British Journal of Global Ecology and Sustainable Development
Volume- 44, September 2025
ISSN (E): 2754-9291

EFFECT OF APPLICATION OF STOP BEK AND ZELEK BEK HERBICIDES AGAINST TYPES OF WEEDS IN COTTON FIELDS

Mustafayeva Ozoda Ilashevna1,
1 Phd Student of Department of Farming and Melioration,
Tashkent State Agrarian University

Shodmanov Makhkam2
2 Associate Professor of Department of Farming and Melioration,
Tashkent State Agrarian University

ABSTRACT

The article presents data on the effect of the use of Stop Bek, 33% and Zelek Bek 10.8% herbicides against annual and perennial weeds in cotton fields under the conditions of typical gray soils of the Tashkent region. When Stop Bek, 33% s.c. herbicide was applied at a rate of 1.35 l/ha, annual weeds were destroyed by 85.0-88.1%, and cotton yield was 4.2 q/ha higher than the control option. When Zelek Bek 10.8% herbicide was applied at a rate of 0.7 l/ha, perennial weeds were reduced by 83.9 -87.9% and a yield of 3.6 q/ha was obtained. When Stop Bek, 33% s.c. herbicide was applied at a rate of 1.35 l/ha together with cotton planting and Zelek Bek 10.8% herbicide was applied at a rate of 0.7 l/ha after the first cotton harvest, annual weeds were reduced by 87.3-93.5% and perennial weeds by 87.2-91.7%, and a yield of 5.6 q/ha was obtained from cotton compared to the control variant.

Keywords: Weeds types , herbicides, cotton yield, cotton variety C-6524, Stop Bek, 33% s.c. and Zelek Bek 10.8% herbicides.

1. INTRODUCTION

Weeds belonging to different families are adapted to grow in certain ecological conditions. For example, among cotton, plants such as common hedgehog (Echinochloa crus-galli L.), wild Amaranthus retraflexus (Amaranthus retraflexus), Purslane (Portulaca oleraceae L.), black nightshade (Solanum nigrum L.), White goosefoot (Cyhenopodium album L.) are adapted to grow, among wheat, plants such as wild oat (Avena fatua L.), shepherd's purse (Capsella bursa pastorris Medue), Loose silky bentgrass (Apera spica venti L.), bromegrass (Bromus secalinus L.), White goosefoot (Cyhenopodium album L.), cleavers (Galium aparine), chickweed (Stellaria media L.), tulip poppies (Papaver rhoeas) grow. The scientific use of wheat-cotton crop rotation allows us to reduce these weeds by drastically changing their growing conditions [1,4].
Herbicides affect different weeds differently. The continuous use of one herbicide leads to an increase in the number of weeds that are resistant to this herbicide. As a result, the effectiveness of chemical weed control measures decreases year by year. To prevent this, it is necessary to alternate, apply one after the other, or apply them together.

Therefore, in our experiments, we set the goal of obtaining higher and higher quality cotton yields by increasing the effectiveness of weed control measures in cotton fields.

2. MATERIALS AND METHODS

Field experiments were conducted in the conditions of typical gray soils of the Tashkent region. Along with sowing against annual weeds in cotton fields, herbicides Stop Bek, 33% s.c., and against perennial weeds Zelek Bek, 10.8% s.d.g were applied separately and sequentially. Field experiments were conducted in 10 variants and 4 replications. The total area of each plot was 144 m2.

Table 1 Experimental scheme

Options number	Options	Herbicide rate, l/ha
1.	Control (without herbicide)	-
2.	Stomp, 33 % s.c.	1.5
3.	Stop Bek, 33 % s.c..	1.0
4.	Stop Bek, 33 % s.c..	1.35
5.	Stop Bek, 33 % s.c..	1.5
6.	Zellek-super, 104 g/l s.c.	1.0
7.	Zelek Bek, 10.8 % s.c.	0.5
8.	Zelek Bek, 10.8 % s.c.	0.7
9.	Zelek Bek, 10.8 % s.c.	1.0
10.	Stop Bek + Zelek Bek	1.35 + 0.7

Cotton variety C-6524 was grown. Stop Bek 33% s.c. herbicide was applied in spring along with cotton planting against annual weeds using a tape method. Zelek Bek was applied after the first tillering of cotton when perennial weeds reached a height of 10-15 cm.

