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THE EFFICACY OF DIFFERENT HERBICIDES IN CONTROL OF WEEDS FROM WHEAT CROP IN THE CONDITIONS FROM SCDA LIVADA

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Abstract

To deal with the weeds specific to the area, we placed at SCDA Livada a technological experience in the autumn wheat crop.

The research conducted in the agricultural year 2019-2020 on wheat crops aimed to establish the efficacy of herbicides applied in post-emergence on the floristic composition and the influence of herbicide treatments on yield in the conditions of the agricultural year 2019-2020.

Key words: wheat, floristically composition, efficacy, yield.

INTRODUCTION

Wheat, in the structure of field crops, has its share in Romania. The diversity of weed species as well as the differentiation in terms of their capacity led to the further study of new and more efficient herbicides.

Decreasing of weeds in crops efficiently, cost-effectively and in accordance with ecological rules is ensured through integrated control.The most important component of this is the application of herbicides.

The synthesis and launch on the market of new herbicides for weed control in the straw cereal crops, is a permanent concern of research worldwide and in our country.

MATERIAL AND METHOD

The researches were effectuated at SCDA Livada on a stagnogleized preluvosoil with a pH of 5.1, a clay content of 20.9% and a humus content of 2.8.

The experiment was placed in a randomized block, 18 variants in three repetitions, the plot area being 21 sqm, making the statistical calculation according to the variance analysis method.

The assessment of the herbicide efficacy was made before the wheat harvest by counting the weeds by species per 1sqm in each variant, calculating the efficacy according to the formula:

$$\text{Efficacy} = \frac{\text{Degree of untreated weeds - Degree of treated weeds}}{\text{Degree of untreated weeds}} \times 100$$

The biological material used in the experimental field was the *Glosa* wheat variety obtained at INCDA Fundulea.

The rates of used herbicides were specificate in Table 1.

For administering the herbicides, the equipment used was Plot Sprayer PSGF 4.3, tee jet nozzle type, 0.2 nozzle size and travel speed was 6 km / h.

The norm of the solution used was 500 l / ha, the administration being made for all variants at the same working pressure by 2 bar.

The herbicide application period was post-early autumn and post-emergence spring.

Table 1

The herbicides applied at wheat crop in 2020

Var	Herbicide	Rate l,kg/ha	Active substance
1	Sekator Progres OD	0.15	Iodosulfuron metil 25g/l+amidosulfuron100g/l+safener
2	Pelican Delta	0.100	Metsulfuron6g/kg +diflufenican 600g/kg
3	Trimax 50 SG	0.030	Tribenuron-metil 500g/l
4	Pallas 75 WG+Adjuvant	0.110+0.5	Piroxsulam 7,5% + safener
5	Pallas 75 WG+ Adjuvant	0.250+0.5	Piroxsulam 7,5% + safener
6	Floramix+Adjuvant	0.120+0.6	Piroxsulam70,8g/kg+florasulam14,2g/kg+safener
7	Floramix+Adjuvant	0.260+0.6	Piroxsulam70,8g/kg+florasulam14,2g/kg+safener
8	Attribut	0.060	Propoxicarbazon-sodiu 700g/kg
9	Axial One	1.0	Pinoxaden 45g/l+florasulam5g/l+safener
10	Axial One	2.0	Pinoxaden 45g/l+florasulam5g/l+safener
11	Lancelot Super	0.033	Aminopiralid30% + florasulam 15%
12	Helmstar 75 WG	0.020	Tribenuron-metil 75%
13	Galmet 20 SG	0.030	Metsulfuron-metil 200g/l
14	Rival Super Star	0.020	Tribenuron-metil 37,5% + clorsulfuron 37,5%
15	Joystick	0.200	Florasulam 20g/kg+iodosulfuron-metil-sodiu 50g/kg+diflufenican 400g/kg+cloquintocet-mexil 100g/kg
16	Joystick	0.200	Florasulam 20g/kg+iodosulfuron-metil-sodiu 50g/kg+diflufenican 400g/kg+cloquintocet-mexil 100g/kg
17	Dicopur Top 464 SL	1.0	Acid2,4 D din sare de DMA344g/l+dicamba 120g/l
18	Untreated	-	-

The climatic data registered at the weather station of SCDA Livada in the period 2019-2020 are presented in figure 1 and figure 2.

