

## RESEARCHES ON THE EFFICACY OF HERBICIDE TREATMENTS AT WINTER WHEAT CROPS ON THREE TYPES OF SOIL IN NORTHWEST OF ROMANIA

Mondici Susana\*, Fritea Teofil\*, Brejea Radu\*\*

\*Agricultural Research and Development Station Livada, 7 Baia Mare St., Livada,

Romania, e-mail: [mondicisuzana@yahoo.com](mailto:mondicisuzana@yahoo.com); [teofil.fritea@yahoo.com](mailto:teofil.fritea@yahoo.com)

\*\*University of Oradea, Faculty of Environmental Protection, 26 Gen. Magheru St., 410048, Oradea, Romania, e-mail: [rbrejea@yahoo.com](mailto:rbrejea@yahoo.com)

### Abstract

*In this paper we present synthetically the results obtained during the period 2015-2016, the results obtained in the experiments on the winter wheat crops on three soil types at Livada (Satu Mare County) on typical clay soil and at Bervenii (Satu Mare County) on typical chernozem and histosol.*

*In this experiment, the floral composition of weeds and the effectiveness of herbicide treatments on the three soil types were followed.*

**Key words:** winter wheat, soil type, efficacy of herbicides.

### INTRODUCTION

Since straw cereals are grown in all areas of the country, with very different climatic conditions and soil, the spread of weeds that infest these crops is also very varied, both in species, but especially as a species ratio (Berca, 2004)

In the conditions in our country, the yield losses caused by weeds on the winter wheat crop was appreciated by the Șarpe (1975) at 500 kg / ha, representing 20% of the average production taken into account (25q / ha).

Analyzing grain yield losses in winter wheat crops on different production levels, the following absolute and relative values were found. (Ciorlăuș, 1978)

Table 1

Possible yield losses at winter wheat crop (după Ciorlăuș)

The Yield t/ha	Possible Yield Losses	
	Relative %	Absolute q/ha
10-20	42	70
20-30	2	60
30-40	15	50
>40	10	45

## MATERIAL AND METHOD

The experiments were located in Satu-Mare County at SCDA Livada on a typical clay soil with a pH of 5.6, a clay content of 22.4% and a humus content of 1.8 and at Berveni (Satu Mare County) on two soil types: typical chernozem with a pH of 7.9, a clay content of 27.5% and a humus content of 3.4 and histosol with a pH of 5.1 and the organic content of 86% being a nutrient-rich soil.

The experiment were conducted on the Latin rectangle method in three blocks, the plot area being 21 square meters.

The treatment variants for which the herbicide effectiveness was tested were:

Table 2

*The applied herbicide treatments at winter wheat crop*

No. Var	Herbicide Treatments	Dosage l,kg/ha	Active Substance
1	Rival 75GD	0.015	Clorsulfuron 75%
2	Rival+Hudson	0.010+1.0	Clorsulfuron 75% + fluoxipir 200g/l
3	Dicopur D	1.0	Acid2,4 D din sare de dimetilamină 600g/l
4	Rival Star 75GD	0.015	Tribenuron-metil 75%
5	Rival Star 75GD	0.020	Tribenuron-metil 75%
6	Axial One	1.0	Pinoxaden 45g/l+florasulam5g/l+safener
7	Axial One	2.0	Pinoxaden 45g/l+florasulam5g/l+safener
8	Lancelot Super	0.033	Aminopiridid30% + florasulam 15%
9	Pallas 75 WG+Adjuvant	0.110+0.5	Piroxulam 7,5% + safener
10	Attribut	0.060	Propoxicarbon-sodiu 700g/kg
11	Floramix+Adjuvant	0.120+0.6	Piroxulam70,8g/kg+florasulam14,2g/kg+safener
12	Floramix+Adjuvant	0.260+0.6	Piroxulam70,8g/kg+florasulam14,2g/kg+safener
13	Rival Super Star	0,020	Tribenuron-metil 37,5% + clorsulfuron 37,5%
14	Pelican Delta	0,100	Metsulfuron6g/kg +diflufenican 600g/kg
15	Pallas 75 WG+ Adjuvant	0.250+0.5	Piroxulam 7,5% + safener
16	Sekator Progres OD	0.15	Iodosulfuron metil25g/l+amidosulfuron100g/l+safener
17	Dicopur Top 464 SL	1.0	Acid2,4 D din sare de DMA344g/l+dicamba 120g/l
18	Untreated	-	-

The moment of herbicide treatment application was post-emergence.

The biological material used in the experimental fields was the Glosa winter wheat variety obtained at INCDA Fundulea. It is a precocious variety, has good resistance to fall, is resistant to wintering, to drought and heat. It also has a good resistance to spruce, with medium resistance to brown rust, but instead it has good resistance to powdery mildew.

## RESULTS AND DISCUSSION

The estimation of herbicidal efficacy was done by counting weeds per species per 1 square meter in each plot of the experiments.

The results obtained in the experiments conducted on the Latin rectangle method on the three soil types: typical clay soil, typical chernozem and histosol show that the best variant is the variant treated with Rival 10g / ha + Hudson 1l / ha on typical chernozem, where an efficacy of 100% was obtained (Table 3).

Good results were also obtained on the typical clay soil from Livada, the best efficacy was achieved in the variant treated with Attribut 60g / ha followed by variants treated with Pallas75 WG + Adjuvant 0.5l / ha, Dicopur Top 464 SL 1l / ha (Table 3).