Phenological observations and biometric measurements in the experimental field were carried out according to the methods of UzCRSI “Methodology of field experiment” [3] and B.A. Dospekhov “Methodology of field experiment”, [1].

Journal Zone Publishing, Ilford, United Kingdom

3. RESULTS AND DISCUSSION

3.1. The effect of herbicide use on weeds

To effectively combat weeds growing among agricultural crops, it is necessary to implement a combination of agrotechnical and chemical measures that prevent their spread. Because implementing each measure separately and being limited to one or another measure may not give the expected result. The use of herbicides is the most effective method, since it allows you to eliminate weeds in a timely manner by applying herbicides to large areas in a short time.

One herbicide affects different weeds differently. Therefore, the continuous use of one herbicide leads to an increase in the number of weeds resistant to these herbicides. This negative process can be stopped by alternating the use of herbicides with different ranges of action, using mixtures, and applying them one after the other.

The number of weeds was counted after the first, second and third irrigation of cotton, before cultivation. In the first accounting period (2021-2023), the control variant contained 18.4 plants of common hedgehog, 6.75 plants of white goosefoot, 5.16 plants of black nightshade, 4.73 plants of Amaranthus retraflexus, 3.48 plants of Purslane, 1.15 plants of (Convolvulus arvensis L.) field bindweed, and 2.85 plants of Johnson grass (Sorghum halepense) per m2 of land. The total number of annual weeds in the control variant was 38.5 plants/m2 (Table 3.1.1). We see that the number of weeds has significantly decreased in the variants where herbicides were used. Stomp, 33% herbicide applied at a rate of 1.5 l/ha, showed 2.58 pieces of common hedgehog (Echinohloa crus-galli), 1.01 pieces of White goosefoot (Cyhenopodium album), 0.78 pieces of black nightshade (Solanum nigrum L.), 0.53 pieces of wild Amaranthus retraflexus (Amaranthus retraflexus), 0.35 pieces of Purslane (Portulaca oleraceae), a total of 5.26 pieces/m2 of annual weeds. Among perennial weeds, 2.26 pieces of Johnson grass (Sorgum halepense) and 0.96 pieces of field bindweed (Convolvulus arvensis) were found.

Stop Bek, 33% herbicide applied at a rate of 1.0 l/ha, showed 3.0 pieces of common hedgehog (Echinohloa crus-galli, 1.18 pieces of The presence of white goosefoot (Cyhenopodium album), 0.86 pieces of black nightshade (Solanum nigrum), 0.80 pieces of wild amaranthus retraflexus (Amaranthus retraflexus), 0.56 pieces of Purslane (Portulaca oleraceae), 2.55 pieces of Johnson grass (Sorgum halepense) and 1.03 pieces of field bindweed (Convolvulus arvensis) was taken into account. In the variant where Stop Bek, 33% herbicide was used at a rate of 1.35 l/ha, the reduction of annual weeds was slightly more effective than the second variant. In this variant, 2.18 pieces of common hedgehog (Echinochloa crus-galli, 0.83 pieces of white goosefoot (Cyhenopodium album), 0.55 pieces of black nightshade (Solanum nigrum), 0.46 pieces of wild amaranthus retraflexus (Amaranthus retraflexus), 0.38 pieces of Purslane (Portulaca oleraceae), 2.26 pieces of A total of 4.41 annual weeds and 3.23 perennial weeds were counted, including Johnson grass (Sorghum halepense) and 0.96 field bindweed (Convolvulus arvensis).

