

SOLUTIONS TO CONTROL THE VOLUNTEER SUNFLOWER FROM SOYBEAN CROP IN THE NORTH-WESTERN PART OF ROMANIA

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Abstract

In this paper we present the results obtained in 2020, results registered in the experience placed on soybean crop from SCDA Livada.

The experience carried out in soybean crop was aimed the control of volunteer sunflower with various post-emergence herbicides.

Key words: soybean, volunteer sunflower, selectivity, efficacy, yield.

INTRODUCTION

The biggest shortcoming of soybean crops is represented by danger of weeding, both at sunrise and after emergence, when they are growing. Damage caused by weeds at soybean, if no severe control measures are taken, amounts to 50-90% from yield potential of the varieties.

In current crop technology, herbicides remain the basic measure in weed control.

MATERIAL AND METHOD

In order to control the volunteer sunflower from the soybean crop, a randomized block experiment was placed, with 9 variants in three repetitions on a stagnogleized preluvosoil.

The herbicides studied were the following: Pulsar 40, Basagran Forte, Corum, Harmony 75WG.

The application rates of herbicides are presented in Table 1.

Period of herbicides application was postemergent.

Table 1
Herbicides applied at soybean crop, 2020

Var	Herbicide	Rate 1,kg/ha	Active substance
1	Pulsar 40	1.2	imazamox 40g/l
2	Pulsar 40	2.0	imazamox 40g/l
3	Basagran Forte	2.5	bentazon 480 g/l + wettol 100g/l
4	Basagran Forte	4.0	bentazon 480 g/l + wettol 100g/l
5	Corum + Dash	1.9+1.0	bentazon 480g/l + imazamox22,4g/l) + adjuvant
6	Corum + Dash	2.5+1.0	bentazon 480g/l + imazamox22,4g/l) + adjuvant
7	Harmony 75WG+ Trend	0.012+0.250	(tifensulfuron-metil, 750 g/kg) + adjuvant
8	Harmony 75WG+ Trend	0.020+0.250	(tifensulfuron-metil, 750 g/kg) + adjuvant
9	Untreated	-	-

During the vegetation period, observations were made on the selectivity of herbicides on soybean crop and the efficacy on volunteer sunflower and not only.

Determination of the selectivity was made by awarding the EWRS notes and of the efficiency by counting the volunteer sunflower and the weed species on 1 mp in each variant.

The biological material used in the experimental field was the Onix variety, an early variety, with good suitability for mechanized harvesting

Harvesting was done with the combine for harvesting of the experimental plots.

RESULTS AND DISCUSSION

The treatment was efefctuated in 16. 06. 2020.

Based on the observations made (Table 2) we appreciate that the herbicides: Basagran Forte, Corum and Harmony, applied in the phase of three trifoliate leaves of soybeans have a slight phytotoxicity, phytotoxicity that disappears with the vegetation growth of the crop plant.

Table 2
Selectivity of herbicides used for control of volunteer sunflower from soybean crop, 2020

Var	Herbicide	Rate 1,kg/ha	Time of application	Note EWRS - Selectivity	
				18.06.2020	18.08.2020
1	Pulsar 40	1.2	post	1	1
2	Pulsar 40	2.0	post	1	1
3	Basagran Forte	2.5	post	2	1
4	Basagran Forte	4.0	post	3	1
5	Corum + Dash	1.9+1.0	post	2	1
6	Corum + Dash	2.5+1.0	post	2,5	1
7	Harmony 75WG+ Trend	0.012 + 0.250	post	3	1
8	Harmony 75WG+ Trend	0.020+ 0.250	post	3	1
9	Untreated	-	-	1	1

Note EWRS

Note 1 = plannts without phytotoxicity symptoms; Note 9 = plannts with phytotoxicity symptoms

Observations on herbicide efficacy indicate that: by applying herbicides Basagran Forte 2.5 l / ha, Basagran Forte 4.0 l / ha, Corum 1.9 l / ha + Dash 1 l / ha, Corum 2.5 l / ha + Dash 1 l / ha we obtained a 100% control of volunteer sunflower. It should be noticed that this control was obtained only if the sunflower did not exceed a height of 20 cm.



Fig.1. Variant treated with herbicide Basagran Forte 2,5 l/ha



Fig. 2. Variant treated with herbicide Corum 1,9 l/ha + Dash 1 l/ha

With herbicide Basagran Forte we obtained 100% efficacy indifferently of the rate to control the sunflower weed, but with the herbicide Corum in a rate of 1.9 l / ha we controlled the volunteer sunflower, but control also the existing weeds in the plot, both monocotyledons and dicotyledons weeds.