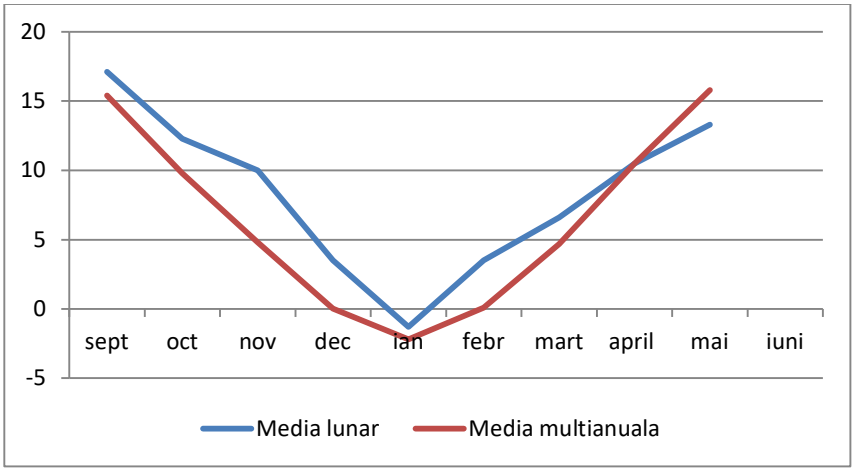
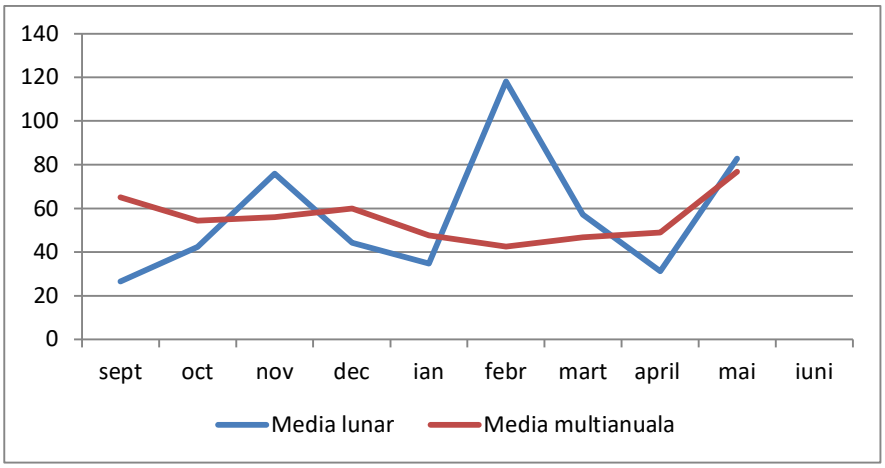


Fig. 1. Monthly temperature average (°C)

The multiannual temperature average registered at the Livada weather station in the last 56 years is 9.8°C. Compared to this value, we observe an increase of the average monthly temperature of 2019-2020, except for May 2020, when the monthly temperature average is below the value of the multiannual temperature average.



Fig, 2.Monthly rainfall (mm)

Analyzing the precipitation we see that: November and February of 2019-2020 were excessively rainy, exceeding the multiannual average which is over 740 mm.

RESULTS AND DISCUSSION

The degree of weeding was determined by counting the weeds by species per 1sqm in each variant (Table 2).

Table 2

Dominant weed species existing in untreated variant in wheat crop, 2020

Scientific name	Popular name	Density pl/mp	% Participation
Apera spica-venti	Iarba vântului	14	37
Elymus repens	Pir târâtor	2	5
Cirsium arvense	Pălămidă	3	8
Raphanus raphanistrum	Ridiche sălbatică	10	26
Convolvulus arvensis	Volbură	1	3
Viola arvensis	Trei frați pătați	3	8
Matricaria inodora	Mușețel prost	5	13
Total		**38**	**100**

These species of weed must be controlled before they can make strong phytocenoses that compete strongly with the wheat crop.

The control of these weeds was made with the herbicides specified in Table 1, herbicides which had a good efficacy.

Analyzing the efficiency of the products subject to research, in 2020 it is noted that: Floramix 260g / ha + Adjuvant 0.6 l / ha, Attribute 60g / ha, Pallas 75WG 250g / ha + Adjuvant 0.5l / ha, Pelican Delta 100g / ha are selective for wheat plants and assure a control of 85-98%.