Journal Zone Publishing, Ilford, United Kingdom

Table 3.1.1 Impact of herbicides on weed species, units/m2, 1st account (2021-2023)

No	Options	Herbicide rate, l/ha	Annual weeds						Perennial weeds		
			Echinochloa crus-galli	Cyhenopodium album	Solanum nigrum	Amaranthus retraflexus	Portulaca oleracea	Total	Sorghum halepense	Convolvulus arvensis	Total
1.	Control, without herbicide	-	18.4	6.75	5.16	4.73	3.48	38.5	2.85	1.15	4.0
2.	Stomp, 33 % s.c.	1.5	2.58	1.01	0.78	0.53	0.35	5.26	2.26	0.96	3.22
3.	Stop Bek, 33 % s.c.	1.0	3.0	1.18	0.86	0.80	0.56	6.45	2.55	1.03	3.58
4.	Stop Bek, 33 s.c.	1.35	2.18	0.83	0.55	0.46	0.38	4.41	2.26	0.96	3.22
5.	Stop Bek, 33 % s.c.	1.75	1.95	0.68	0.48	0.36	0.28	3.76	2.23	0.95	3.18
6.	Zellek-super, 104 g/l s.c.	1.0	5.86	2.5	1.76	1.58	1.08	12.8	0.25	0.30	0.55
7.	Zelek Bek, 10,8 % s.c.	0.5	6.25	2.70	1.98	1.7	1.33	13.96	0.38	0.36	0.75
8.	Zelek Bek, 10,8 % s.c.	0.7	5.56	2.41	1.38	1.33	1.16	12.0	0.23	0.25	0.48
9.	Zelek Bek, 10,8 % s.c.	1.0	4.85	2.08	1.23	1.05	0.9	10.11	0.20	0.23	0.43
10.	Stop Bek + Zelek Bek	1.35+0.7	1.23	0.50	0.33	0.25	0.20	2.51	0.15	0.18	0.33

In the variant where Zelek Bek, 10.8% k was used at a rate of 0.7 l/ha, the number of annual weeds was 12.0 units/m2. The number of perennial weeds was 0.48 units/m2.
In the variant where Stop Bek, 33% herbicide was used at a rate of 1.35 l/ha along with sowing seeds and Zelek Bek, 10.8% herbicide was used at a rate of 0.7 l/ha after the first irrigation of cotton, both annual weeds and perennial weeds were effectively reduced. In this variant, the presence of annual weeds per square meter of land was taken into account: 1.23 Echinochloa crus-galli, 0.50 Cyhenopodium album, 0.33 Solanum nigrum, 0.25 Amaranthus retraflexus, 0.20 Portulaca oleraceae, totaling 2.51 units/m2. In this variant, the presence of perennial weeds was taken into account: 0.15 Sorghum halepense, 0.18 Convolvulus arvensis, totaling 0.33 units. This pattern between the variants was maintained in the subsequent calculation period. Data on calculations after 2-3 irrigations of weeds are presented in Table 3.1.2.
Similar data on the effect of herbicides on weed species were obtained in subsequent years of scientific research. The average data on the effectiveness of herbicides in 2021-2023 are presented in Table 3.1.3. The Stop Bek 33% s.c. preparation, when applied at rates of 1.0; 1.35 and 1.75 l/ha, reduced annual weeds by 82.9; 88.1; and 89.9%, respectively, in the first accounting period. In the second accounting period, these indicators were 80.9; 86.3 and 87.8%, respectively, and in the third accounting period, 78.4; 85.0 and 85.8%. In the variant where Stop Bek 33% s.c. (1.35 l/ha) and Zelek Bek 10.8 % s.c. (0.7 l/ha) were applied first and then, this indicator was higher, equal to 87.3-93.5 % during three calculations.
When considering the effect of herbicides on perennial weeds, Stomp 33 % s.c. and Stop Bek 33 % s.c. herbicides affected only the seedlings of these weeds. In this case, the number of perennial weeds in the control variant was 4.00-4.56 units/m2, while in the variant where Stomp 33% s.c. herbicide was used, their number was 3.23-3.98 units/m2, which was 13.1-19.2% less than in the control.

Journal Zone Publishing, Ilford, United Kingdom

In the variants where Stop Bek 33% s.c. herbicide was used at rates of 1.0; 1.35; 1.75 l/ha, their number was 8.28-10.4; 14.2-19.2; and 15.7-20.4% less, respectively. When using the herbicide Zellek super 10.4% s.c. (1.0 l/ha), perennial weeds were reduced by 82.1-86.2%. When using the herbicides Stop Bek 33% s.c. (1.35 l/ha) and Zelek Bek 10.4% s.c. (1.0 l/ha) one after the other, the number of annual weeds was reduced by 87.3-93.5%, and perennial weeds by 87.2-91.7%.