Fig. 3. Variant treated with herbicide Basagran Forte 4,0 l/ha



Fig. 4. Variant treated with herbicide Corum 1,9 l/ha

In variants 1,2,7,8, variants in which we applied the herbicide Pulsar and Harmony in different rates, the efficacy on the volunteer sunflower was 0% (Table 3).

Table 3
The efficacy of herbicides to control volunteer sunflower in soybean crop, 2020

Var	Herbicide	Rate l/kg/ha	Time of application	Efficacy %
1	Pulsar 40	1.2	post	0
2	Pulsar 40	2.0	post	0
3	Basagran Forte	2.5	post	100
4	Basagran Forte	4.0	post	100
5	Corum + Dash	1.9+1.0	post	100
6	Corum + Dash	2.5+1.0	post	100
7	Harmony 75WG+ Trend	0.012+0.250	post	0
8	Harmony 75WG+ Trend	0.020+0.250	post	0
9	Untreated	-	-	0



Fig. 5. Variant treated with herbicide Pulsar 2,0 l/ha



Fig. 6. Variant treated with herbicide Harmony 20 g/ha

The best efficacy for weeds was obtained in the variant treated with Corum 2.5 l / ha + Dash11 / ha (Adjuvant) and the variant treated with Corum 1.9 l / ha + Dash11 / ha (Adjuvant) were registered an efficacy by 99-100% (Table 4).

Table 4

Efficiency of herbicides in weeds control from soybean crop, 2020

Var	Herbicide	Rate 1,kg/ha	Time of application	Efficacy%
1	Pulsar 40	1.2	post	45
2	Pulsar 40	2.0	post	62
3	Basagran Forte	2.5	post	37
4	Basagran Forte	4.0	post	61
5	Corum + Dash	1.9+1.0	post	99
6	Corum + Dash	2.5+1.0	post	100
7	Harmony 75WG+ Trend	0.012+0.250	post	25
8	Harmony 75WG+ Trend	0.020+0.250	post	10
9	Untreated	-	-	0

Analyzing the yields results we see that in the variants treated with Pulsar 40 1.2l / ha, Pulsar 40 2l / ha, Corum 1.9l / ha + Dash 11 / ha (Adjuvant), Corum 2.5l / ha + Dash 11 / ha (Adjuvant) the yield spore is statistically assured both untreated and compared to the average experience (Table 5). In the variants were we obtained a low efficiency, the yield spore

was not ensured statistically in the untreated variant, and compared to the average experience we obtained negative spore.

Table 5.

The influence of herbicide treatments on yield in soybean crop, 2020

No. Var.	Herbicide	Rate l/kg/ha	Yield q/ha	Diff. +/- to Mt	Diff. +/- to \bar{x}	Semnification	
						Mt	\bar{x}
1	Pulsar 40	1.2	55.9	12.9	4.7	xxx	x
2	Pulsar 40	2.0	62.0	19.0	10.8	xxx	xxx
3	Basagran Forte	2.5	43.3	0.3	-7.8	-	00
4	Basagran Forte	4.0	46.6	3.6	-4.5	-	0
5	Corum + Dash	1.9+1.0	61.6	18.6	10.4	xxx	xxx
6	Corum + Dash	2.5+1.0	62.3	19.3	11.1	xxx	xxx
7	Harmony 75WG+ Trend	0.012+0.250	46.0	3.0	-5.1	-	0
8	Harmony 75WG+ Trend	0.020+0.250	39.6	-3.4	-11.5	-	000
9	Untreated	-	43.0	-	-8.1	-	00
	Average Exp.		51.14		-		

LSD 5% = 4.45 q/ha 1% = 6.13 q/ha 0,1% = 8.44 q/ha

CONCLUSIONS

The research was carried out in 2020 on soybean crop, the experience being located at SCDA Livada on a stagnogleized preluvosoil. The herbicides applied in variants 3,4,7,8 showed a slight phytotoxicity that disappears with the advancement in vegetation.

Both in the control of volunteer sunflower weed and in the control of other existing weeds, the most efficient was herbicide Corum in both rates.

By applying the herbicide Pulsar 40 and Corum we obtained a yield spore statistically assured compared to both the untreated and the average experience.

The presence of volunteer sunflower in this experiment did not affect soybean yield, but uncontrolled weeds in variants 3,4,7,8 decreased the yield.

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