

RESULT OF APPLICATION OF HERBICIDES FOR CONTROLLING THE WEEDS IN WHEAT FIELD

T. Azzaya, M. Otgonsuren

Plant Protection Research Institute

e-mail: otgonsuren555@yahoo.com

ABSTRACT

According to weed distribution research outputs have been recorded 13 species belonging to 12 genera of 11 families in the wheat fields of Nart-1 center in Bornuursoum of Tuvaimag, among them, annuals for 68.5%, biennials for 14.7% and perennials for 16.8% were estimated. The application of herbicides such as Penizan, Zinger, Lornet, Ovsygen express, Penizan+Ovsygen express and Zinger+ Ovsygen for controlling both grassy and dicotyledonous weeds has *Chenopodium album* L, *Polygonum convolvulus* L, *Panicummiliaceum* L, *Avenafatua* L, *Setariaviridis* L, *Cannabis ruderalis*, *Fagopyrumtataricum* L, *Chenopodiumaristatum* L, *Salsolacollina* (Pall) , *Amaranthusretroflexus* L, *Silenerrepens* Patr, *Potentillabifurca* L, *Geranium sibiricum* L, *Agropyronrepens* L, *Noneopulla* L, *C Linariaburiatica* (Turcz), *Potentillaanserina* L, *Artemisia sieversiana* Willd, *Plantago major* L, *Taraxacumofficinale* Wigg, *Medicagofalgate* L were shown 87.5-100% technical effectiveness.

KEY WORD: Technical effectiveness, herbicide, weed

INTRODUCTION

As a result of measures applied within the framework of “Third National Crop Rehabilitation Drive” by the government of Mongolia, such activities as protection of soil fertility, intensification of controlling weeds by chemical methods, and introduction of advanced technologies for land working are now being successfully accomplished. Therefore, transition of our country into market economy, followed by decrease of production sphere of economic entities requires bringing plant protection activities onto new stage in current contexts, minimizing crop production loss and improving the product quality via introduction of advanced technologies used

worldwide. It has been essentially important to use the newest highly specific herbicides for the fallow-crop rotation.

In last year's, use of sole herbicide for controlling weeds on grain crop fields is avoided and instead, the combination of many new specific herbicides adjusting for the country's soil and climatic features has been necessary. Controlling measures are implemented in association with specific soil and climatic conditions of our country, shorter period of growth, droughts and aridity during spring and summer, and species composition of weeds.

MATERIALS AND METHODS

Distributions and density of weeds on the wheat fields were used the methods of I.I.Libershtein and A.A.Tulikov. Technical effectiveness of herbicide for each weed species was precisely estimated using 1 m² frame at days 3, 7, 14 and 21 before and after

herbicide use, and those plants affected by the herbicide were recorded and estimated. Changes of soil microorganisms were determined in accordance to their variants using methods described by K.Ulykpan and B.Bayartogtokh.

RESULTS OF THE STUDY

In average, 28-69 individual weeds per 1 m² were counted, among them 13 species weeds, belonging to 12 genera of 11 families were recorded. Considering to species rate, 17.1% *Panicummiliaceum L*, 16.2% *Chenopodium album L*, 15.2% *Setariaviridis L*, 14.7% *Artemisia sieversianaWilld*, 6.9% *Avenafatua L*, 5.7% *Polygonum convolvulus L*, 4.7% *SilenerepensPatr*, 5.4% *Fagopyrumtataricum*

L, 4.2% *Agropyronrepens L*, 3.5% *Potentillabifurca L*, 1.2% *Cannabis ruderalisL*, 1.8% *ViciaamoenaFisch*, 0.8% *Geranium sibiricum L*, 1.3% *Convolvulus arvensis L*, 1.1% *Noneapulla L*, and 0.2% *Viciacracca L* 17.1% of these weeds were estimated. Annuals, biennials and perennials account for 68.5%, 14.7% and 16.8% respectively of the recorded weeds.

The biological groups of weeds presented in wheat fields

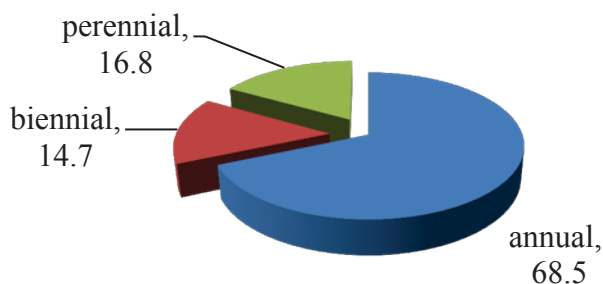


Figure 1. Ratio of biological groups of weeds

Each of herbicides made in Russia such as Penizan, Zinger, Lornet, Ovsygen express, which are specific to growth stages from filleting to shooting, on wheat planted fields, were used solely in various doses against annual grasses and

dicotyledonous weeds, while combinations of herbicides Penizan+Ovsygenexpress and Zinger+Ovsygenexpress were used for controlling all weeds, and combinations of herbicides have with 93,15-100% technical effectiveness.

