

RESULT OF HERBICIDES APPLIED AGAINST OF WEEDS IN SOYBEAN 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. Chemical control is currently the most widely used control for soybean crops, due to its ease of control and to the small areas planted in Mongolia.

*In the soybean field the 15 species of weeds belonging to 9 families, 12 genus including 62.5 % annual, 37.5% perennial weeds are distributed. The major grassy weeds; Common millet-(*Panicummiliaceum* L), Couch grass-(*Agropyronrepens* L), Bristlegrass-(*Seteriaviridis* L) sp and broadleaved weeds 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) weeds have been distributed in the soybean field. In soybean field the Forward herbicide were applied in doses of 1.0-1.2l/ha have reduced the number of weeds by 90.1-91.6%, weight by 59.5-66.1% and super herbicide Gallantsuper applied in doses of 0.45-0.65l/ha have reduced the number of weeds by 91.0-95.0%, weight by 39.5-59.8% while Cobra herbicide applied in doses of 0.45-0.55l/ha used in broadleaved weed distributed field, have reduced the number of weeds by 90.2-94.6% and weight by 42.7-50.7%. The herbicide application increased of yield hectar by 3.6-9.0 center.*

KEYWORDS: Herbicides; Forward, Gallantsuper, Cobra, weed density; weed biomass, weed control; 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 agriculture rotation of our country and to enrich the soil. The crop can be successfully grown in Mongolia using low agricultural inputs.

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.

The purpose of this study was to determine the composition of weed flora of soybean field and

their chemical control effectiveness through the application of herbicides.

Objectives for this research work were to:

- Define of weed distribution, density and weed species composition.
- Determine proper type, dose, spraying time of herbicides with weed control in soybean field.
- Study the effect of herbicides and crop weed competition on soybean yield.

MATERIALS AND METHODS

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

-Here were used N.N.Liberstein and A.M.Tulicov's methods for defining the distribution and density of weed in soybean field.

-Experimental result calculated before and after 7, 14, 21 days for application herbicide in every selected weed 1 square meter in frame.

The weeds in every frame were conducted a census and classified into biological groups.

-Dry matter of weeds was recorded at three stages namely 20, 40 and 60 days after sowing. 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.

-Weed density count per square meter were taken by randomly placing two 0.5m² quadrants in the middle five rows of each plot. Soybean yields were taken at maturity.

RESEARCH RESULT

In the soybean field the 15 species of weeds belonging to 9 families, 12 genus including 62.5 % annual, 37.5% perennial weeds are distributed. The major grassy weeds; Common millet- (*Panicum miliaceum* L), Couch grass- (*Agropyron repens* L), Bristlegrass- (*Setaria viridis* L) sp and broadleaved weeds Redroot Pigweed- (*Amaranthus retroflexus*), lambsquarters- (*Chenopodium album*), Aristate Goosfoot- (*Chenopodium aristatum* L), Black bindweed- (*Polygonum convolvulus*),

Mallow weed- (*Malva moschata* L), Field bindweed - (*Convolvulus arvensis*), Bristly thistle- (*Cirsium setosum*), Dwarf bifurcate cinquefoil - (*Potentilla bifurca*), Perennial Sowthistle- (*Sonchus arvensis* L) weeds have been distributed in the soybean field. For average 180-290 weeds in 1m² square were counted in the experiment – production field of Plant genetic resources laboratory in Orkhon sum, Darhan-Uul province.

Table 1

Weed density, biomass and effect of the herbicide applied in soybean field

Variant of Herbicides	Doses of herbicides l/ha	Number of weeds in 1m ² square /piece/			Weight of weeds 1m ² square /g /						Reduction of weed effectiveness	
		annual	perennial	Total	wet weight			dry weight			weight of weed, %	number of weed, m ²
					annual	perennial	total	annual	perennial	total		
Control	0	301	3	304	650.2	559.8	1210	182.0	110.7	292.7	-	-
Gallant	0.45	118	15	133	528.4	206.6	735	98.0	56.4	154.4	59.8	91.0
super, 10.8%	0.55	158	4	162	427.5	162.5	590	88.7	29.0	117.7	42.3	94.3
	0.65	86	6	92	328.1	246.9	575	75.2	44.9	120.1	39.5	95.0
Cobra, 24%	0.45	146	2	148	436.9	243.1	680	101.5	121.7	223.2	42.7	90.2
	0.5	265	13	278	641.5	358.5	1000	89.0	49.1	138.1	44.8	93.1
Forward, 60g/l	0.55	244	14	256	428.6	281.4	710	106.4	65.1	171.5	50.7	94.6
	1.0	238	9	247	426.2	288.8	715	109.7	72.7	182.4	59.5	91.6
	1.2	209	3	212	424.3	285.7	720	110.4	74.8	185.2	66.1	90.1

