

EFFECT OF HERBICIDES APPLIED AGAINST OF WEEDS IN SOYBEAN (*GLYCINE MAX* L.) FIELD

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ABSTRACT

Herbicides, if used properly, are safe and effective in controlling weeds in soybean. The choice of herbicide, however, depends on the predominant weed species and the availability of the herbicide.

In soybean field distributed 21 species of weeds of 20 genus belonging to 14 families, that are determined 71.5% annual, 9.5% biennial weeds and 19.0% perennial weeds. Herbicides are available for pre-emergence or post emergence weed control in soybean. For examining testable variations, 278 weeds in 1m² area were counted a wet weight 1000 g, a dry weight 138.1 referring to weed density at the highest doses 1.5-2.0 L of Targon herbicide applied in variations, whereas 92 weeds in 1m² area were counted a wet weight 575 g, a dry weight 120.1 were to rubbish most lesser Gallant super herbicide doses at 0.45-0.65 L/ha applied in variations. In soybean field for controlling to weeds were applied Targon herbicide at doses 1.0-2.0 l/ha, whereas weed species density reduced by 91.4-93.2% and the weight by 47.2-59.7%, Gallant super herbicide at doses 0.45-0.65 l/ha, the weed species density reduced by 91.1-96.3, and the weight by 37.3-58.9%, Cobra herbicide at doses 0.45-0.55 l/ha that weed species density reduced by 90.2-95.0% and the weight by 36.7-41.4%, Flex herbicide at doses 1.65-1.85 l/ha that weed species density reduced by 95.6-94.6% and the weight by 31.2-32.5 percent respectively.

The effect of chemical weed control with reduced herbicide doses on the weed population density in soybean yield was observed. Weed competition has reduced an important morpho-physiological trait in soybean.

KEYWORDS: Herbicide, Targon, Gallant super, Cobra, Flex, weed density; weed biomass, weed control; soybean yield

INTRODUCTION

Soybeans are packed full of vitamins, fiber and protein. They are adaptable to many recipes, produce excellent oil and can be ground to make soy milk. For this reason soybeans are valued by not just vegetarians and people who cannot afford meat, but also health conscious individuals looking to an alternative to meat proteins.

Soybean has an average protein content of 24-28% and is more protein-rich than any of the common

vegetable or animal food sources found in Mongolia. The soybean can take a good preceding crop in the crop rotation of our country and to enrich the soil. However, in certain countries there are small farmers who grow this leguminous crop in rotation with the aim of nitrogen enrichment of the fertile soil and to obtain fodder for animal nutrition. In common with beans, soybean does not tolerate weed competition at early growth

stages. Uncontrolled weeds not only reduce soybean yields through their competition for light, nutrients, and moisture, but they can also severely reduce harvest efficiency. Before implementing a weed management plan for soybeans, several

factors need to be considered including weed species, rotational crops, and cost. Some weed seeds are also difficult to remove from harvested broadleaf weed seeds, reducing the quality of harvested seed.

OBJECTIVES

Soybean is among the major industrial and food crops grown in every continent. For this reason in soybean growing area essential to increase, to ensure soy is the highest quality, most dependable, sustainable and competitive in the global marketplace, and thus to protect them from diseases, insects and weeds, to apply non – toxic chemical substances to human health and environment.

Our research purpose is to develop weed controlling method suited to weeds biological characteristics in soybean field.

Objectives for this research work were to:

- Define of weed distribution, density and weed species composition.
- Determine proper type, dose, spreading time of herbicides with weed control in soybean field.

Sstudy the effect of herbicides and crop weed competition on soybean yield

MATERIALS AND METHODS

Research work executed in the experimental and flow – production field of Plant Science and Agricultural Research Institute, Plant genetic resources laboratory in Orkhon sum, Darhan-Uul province.