Technical effectiveness of herbicides , % /wheat/

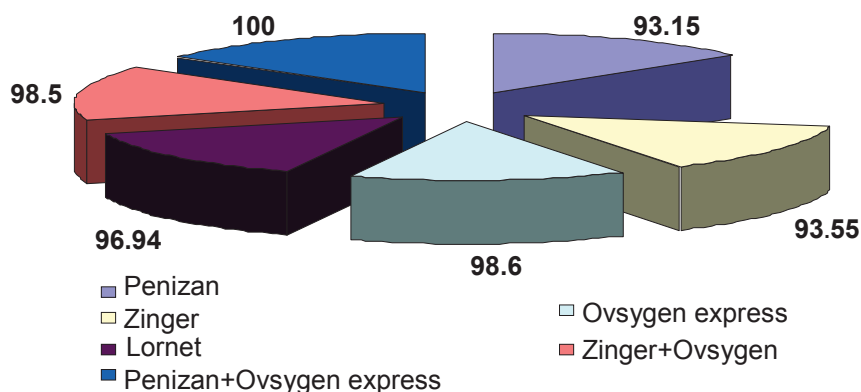


Figure 2. Technical effectiveness of herbicides

Above herbicides can be broadly used for controlling weeds distributed on crop fields of our country.

Number of microorganisms contained in 0-10 cm deep layers of soil at days 25-30 after use of above herbicides on wheat fields was determined, and principles of relationships between them were estimated and summarized in the table.

Despite the use of herbicides for controlling weeds on wheat fields resulted in killing and decreasing the weeds, total count of soil microorganisms was not reduced. But increase of soil micro organisms is probable due to multiplication of their total number as a result of increased microorganisms per unit of area after drop of weeds number. Thus increase of the number of beneficial microorganisms in soil exerted effects on the crop production.

Table 1

Herbicides	No. of total microorganisms /CFU/	No. of bacteria /CFU/	No. of actinomycetes /CFU/	No. of micro fungi /FCU/
Control	13.1x10 ⁸	2.9x10 ⁸	4.5x10 ⁵	5.7x10 ⁵
Penizan	15.0x10 ⁸	4.4x10 ⁸	6.7x10 ⁵	3.9x10 ⁵
Zinger	19.0 x10 ⁸	4.5x10 ⁸	5.6x10 ⁵	8.9x10 ⁵
Magnum	17.8x10 ⁸	3.4x10 ⁸	5.7x10 ⁵	8.6x10 ⁵
Ovsygen express	17.9x10 ⁸	3.6x10 ⁸	5.6x10 ⁵	8.7x10 ⁵
Penizan+Ovsygen express	17.4x10 ⁸	3.9x10 ⁸	7.9x10 ⁵	5.6x10 ⁵
Zinger+Ovsygen express	18.3x10 ⁸	3.8x10 ⁸	6.7x10 ⁵	7.7x10 ⁵

During period from filleting to shooting, use of Penizan herbicide against dicotyledonous weeds at the dosage of 0.14-0.20 l per ha field decreased the number of weeds by 93.8-96.7%, increased crop production by 2.34-2.74 center, while use of Zinger at the dosage of 8-10g/ha

decreased weeds by 96.2-97.1% and increased crop by 1.27-3.54 centner. Variant using Ovsygen express against grassy annual weeds at the dosage of 0.3-0.5 l/ha decreased weeds by 98.6-100% and increased crop production by 0.74-2.6 centner.

Table 2

No	Variants	Herbicide dosage, /l/ha/	Average production, centner/ha	Increased crop production	
				centner/ha	%
1.	Control	0	8.6	-	-
2.	Penizan	0.14	11.34	2.74	31.86
		0.20	10.94	2.34	27.21
3.	Zinger	8	8.4	-	-
		10	9.2	0.6	6.98
4.	Penizan+Ovsygen express	0.17+0.5	9.2	0.6	6.98
5.	Zinger+Ovsygen express	8+0.5	9.47	0.87	10.12
6.	Lornet	0.16	9.34	0.74	8.61
		0.66	9.74	1.14	13.26
7.	Ovsygen express	0.3	10.74	2.14	24.89
		0.5	11.20	2.6	30.24

DISCUSSION

Broader use of specifically acting herbicides in the technology for improvement of minimum tillage technology, transition into zero tillage crop production system, and introduction of technology without chemical and mechanical tillage for controlling the weeds will assist to

reduce the density of weeds and limit their numbers. Therefore international organizations authorize to ensure optimal management of chemical use worldwide and upgrade the controls of these chemicals for crop production development.

CONCLUSION

1. Of 28-69 individual weeds per 1 m² in average, 13 species weeds, belonging to 12 genera of 11 families were recorded in fallow-wheat fields of Nart center in Bornuursoum, Tuvaimag, and annuals, biennials and perennials account for 68.5%, 14.7% and 16.8% respectively of the weeds.
2. Use of Penizan, Zinger, Lornet, Penizan+Ovsygen express and Zinger+Ovsygen express for controlling dicotyledonous weeds has 93.15-100% technical effectiveness, while use of Ovsygen express for controlling grassy annual weeds has 98.6% effectiveness.
3. Herbicides such as Penizan Zinger, Lornet, Ovsygenexpress were used at the various

dosages, number of microorganisms living in upper layers of soil was measured, and principles of their relationships were determined.

4. The use of Penizan herbicide against dicotyledonous weeds at the dosage of 0.14-0.20 l per ha field decreased the number of weeds by 93.8-96.7%, increased crop production by 2.34-2.74 center, while use of Zinger at the dosage of 8-10 g/ha decreased weeds by 96.2-97.1% and increased crop by 1.27-3.54 centner. Variant using Ovsygen express against grassy annual weeds at the dosage of 0.3-0.5 l/ha decreased weeds by 98.6-100% and increased crop production by 0.74-2.6 centner.

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