Table 3.1.2 Impact of herbicides on weed species, pcs/m2, 2nd account (2021-2023)

No	Options	Herbicide rate, l/ha	Annual weeds						Perennial weeds		
			Echinochloa crusgalli	Cyhenopodium album	Solanum nigrum	Amaranthus retraflexus	Portulaca oleracea	Total	Sorghum halepense	Convolvulus arvensis	Total
1.	Control, without herbicide	-	13.8	5.48	3.81	3.51	2.58	29.3	3.06	1.28	4.34
2.	Stomp, 33 % s.c.	1.5	2.26	0.93	0.58	0.5	0.35	4.63	2.52	1.18	3.70
3.	Stop Bek, 33 % s.c.	1.0	2.56	1.13	2.15	0.66	0.46	5.55	2.71	1.22	3.93
4.	Stop Bek, 33 % s.c.	1.35	1.98	0.8	0.51	0.41	0.28	4.0	2.49	0.40	3.53
5.	Stop Bek, 33 % s.c.	1.75	1.63	0.73	0.45	0.38	0.25	3.45	2.43	1.10	3.53
6.	Zellek-super, 104 g/l s.c.	1.0	6.31	3.58	2.41	1.81	1.50	15.6	0.26	0.43	0.70
7.	Zelek Bek, 10,8 %	0.5	6.43	3.73	2.51	1.88	1.6	16.1	0.43	0.56	1,0
8.	Zelek Bek, 10,8 % s.c.	0.7	6.1	3.48	2.38	1.73	4.4	15.1	0.26	0.36	0.62
9.	Zelek Bek, 10,8 % s.c.	1.0	5.76	3.26	2.16	1.55	1.31	14.0	0.21	0.33	0.54
10.	Stop Bek + Zelek Bek	1.35+0.7	1.31	0.63	0.38	0.28	0.21	2.83	0.20	0.28	0.48

In the standard variant, where Stomp, 33% s.c., herbicide was applied at a rate of 1.5 l/ha, the number of annual weeds was reduced by 83.0-86.0%. This herbicide had a very weak effect on perennial weeds. The efficiency in this variant was 13.1-19.2 5 %.

When Stop Bek 33% s.c. was used at a rate of 1.0 l/ha, the efficiency was relatively low, amounting to 78.4-82.9 %. When this drug was applied at rates of 1.35 and 1.75 l/ha, the number of annual weeds was reduced by 85.0-88.1 and 85.8 and 89.9 %, respectively. Stop Bek 33% s.c. preparation, when applied at rates of 1.35 and 1.75 l/ha, reduced perennial weeds by 14.2-19.2 and 15.7-20.4 %, respectively.

Zellek-super, 10.4 % herbicide, when applied after the first watering of the goose at a rate of 1.0 l/ha, reduced perennial weeds by 82.1-86.2 %. This preparation reduced annual weeds by 39.2-66.2 %. Zelek Bek, 10.8 % herbicide, when applied after the first watering of the goose at rates of 0.5; 0.7; 1.0 l/ha, reduced perennial weeds by 74.4-80.8; 83.9-87.9 and 85.4-89.2 % were lost. This drug had a good effect on annual weeds growing at the time of spraying. However, the effect on those that sprouted from seeds was low. In these three options, the number of annual weeds decreased by 38.4-63.9; 43.2-68.9 and 46.9- 73.8 %, respectively.

In the option where Stop Bek 33% s.c. (1.35 l/ha) and Zelek Bek 10.8 % s.c. (0.7 l/ha) herbicides were applied first and then, annual weeds were lost by 87.3-93.5 %, and perennial weeds were lost by 87.2-91.7 %.

Journal Zone Publishing, Ilford, United Kingdom

Thus, Stop Bek 33% s.c. and Zelek Bek 10.8% s.c. herbicides, when applied separately and sequentially at acceptable rates, effectively destroy annual and perennial weeds.

