of soil (2.1-4.6%). The spread of weeds in the corral layer starts from 5-10 cm, and annual and perennial plants in this layer, respectively, 3.5-15.9; 9.4–12.1%, 18.2–28.1% in the 15–20 cm layer; 20.8-24.3%, while the main part of the weeds 61.0-70.7; 62.2–67.1% were found to be distributed over 25–35 cm.

CONCLUSION

The results of our field experiments show that surface tillage (chiselling 18-22 cm) in agriculture leads to contamination of areas where 86.5-97.9% of the seeds are scattered in a layer of

0-20 cm of the surface and germinate quickly under such conditions. conditions, absorbing a large amount of water, nutrients and light from the soil during the season, damaging crops, leading to a sharp decrease in yield and crop quality, and worsening the phytosanitary condition of the sown area due to the formation of a large number of seeds.

When carrying out the main tillage to a depth of 30-35 cm, 61.0-70.7% of the main part of the weeds falls into the layer of 25-35 cm and loses fertility, the water regime will improve, favorable conditions for irrigation and good absorption of precipitation, as well as for the growth and development of crops.

Table 2

The effect of tillage on the main layers of soil to a depth of 30-35 cm, the distribution of weed seeds across the soil layers, (2018-2019)

Weed species	Soil layer, cm								Total, pieces
	0	5	10	15	20	25	30	35	
Avena fatua (L.)	0	3* (3,9)**	7 (9,1)	8 (10,4)	12 (15,6)	12 (15,6)	17 (22,0)	18 (23,4)	77
Echinochloa crusgalli (L.)	3 (2,6)	4 (3,4)	4 (3,4)	10 (8,5)	17 (14,5)	24 (20,5)	26 (22,2)	29 (24,8)	117
Hordeum leporinum	0	3 (3,3)	5 (5,4)	8 (8,7)	11 (11,9)	19 (20,7)	21 (22,8)	25 (27,2)	92
Setaria qlauca (L.)	2 (2,1)	4 (4,1)	6 (6,2)	9 (9,4)	12 (12,5)	16 (16,7)	21 (21,9)	26 (27,1)	96
Stellaria media (L.)	5 (4,6)	4 (3,7)	7 (6,5)	11 (10,2)	14 (13,0)	17 (15,7)	23 (21,2)	27 (25,0)	108
Chenopodium rubrum (L.)	0	4 (3,4)	9 (7,6)	12 (10,1)	18 (15,1)	23 (19,3)	28 (23,5)	25 (21,0)	119
Amaranthus retroflexus (L.)	3 (2,6)	4 (3,5)	7 (6,1)	11 (9,6)	15 (13,2)	21 (18,4)	24 (21,1)	29 (25,4)	114
Xanthium strumarium (L.)	0	5 (11,4)	2 (4,5)	3 (6,8)	5 (11,4)	8 (18,2)	9 (20,4)	12 (27,3)	44
Artemisia annua (L.)	3 (2,2)	6 (4,5)	9 (6,7)	13 (9,7)	18 (13,4)	22 (16,4)	35 (26,1)	28 (20,9)	134
Capsella bursarastoris (L.) Medik	0	2 (3,5)	0	5 (8,8)	11 (19,3)	8 (14,0)	13 (22,8)	18 (31,6)	57
Rumex acetosella	0	5 (5,5)	6 (6,6)	8 (8,8)	11 (12,0)	18 (19,8)	20 (22,0)	23 (25,3)	91

Cynodon dactylon (L.) Pers	0	3 (4,1)	5 (6,8)	6 (8,2)	11 (15,0)	15 (20,5)	15 (20,5)	18 (24,7)	73
Convolvulus arvensis (L.)	3 (4,0)	4 (5,4)	3 (4,0)	8 (10,8)	10 (13,5)	10 (13,5)	17 (23,0)	19 (25,7)	74
Note: * - Weeds in units ** - Weeds in percentage									

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