1. We have determined the distribution and density of weed in soybean field by using N.N.Liberstein and A.M.Tulicov's methods.
2. Experimental result was calculated on 7th, 14th, 21st days before and after

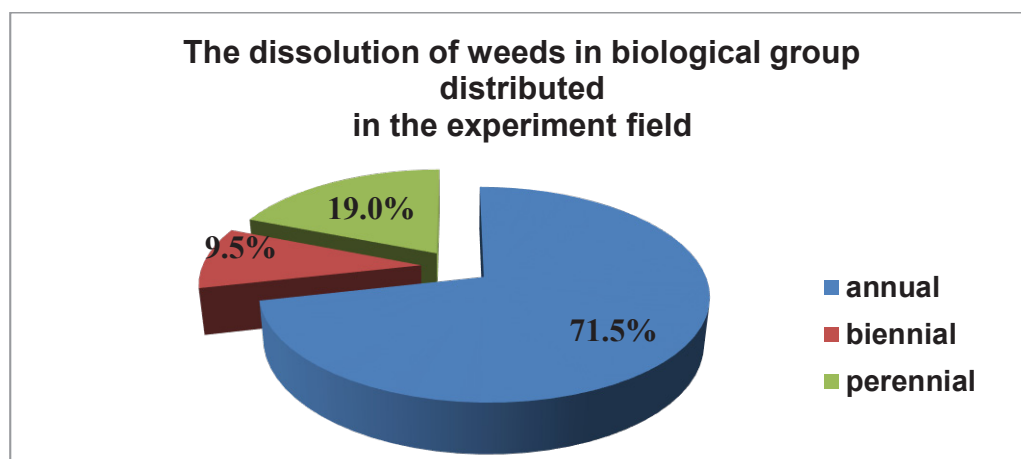
application herbicide in every selected plot sized 1 square meter in frame. The weeds in every frame were conducted a census and classified into biological groups.

3. The sample of weed biomass to determine for 4 replications apiece variation to make snip-snap at 3 to 4 cm high of weed for above ground, in each case of plant to differentiate weighting 1 square meter in frame weeds.

RESULTS OF RESEARCH

In soybean field distributed 21 species of weeds of 20 genus belonging to 14 families, that are determined 71.5% annual, 9.5% biennial and 19.0% perennial weeds. For example; Common millet- (*Panicummiliaceum*), Couch grass- (*Agropyronrepens L*), Green Bristlegrass- (*Seteriaviridis L*) Redroot Pigweed- (*Amaranthusretroflexus*), lambsquarters- (*Chenopodium album*), Aristate Goosfoot- (*Chenopodiumaristatum L*), Black bindweed- (*Polygonum convolvulus*), Mallow weed- (*Malvamochileviensis Down*), Field bindweed- (*Convolvulus arvensis*), Bristly thistle-

(*Cirsiumsetosum*), Dwarf bifurcate cinquefoil - (*Potentillabifurca*), Perennial Sowthistle- (*Sonchusarvensis L*) are main weeds distributed in soybean fields. In ratoon cane, other species are predominated such as Common millet- (*Panicummiliaceum*), lambsquarters- (*Chenopodium album*) and Redroot Pigweed- (*Amaranthusretroflexus*). On an average, 180-290 weeds in 1m² area were counted in the experimental and flow – production field of Plant genetic resources laboratory in Orkhon sum, Darhan-Uul province. (chart 1.)



In soybean field for 4 replications apiece variation of weed biomass sample to make snip-snap at 3 to 4 cm high of weed for above ground,

in each case of plant to differentiate weighted 1 square meter in frame weeds were conducted a census and classified into biological groups.

Table 1

Variation of herbicides	Herbicide dose l/ha	Number of weeds in 1m ² square /piece/	Weeds density and biomass in the experimental field		
			Weight of weeds 1m ² square /g /		
			wet weight	dry weight	Percent /%/
Control	-	304	1210	292.7	-
Gallant super	450	133	735	154.4	47.2
	550	162	590	117.7	59.7
	650	92	575	120.1	58.9
Targon Cobra	1.5	148	680	223.2	23.7
	2.0	278	1000	138.1	52.8
	450	256	710	171.5	41.4
	500	247	715	182.4	37.6
	550	212	720	185.2	36.7

For examining testable variations: 278 weeds in 1m² area were counted a wet weight 1000 g, a dry weight 138.1 referring to weed density at the highest doses 1.5-2.0 L of Targon herbicide applied in variations, whereas 92 weeds in 1m² area were counted a wet weight 575 g, a dry weight 120.1 were to rubbish most lesser Gallant super herbicide doses at 0.45-0.65 L/ha applied in variations.