To correctly assess the effectiveness of weed control measures, it is necessary to determine the dry mass of weeds. In field experiments, the dry mass of annual weeds during the 1st calculation was on average 30.2 g/m2 in the control (without herbicide) variant. While in the variant where Stomp herbicide was used, it was found to be 4.22 g/m2, which was 83.8-86.0% less than the control variant. Stop Bek 33% s.c. herbicide 1.0; When applied at rates of 1.35 and 1.75 l/ha, the dry mass of annual weeds was reduced by 80.5-83.2; 86.0-89.0 and 86.8-90.0 %, respectively.

Zelek Bek 10.8 % s.c. herbicide when applied at rates of 0.5; 0.7 and 1.0 l/ha reduced the dry mass of perennial weeds by 77.5-82.2; 83.8-87.5 and 85.4-92.7 %, respectively. The effectiveness of this drug was somewhat lower than that of annual weeds (34.5-64.8; 37.2-70.3; 41.5-75.8 %).

Table 3.1.3 Impact of herbicide use on weeds (average 2021-2023)

No.	Annual weeds						Perennial weeds					
	Account 1		Account 2		Account 3		Account 1		Account 2		Account 3	
	pcs/ m^2	decrease- %	pcs/ m^2	decrease- %	pcs/ m^2	decrease- %	pcs/ m^2	decrease- %	pcs/ m^2	decrease- %	pcs/ m^2	decrease- %
1.	38.5	-	29.3	-	24.4	-	4.0	-	4.35	-	4.56	-
2.	5.26	86.0	4.63	84.0	4.13	83.0	3.23	19.2	3.71	14.7	3.98	13.1
3.	6.45	82.9	5.55	80.9	5.18	78.4	3.58	10.4	3.94	9.39	4.18	8.28
4.	4.41	88.1	4.00	86.3	3.65	85.0	3.23	19.2	3.62	16.7	3.91	14.2
5.	3.76	89.9	3.45	87.8	3.38	85.8	3.18	20.4	3.54	18.6	3.85	15.7
6.	12.8	66.2	15.6	46.2	14.6	39.2	0.55	86.2	0.7	83.9	0.81	82.1
7.	13.9	63.2	16.0	44.8	14.8	38.4	0.75	80.8	1.0	77.0	1.16	74.4
8.	11.9	68.9	15.2	48.2	13.7	43.2	0.48	87.9	0.63	85.4	0.73	83.9
9.	10.1	73.8	14.0	52.0	12.8	46.9	0.43	89.2	0.55	87.4	0.66	85.4
10.	2.51	93.5	2.83	90.4	3.11	87.3	0.33	91.7	0.48	88.9	0.58	87.2

In the variant where Stop Bek 33 % s.c. (1.35 l/ha) and Zelek Bek 10.8 % s.c. (0.7 l/ha) were applied sequentially, the dry mass of annual weeds was effectively reduced by 88.2-93.3%. While the dry mass of perennial weeds was 4.33-5.58 g/m2 in the control variant, in the variants where Stomp 33 % s.c. 1.5 l/ha and Stop Bek 33 % s.c. herbicides were applied at a rate of 1.35 l/ha, their dry mass was reduced by 15.6-22.0 and 15.7-23.1%, respectively. When Stop Bek 33% s.c. (1.35 l/ha) and Zelek 10.8% s.c. (0.7 l/ha) herbicides were applied sequentially, the dry mass of weeds was 0.31-0.65 g/m2, which was an 88.2-92.7% reduction in the dry mass of perennial weeds compared to the control option.

Journal Zone Publishing, Ilford, United Kingdom

3.2. Cotton yield

The use of herbicides against weeds at optimal rates effectively reduces annual and perennial weeds in a timely manner, creating favorable conditions for the growth and development of cotton. This ensures increased cotton yields.

