THE USE OF LONTREL 300 HERBICIDE FOR CONTROLLING BROADLEAF WEEDS IN STRAWBERRIES

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ABSTRACT

Broadleaf weeds are very harmful for strawberry crop because not all of them can be controlled by herbicides. For instance, Convolvulus arvensis can only be controlled just after emergence from the seed, otherwise this weed forms deep roots and cannot be controlled by any herbicide aftermath. The Lontrell 300 herbicide can control weeds from Compositae, Leguminosae, Solanaceae and Polygonaceae families. Our results showed that Lontrell 300 herbicide can be applied to strawberry crop at a rate of 300 ml per hectare in 300 liters of water. Moreover, our researches showed that it can be tank mixed with Goal 4F and Pantera herbicides.

INTRODUCTION

Herbicides are organic compounds that destroy weeds and do not affect crops [1;2;3;4]. The ways these substances can be applied are:

- on the soil, before planting (preplant) – total herbicides
- on the soil, before planting mixed with the soil (preplant incorporated – ppi) – volatile herbicides;
- on the soil after planting but before plant emergence (preemergence – pre);
- after the crop is established on the field – postemergence (post)

The main ways herbicides act are grouped in 7 categories:

1. Herbicides that mimic the action of growth regulators, so called hormonal herbicides. This group includes 2,4D, dicamba, clopyralid, etc. The symptoms of these herbicide active ingredients are the distortion of growth tissues and the collapse of the weed. The younger the weed, the better the effect of the herbicide.

2. Herbicides that affect the synthesis of certain aminoacids. The effect of these substances can be observed after several days because they affect the metabolism of the plant. This group includes: imazamox, sulphonil urea group, piroxsulam, florasulam, glyphosate, glufosinate.

3. Herbicides that inhibit the synthesis of fatty acids. This group of herbicides acts only on grass weeds like Johnson grass (Sorghum halepense) or Bermuda grass (Cynodon dactylon). Examples of this group are: propaquizafop, fluazifop, quizalofop, etc.

4. Herbicides that inhibit the growth of shoots and roots. These herbicides are applied on the soil and they enter into the small roots or underground shoots and stop their growth. Examples from this group are: metolachlor, pendimethalin, metazachlor, etc.

5. Herbicides that inhibit the photosynthesis. These herbicides are, also, divided in three categories:

- systemic herbicides that can be absorbed both through roots and leaves and acts in the leaves. Examples: metribuzine, linuron.
- contact herbicides that can be applied on the leaves and acts there, where there drop. Examples: bentazone, bromoxynil.
- systemic herbicides that can only be absorbed through leaves: fenmedifam, desmedifam, etofumesate.

6. Herbicides that burn the cellular membrane of the leaf. These herbicides can, also, be used as total contact herbicides. They include oxyfluorfen and piraflufen.

7. Herbicides that inhibit the synthesis of plant pigments. Here there are: isoxaflutole, sulcotrione, tembotrione, topramezone, etc. [5].

MATERIAL AND METHOD

The experiment was located at the Botanic Garden of University of Craiova in 2018 year and it comprised four treatments with the following herbicides:

- V1 not treated – control
- V2 Lontrel 300
- V3 Lontrel 300 + Goal 4F
- V4 Lontrel 300 + Goal 4F + Pantera.

The treatments have been made when most of the weeds were about 10 cm tall. There were made three treatments during the months of May, June and July.

There was made a determination of the weeding degree to the control plot. The results were appreciated after European Weed research Society scale.