Therefrom equilibration biomass with high broadleaf weeds are distributed predominately, Cobra (lactofen) herbicide doses at 0.45-0.55 L/ha were applied for postemergence control of many broadleaf weeds, including Perennial Sowthistle. Cobra is a contact action herbicide requires thorough spray coverage for good weed control. Soybean beyond the third trifoliolate leaf stage may interfere with the spray pattern and reduce the weed coverage.

including common lambsquarters, black bindweed, mallow weed, common pigweed species, field bindweed, perennial Sowthistle in soybean field.

Targon (quizalofop-ethyl) herbicide doses at 1.5-2.0 L/ha and Gallant super (Haloxyp-P-methyl) doses at 0.45-0.65 L/ha have been applied for post emergence control of annual grasses and quack grass regrowth should be retreated at 10 to 15 cm high.

Flex (fomesafen) herbicide applied for postemergence at 1.65 -1.85 L/ha that controls common the cocklebur, common lambsquarters, black bindweed, mallow weed, common pigweed species, field bindweed, and common Sowthistle. Apply to annual broadleaf weeds in the 2 to 4 inch stage, very susceptible weeds such as common lambsquarters and pigweeds will turn yellow in 3 to 5 days, growth stops and they die within 7 to 21

days. Other grasses weeds will remain green but stunted.

Table 2

Effect of herbicides applied for controlling the weeds in soybean field

Number	Variation of herbicides	Herbicides doses l/ha	Reduction of weed to spray				Compared to control	
			before piece/M ²	after p/M ²	number p/M ²	per	weight g/M ²	per
1.	Control	Not herbicide	248	364	-	-	292.7	
2.	Gallant super	0.45	181	16	165	91.1	120.1	58.9
		0.55	243	9	234	96.3	183.6	37.3
		0.65	222	11	211	95.0	138.1	52.8
3.	Cobra	0.45	164	16	148	90.2	171.5	41.4
		0.50	228	14	214	93.8	182.4	37.6
		0.55	177	9	168	95.0	185.2	36.7
4.	Targon	1.5	235	16	219	93.2	154.4	47.2
		2.0	187	16	171	91.4	117.7	59.7
5.	Flex	1.65	365	16	349	95.6	201.4	31.2
		1.85	279	15	264	94.6	197.3	32.5

In soybean field for controlling to weeds were applied Targon herbicide at doses 1.0-2.0l/ha, whereas weed species density reduced by 91.4-93.2% and the weight by 47.2-59.7%, Gallant super herbicide at doses 0.45-0.65 l/ha, the weed species density reduced by 91.1-96.3, and the weight by 37.3-58.9%, Cobra

herbicide at doses 0.45-0.55 l/ha that weed species density reduced by 90.2- 95.0% and the weight by 36.7-41.4%, Flex herbicide at doses 1.65-1.85 l/ha that weed species density reduced by 95.6-94.6% and the weight by 31.2-32.5 percent respectively.

Comparing to the effect of variations of applied herbicides in soybean field, Gallant super herbicide at 0.45-0.65 l/ha doses, where the yield amount were increased by 2.9-5.0 centner, Cobra herbicide at 0.45-0.55 l/ha doses by 0.7-2.3 centner, Targon at 1.0-2.0l/ha doses by 2.6-3.3 centner, Flex herbicide at 1.65-1.85L\ha doses by 1.3-1.5

center hectare respectively. From seeing the above mentioned results, the soybean yield is depending directly on following factors are a present year total seasonal time of applied herbicide, soil fertile, distribution of precipitation and an active heat amounts.

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