2010S_x: 0.70 , NCP_{0.5}: 2.082011S_x: 1.46, NCP_{0.5}: 4.362012 S_x:1.33, NCP_{0.5}: 3.96

For examining testable variations 278 weeds in 1m² square were counted wet weight 1000 g, dry weight 138.1 to belong of weed density most more Cobra herbicide doses at 0.45-0.55L applied in variants, whereas 92 weeds in 1m² square were counted wet weight 575 g, dry weight 120.1 were to rubbish most lesser Gallantsuperherbicide doses at 0.45-0.65 L/ha applied in variations. Therefrom equilibration biomass with high broadleaf weeds to distributed predominate connected, including common lambsquarters, black bindweed, mallow weed, common pigweed species, field bindweed, perennial Sow thistle in soybean field.

Forward (quizalofop-ethyl)herbicide doses at 1.0-1.2 L/ha and Gallant super (Haloxypop-P-methyl) doses at 0.45-0.65 L/ha applied post In soybean field the Forward herbicide were applied in doses of 1.0-1.2l/ha have reduced the number of weeds by 90.1-91.6%, weight by 59.5-66.1% and super herbicide Gallantsuper applied in doses of 0.45-0.65l/ha have reduced the number of weeds by 91.0-95.0%, weight by 39.5-59.8% while Cobra herbicide applied in

emergence controls annual grasses and quack grass regrowth should be retreated at 10 to 15 cm high.

Cobra (lactofen) herbicide doses at 0.45-0.55 L/ha applied post emergence controls many broadleaf weeds, including Perennial Sowthistle. Cobra is a contact herbicide and 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. 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.

doses of 0.45-0.55l/ha used in broadleaved weed distributed field, have reduced the number of weeds by 90.2-94.6% and weight by 42.7-50.7%. Chemical weed controls with reduced doses were highly effective on weed population density and soybean yield, depending on herbicide type.

Table 2

Effectiveness of herbicides the yield soybean				
No	Variant	Doses of herbicides, l/hectar	Average yield, center/hectar	Added yield, center/hectar
1	Control	0	3.3	-
2	Gallantsuper	0.45	9.4	6.1
		0.55	10.2	6.9
		0.65	12.1	9.0
3	Cobra	0.45	6.9	3.6
		0.50	8.6	5.3
		0.55	7.7	4.4
4	Forward	1.0	12.3	9.0
		1.2	11.8	8.5

In soybean field in compared with the control for applied herbicide variants Gallantsuper with doses of 0.45-0.65 l/ha have given average of 9.4-12.1centner, Forward herbicide with dosage of 1.0-1.2 l/ha have given 11.8-12.3centner, while 0.45-0.55 l/hadose of Cobra herbicide were giving 6.9-7.7centner yield

respectively. As seen the results, the herbicide application increased the yield by 3.6-9.0center. Of the yield soybean following factors are direct dependent in present year total seasonal time of applied herbicide, soil fertile, distribution of precipitation, active heat amounts.

CONCLUSION

1. In the experimented soybean field 62.5% annual, 37.5% perennial weeds, out of 15 species of weeds belonging to 9 families and 12 genus, are distributed.
2. In soybean field the Forward herbicide were applied in doses of 1.0-1.2l/ha have reduced the number of weeds by 86.8-91.6%, weight by 38.7-66.1% and super herbicide Gallantsuper applied in doses of 0.45-0.65l/ha have reduced the number of weeds by 91.0-95.0%, weight by 39.5-59.8% while Cobra herbicide applied in doses of 0.45-0.55l/ha used in broadleaved weed

- distributed field, have reduced the number of weeds by 90.2-94.6% and weight by 42.7-50.7%.
3. In soybean field in compared with the control for applied herbicide variants Gallant super with dosage of 0.45-0.65 l/ha have given average of 9.4-12.1centner yield and Forward herbicide with dosage of 1.0-1.2 l/ha have given 11.8-12.3centner, while 0.45-0.55 l/hadose of Cobra herbicide were giving 6.9-7.7centner yield. The herbicide application increased of yield hectare by 3.6-9.0 center.

REFERENCES

1. Ariunaa O., "Effect of major weed controlled in soybean (*Glycine hispida* Max L.) field". Doctor of Agricultural Science thesis dissertation, 2014. UB
2. Grubov V.I., "The vascular plants of Mongolia", Ulaanbaatar, 2008
3. Dospheov B.A., "Technique of field experience". Moskva. 1973
4. Libershtein I.I, Tulikov. A.M., "Topical issues of weed control", 1980
5. Chinese colored weed illustrated book. China, 2000
6. Tserenbaljid. G "Color photos of plants antropophilus Mongolia", Ulaanbaatar, 2002