RESULTS AND DISCUSSIONS

Table 1

The weeding degree at the control treatment in strawberries

Species	fenof/ height, cm	biol. cat.	Repetition					Av.	P%	K%
			I	II	III	IV	V			
Cirsium arvense	B/30	D.p.	-	3	-	-	-	0,6	1,1	20
Convolvulus arvensis	D/35	D.p.	5	-	-	-	2	1,4	2,6	40
Chenopodium album	B/15	D.a.	12	7	10	5	7	8,2	15,1	100
Stellaria media	C/25	M.a.	7	3	-	-	-	2,0	3,7	40
Amaranthus retroflexus	B/20	D.a.	8	15	7	6	4	8,0	15,0	100
Portulaca oleracaea	B/15	D.a.	6	-	-	6	-	2,4	4,4	40
Galinsoga parviflora	B/15	D.a.	21	12	-	-	-	6,2	11,4	40
Abutilon theophrasti	C/30	D.a.	-	-	2	-	-	0,4	0,7	20
Sorghum halepnse	D/20	M.p.	-	5	-	-	-	1,0	1,8	20
Cynodon dactylon	B/25	M.p.	-	-	8	-	-	1,6	2,9	20
Setaria glauca	B/25	M.a.	-	18	-	25	34	15,4	28,4	60
Xanthium italicum	B/20	D.a.	-	-	-	8	-	1,6	2,9	20
Xanthium spinosum	B/20	D.a.	-	-	3	-	-	0,6	0,7	20
Solanum nigrum	B/15	D.a.	6	-	7	9	-	4,4	8,1	60
Total			65	63	37	59	47	54,2		

These results show a high degree of participation within the average number per square meter of annual broadleaf weeds like: Chenopodium album, Xanthium strumarium, Amaranthus retroflexus, Portulaca oleracaea, and Solanum nigrum. A high degree of participation is also, seen to Convolvulus arvensis weed.

After applying the three kinds of herbicide treatments there obtained the following results:

Table 2

The efficacy of herbicide treatments to weeds on strawberry, after EWRS scale

The weed	fenof/ height, cm	biol. cat.	EWRS mark		
			V1	V2	V3
Cirsium arvense	B/30	D.p.	1	1	1
Convolvulus arvensis	D/35	D.p.	9	2	2
Chenopodium album	B/15	D.a.	9	2	2
Stellaria media	C/25	M.a.	9	2	2
Amaranthus retroflexus	B/20	D.a.	9	2	2
Portulaca oleracaea	B/15	D.a.	9	2	2
Galinsoga parviflora	B/15	D.a.	9	2	2
Abutilon theophrasti	C/30	D.a.	2	2	2
Sorghum halepnse	D/20	M.p.	9	9	1
Cynodon dactylon	B/25	M.p.	9	9	1
Setaria glauca	B/25	M.a.	9	9	1
Xanthium italicum	B/20	D.a.	1	1	1
Xanthium spinosum	B/20	D.a.	1	1	1
Solanum nigrum	B/15	D.a.	4	4	4

From these data we can observe that Cirsium arvense weed can easily be controlled by clopyralid. Convolvulus arvensis can only be controlled just after emergence from the seed, in order to prevent the infestation with this weed.

When this weed is in cotyledonous stage it can be burnt by oxyfluorfen substance from Goal 4F herbicide. Broadleaf annual weeds like: Chenopodium album, Stellaria media, Amaranthus retroflexus, Portulaca oleracaea and Galinsoga parviflora cannot be controlled by Lontrel 300 but they can be burnt by Goal 4F only if they are in cotiledonous stage. Abutilon theophrasti is affected by clopyralid, especially when it is in its early stage. Xanthium species are very easily controlled by clopyralid. Solanum nigrum is affected by clopyralid but if it is a mature plant it recovers several days after treatment, so for more efficacy this weed should be young, till 10 cm tall at the time of treatment.

Grass weeds are controlled by graminicide herbicide Pantera which was used in the third treatment.

CONCLUSIONS

1.Lontrel 300 herbicide can control weeds from Cirsium arvense family (Compositae). It also can control weeds from bean family (Leguminosae), tomato family (Solanacaeae).

2.Lontrel 300 herbicide can be mixed with Goal 4F herbicide in order to widen the number of species which can be controlled.

3.The mixing of the two first herbicides with Pantera, a graminicide, will control the grass weed species, too.

4.The combination of these three herbicides did not affected the strawberry plants at all.

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