Table 3

Selectivity and efficacy of treatment with herbicides in wheat crop, 2020

Var	Herbicide	Rate l,kg/ha	Application period	Selectivity Note EWRS	Efficacy %
1	Sekator Progres OD	0.15	post	1	72
2	Pelican Delta	0.100	post	1	85
3	Trimax 50 SG	0.030	post	1	53
4	Pallas 75 WG+Adjuvant	0.110+0.5	post	1	57
5	Pallas 75 WG+ Adjuvant	0.250+0.5	post	1	89
6	Floramix+Adjuvant	0.120+0.6	post	1	80
7	Floramix+Adjuvant	0.260+0.6	post	1	98
8	Attribut	0.060	post	1	94
9	Axial One	1.0	post	1	79
10	Axial One	2.0	post	1	77
11	Lancelot Super	0.033	post	1	57
12	Helmstar 75 WG	0.020	post	1	24
13	Galmet 20 SG	0.030	post	1	80
14	Rival Super Star	0,020	post	1	70
15	Joystick	0,200	post timpuriu	1	83
16	Joystick	0,200	post	1	83
17	Dicopur Top 464 SL	1,0	post	1	50
18	Netratat	-	-	-	0

At herbicide Pallas 75 WG it is noticed that at a low rate the efficacy is also much lower, but at herbicide Axial One the rate difference did not influence the efficacy.

In variants 15 and 16, variants in which were applied the herbicide Joystick the same rates, but the time of application was different, the efficiency in both cases is the same.

By applying the herbicides Helmstar 20g / ha, Dicopur Top 464 SL 1l / ha, Trimax 30g / ha, Lancelot Super 33g / ha was registered an efficiency of only 24-57% determined by the weeding degree with the species Apera spica-venti , herbicides having efficacy on dicotyledonous weeds.

The yield results highlight the opportunity to use herbicides to control weeds from the wheat crop. Thus, in the variant treated with the herbicide Floramix 260g / ha + Adjuvant 0.6l / ha the yield spores is significantly different from the untreated variant, and in the variants treated with the herbicides like Galmet 30g / ha, Rival Super Star 20g / ha and Joystik 200g /ha we registered an significant yield spore (Table 4).

Table 4

The influence of treatments with herbicides on yield in wheat crop, 2020

Var	Herbicide	Rate l,kg/ha	Time of application	Yield q/ha	Diff. +/-	Semnifi-cation
1	Sekator Progres OD	0,15	post	87,5	14,2	-
2	Pelican Delta	0,100	post	87,0	13,7	-
3	Trimax 50 SG	0,030	post	79,9	6,6	-
4	Pallas 75 WG+Adjuvant	0,110+0,5	post	81,6	8,3	-
5	Pallas 75 WG+ Adjuvant	0,250+0,5	post	81,8	8,5	-
6	Floramix+Adjuvant	0,120+0,6	post	86,8	13,5	-
7	Floramix+Adjuvant	0,260+0,6	post	93,5	20,2	xx
8	Attribut	0,060	post	81,6	8,3	-
9	Axial One	1,0	post	84,3	11,0	-
10	Axial One	2,0	post	82,6	9,3	-
11	Lancelot Super	0,033	post	72,5	-0,8	-
12	Helmstar 75 WG	0,020	post	81,6	8,3	-
13	Galmet 20 SG	0,030	post	90,6	17,3	x
14	Rival Super Star	0,020	post	89,1	15,8	x
15	Joystick	0,200	early post	88,9	15,6	x
16	Joystick	0,200	post	78,2	4,9	-
17	Dicopur Top 464 SL	1,0	post	79,5	6,2	-
18	Netratat	-	-	73,3	-	-

LSD 5% = 14,81 q/ha 1% = 19,85 q/ha 0,1% = 26,20 q/ha

CONCLUSIONS

The researches were carried out in the agricultural year 2019-2020 on the winter wheat crop.

The experience was installed in Satu-Mare county at Agricultural Research Development Station Livada on a stagnogleized preluvosoil with a pH of 5.19, clay content of 20.9% and humus content of 2.8.

The experiments was set up using the latin rectangle method with 8 variants in three replications.

Dominated weeds species in wheat crop were: *Apera spica-venti, Elymus repens, Cirsium arvense, Raphanus raphanistrum, Convolvulus arvensis,Viola arvensis, Matricaria inodora.*

All applied herbicides had a very good selectivity.

From the point of view of efficiency, the best variants were the variants treated with: Floramix 260g / ha + Adjuvant 0.6 l / ha, Attribute 60g / ha, Pallas 75WG 250g / ha + Adjuvant 0.5l / ha, Pelican Delta 100g / ha, variants with an efficacy between 85-89%.

Yield spore statistically assured were obtained at variants treated with Floramix 260g/ha + Adjuvant 0,6l/h, Galmet 30g/ha, Rival Super Star 20g/ha and Joystik 200g/ha.

Farmers and not only have the opportunity based on these results to establish the most efficacy and efficient methods of weed control in the winter wheat crop.

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