Analyzing the efficacy of herbicide treatments on histosol, it was found that the best control of weeds was achieved in the variant treated with Rival 10g / ha + Hudson 1l / ha and in the variant treated with Rival Star 75 GD 15g / ha.

Analyzing the efficacy of herbicide treatments in winter wheat crops, it was found that in all the treated variants we had very good efficacy irrespective of the soil type.

*Table 3*

*The efficacy of herbicide treatments at winter wheat crops on typical clay soil, typical chernozem and histosol*

No. var.	Herbicide Treatments	Dosage l,kg/ha	The efficacy %		
			typical clay soil	typical chernozem	histosol
1	Rival 75GD	0,015	88	92	91
2	Rival+Hudson	0,010+1,0	97	100	98
3	Dicopur D	1,0	97	94	78
4	Rival Star 75GD	0,015	93	95	98
5	Rival Star 75GD	0,020	93	93	96
6	Axial One	1,0	92	80	90
7	Axial One	2,0	97	99	97
8	Lancelot Super	0,033	97	96	93
9	Pallas 75 WG+Adjuvant	0,110+0,5	98	98	85
10	Attribut	0,060	99	91	93
11	Floramix+Adjuvant	0,120+0,6	93	93	87
12	Floramix+Adjuvant	0,260+0,6	92	90	85
13	Rival Super Star	0,020	94	96	86
14	Pelican Delta	0,100	95	97	96
15	Pallas 75 WG+ Adjuvant	0,250+0,5	94	94	91
16	Sekator Progres OD	0,15	95	94	95
17	Dicopur Top 464 SL	1,0	98	78	80
18	Untreated	-	0	0	0

Soil fertility influences the production potential of winter wheat crops and beyond

Under the conditions of the agricultural year 2015-2016, analyzing the influence of the type of soil on the yield in the winter wheat crop, a

statistically assured yield gain was obtained in the experiments on the typical chernozem (Table 4).

Table 4

*The influence of the soil type on the yield*

Type of soil	Yield q/ha	Difference q/ha	Relative Yield %	Statistical Significance
Typical Clay Soil	83,69	-	100	
Typical Chernozem	100,10	16,41	119,6	x
Histosol	91,03	7,34	108,7	

LSD at 5% 10,19 q/ha

The results obtained in the experiments located on the three soil types for the winter wheat crops show that significant yield increases from the average experiment yield were obtained on histosol in the herbicide-treated variants: Rival 10g / ha + Hudson 1l / ha, Axial One 2l / ha, Lancelot Super 33g / ha, Attribut 60g / ha and Pelican Delta 100g / ha (Table 5).

Yield increases were also achieved on typical clay soil and typical chernozem but these increases are not statistically assured

Table 5

*The influence of herbicide treatments over the winter wheat yield tested on typical clay soil, typical chernozem and histosol*

No. Var	Yield q/ha			Difference +/- From the Average			Statistical Significance		
	Typical Clay Soil	Typical Chernozem	Histosol	Typical Clay Soil	Typical Chernozem	Histosol	Typical Clay Soil	Typical Chernozem	Histosol
1	89.8	106.0	92,1	6.2	5.95	6.07			
2	85.6	108.7	99,2	2.0	8.65	13.17			x
3	79.9	98.6	86,6	-3.7	-1.45	0.57			
4	77.1	102.4	94,8	-6.5	2.35	8.77			
5	75.4	105.4	89,5	-8.2	5.35	3.47			
6	81.0	103.5	88,9	-2.6	3.45	2.87			
7	84.5	102.2	96,5	0.9	2.15	10.47			x
8	87.0	103.5	96,7	3.4	3.45	10.67			x
9	82.0	102.2	92,1	-1.6	2.15	6.07			
10	82.2	101.2	96,1	-1.4	1.15	10.07			x
11	80.7	104.3	90,6	-2,9	4.25	4.57			
12	84.5	98.4	88,3	0,9	-1.65	2.27			
13	88.7	105.2	94,0	5,1	5.15	7.97			
14	88.5	106.8	96,3	4,9	6.75	10.27			x
15	84.5	100.3	90,6	0,9	0.25	4.57			
16	84.7	100.5	94,8	1,1	0.45	8.77			
17	83.0	90.2	86,4	-0,6	-9.85	0.37			
18	86.8	61.6	64,5	3,2	-38.5	-21.53			

Typical Clay Soil LSD at 5% 8,79 q/ha Xavg = Experimental Average Yield= 83,60 q/ha

Typical Chernozem LSD at 5% 14,01 q/ha Xavg = Experimental Average Yield = 100,05 q/ha

Histosol LSD at 5% 9,85 q/ha Xavg = Experimental Average Yield = 86,03 q/ha

**CONCLUSIONS**

The research was carried out between 2015-2016 on three soil types in the winter wheat crop.

The experiments were located in Satu-Mare County at the Agricultural Research and Development Station Livada on a typical clay soil and at the Berveni Village near Carei City on the typical chernozem and on histosol.

The effectiveness of post-emergence herbicides in winter wheat crops is different on soil types depending on prevalent weed species at the time of treatment.

On the clay soil at Livada, the yield increases were not statistically significant compared to the experimental average yield, even in some treatment variants the yield was lower than the experimental average yield even with 8q / ha.

On typical chernozem, the yield was strongly influenced by the level of weed infestation, reducing the yield by even 10q / ha.

The weed infestation on histosol had the strongest influence over the level of grain yield compared to the other two soil types.

Soil fertility influences the winter wheat crop yield potential.

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