Table 3.2.1 Cotton yield, q/ha (2021-2023)

No	Options	2021 year	2022 year	2023 year	Medium q/ha	Out of control difference
1.	Control, without herbicide	29.7	33.8	34.5	32.7	-
2.	Stomp, 33 % , 1,5 l/ha	32.8	37.0	37.8	35.9	+3.2
3.	Stop Bek, 33 % 1,0 l/ha	31.9	36.1	36.7	34.9	+2.2
4.	Stop Bek, 33 % 1,35 l/ha	33.8	38.0	38.9	36.9	+ 4.2
5.	Stop Bek, 33 % 1,7 l/ha	32.1	36.4	37.5	35.3	+2.6
6.	Zellek-super,104 g/l, 1,0 l/ha	32.8	37.0	37.5	35.8	+3.1
7.	Zelek Bek, 10,8 % 0,5 l/ha	32.2	36.5	37.1	35.3	+2.6
8	Zelek Bek, 10,8 % 0,7 l/ha	33.1	37.4	38.3	36.3	+ 3.6
9.	Zelek Bek, 10,8 % 1,0 l/ha	32.6	36.9	37.7	35.7	+3.0
10.	Stop Bek, + Zelek Bek, 1,35+ 0,7 l/ha	35.1	39.4	40.3	38.3	5.6

The mass of cotton in one boll was 4.7 grams in the control variant. When Stomp, 33%, 1.5 l/ha, Stop Bek, 33% was applied at a rate of 1.35, it was 4.9 grams. When Stop Bek herbicide was applied at a rate of 1.35 l/ha, and Zelek Bek was applied at a rate of 0.7 l/ha, it was 5.0 grams.

The three-year average data on yield are presented in Table 3.2.1. In the control variant without herbicides, a cotton yield of 32.7 q/ha was obtained. In the variant where Stomp, 33% herbicide was applied at a rate of 1.5 l/ha, a cotton yield of 3.2 q/ha was obtained compared to the control.

In the variant where Stop Bek, 33%, was used at a rate of 1.0 l/ha, the yield was 34.9 q/ha, which was an additional yield of 2.2 q/ha compared to the control. When Stop Bek herbicide was used at a rate of 1.35 l/ha along with sowing, the cotton yield was 36.9 q/ha, which was 4.2 q/ha more than the control.

In the variant where Zellek-super, 104 g/l, was used at a rate of 1.0 l/ha, the additional yield was 3.0 q/ha compared to the control. In the variant where Zelek Bek was used at a rate of 0.5 l/ha, the yield was 35.3 q/ha, which was 2.7 q/ha more than the control. When this preparation was applied at a rate of 0.7 l/ha, the cotton yield was 36.3 q/ha per hectare, which was 3.6 q/ha more cotton than the control. When this preparation was applied at a rate of 1.0 l/ha, the yield was 35.7 q/ha, and the additional yield compared to the control was 3.0 q/ha.

When Stop Bek, 33%, was applied at a rate of 1.35 l/ha, and Zelek Bek was applied at a rate of 0.7 l/ha, the cotton yield was 38.3 q/ha. The additional yield compared to the control was 5.6 q/ha.

Journal Zone Publishing, Ilford, United Kingdom

4. CONCLUSIONS

Thus, Stop Bek herbicide, when used together with seed sowing at a rate of 1.35 l/ha, and Zelek Bek preparation, when used separately after the first irrigation of the seedling at a rate of 0.7 l/ha, reduces weeds and ensures higher cotton yields. When these preparations are used sequentially at the above rates, they effectively reduce annual and perennial weeds and ensure higher cotton yields by 5.6 q/ha.

REFERENCES

1. Доспехов Б.А. Методика полевого опыта. М.: Агропромиздат 1985. с.230-240. (In Russian language)
2. Жарасов Ж.Ш. Агроэкологические аспекты применения гербицидов под озимую пшеницы на богаре юго-востока Казахстана. Автореферат канд. диссертации. Алмаата, 2002 с. 17. (In Russian language)
3. Nurmatov Sh. va boshqalar. Dala tajribalarini o‘tkazish uslublari. O‘zPITI, T. 2007. b. 1-146. (In Uzbek language)
4. Makhkam Shodmanov. Efficiency of application of a combination of herbicides against weeds in cotton crops. Ann. For. Res. 65(1): 10741-10750, 2022 ISSN: 18448135, 20652445 Annals of forest research https://www.e-afr.org/ © ICAS December 2022.

Journal Zone Publishing, Ilford, United Kingdom