

## MONOCOTYLEDONOUS WEEDS CONTROL IN MAIZE CROPS BY CHEMICALLY METHODS

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### ABSTRACT

Although in Romania, monocotyledonous weeds species are few in number, compared to the dicotyledonous, the density and rapacity which sometimes creates more damage than dicotyledonous. In the present study was attempted several monocotyledonous weed control solutions, in the experiences this species was dominant.

The researches were conducted during 2008-2009, using both herbicides pre emergence and post emergence, in 2009 interventions was and with a total herbicide applied before sowing.

**Key words:** *weed, maize, control, herbicide*

### INTRODUCTION

Due to slow growth in the first 6-8 weeks and the small number of individuals, 3-5 maize plant per m<sup>2</sup> is creating a fierce competition at home in favor of weeds that the number (200-800/m<sup>2</sup>) and rapacity for space, water and food to win the fight causing damage to several thousand kg per hectare maize (Anghel et al, 1972; Gus et al, 1998). Weeds control methods have long been especially non-chemical. The development of herbicides has become possible to drastically change weeds control techniques (Post, 1996). Chemical control method is a solution to control weeds, herbicides are the most economical and fastest means to control weeds. The chemical control can be a pathway achieved in two alternatives: soil treatments before or after planting and during the vegetation treatments (Berca, 1996).

Monocotyledonous weeds, although numbers are lower than dicotyledonous weeds by their high density cause serious damage to maize crops.

### MATERIALS AND METHODS

The researches were conducted in ICDPP Bucharest, between 2008-2009, on chromic-luvisols soil (LCvr), neutral pH, with a humus content of 2%. Experience was organized in randomized blocks, each variant with four repetitions, using herbicides in different times of application as follows:

2008

a. pre emergence

1S-metolachlor (312.5 g/l) + Terbutylazine (187.5 g/l) - 5 l/ha;

2. S-metolachlor (960 g/l) - 1.5 l/ha;

3. Acetochlor (820-869 g/l) + antidote - 2.2 l/ha

## b. post emergence

1 Rimsulfuron (50%) + thifensulfuron methyl (25%) - 0.020 kg/ha + adjuvant 0.1%;

2. Nicosulfuron (40 g/l) - 1.5 l/ha;

3. Rimsulfuron (250 g/l) - 0.060 kg/ha + surfactant

2009

## a. Before sowing

Glyphosate (360 g/l) -1.5 l/ha;

## b. pre emergence

S- metolachlor (312.5 g/l) + terbuthylazine (187.5 g/l) - 4.0 l/ha;

## c. post emergence

1 Rimsulfuron (50%) + thifensulfuron-methyl (25%) - 0.020 kg/ha + adjuvant 0.1%;

Herbicides were applied with worn equipment, manually operated, using a Solo 456 type device, using a quantity of 300 liters of solution per hectare. Treatment efficacy was expressed as a percentage comparative to unhoed check.

Weeds control was assessed 30 DAT and 60 DAT, as % reduction in weed bio-volume, relative to the untreated check. Selectivity was assessed by EWRS notes (1- selectivity 100%, 9- selectivity 0%)

## RESULTS

The main weeds specified in the experimental field were:

- Annual monocotyledonous weeds: *Setaria glauca* (L.) Pal.Beauv., *Setaria viridis* (L.) Pal.Beauv., *Echinochloa crus-galli* (L.) Pal.Beauv.;

- Perennial monocotyledonous weeds: *Sorghum halepense* L. (Pers);

- Annual dicotyledonous weeds: *Amaranthus retroflexus* L., *Chenopodium album* L., *Xanthium strumarium* L.;

- Perennial dicotyledonous weeds: *Cirsium arvense* (L.) Scop., *Convolvulus arvensis* L., *Sonchus arvensis* L., etc.

In 2008, of the three herbicides applied pre emergence (Table 1), the combination of S-metolachlor + terbuthylazine achieved an efficiency of 93% which was seconded by the other two herbicides tested, an effect that lasts 60 days after treatment. If post emergence herbicides applied (Table 2), the three herbicides tested had a very good efficacy against monocotyledonous weeds, including *Sorghum halepense* species of rhizomes (> 85%), with some superiority in combination rimsulfuron + thifensulfuron-methyl, which effectively maintained after 60 days of treatment.

Table 1. Efficacy of herbicides applied pre emergence to maize crop, 2008

Variant	Dose (kg.l / ha)	Selectivity Nota EWRS	Efficacy			
			30 DAT		60 DAT	
			weeds / m <sup>2</sup>	%	weeds / m <sup>2</sup>	%
Untreated	-	-	76	-	118	-
S-metolachlor (312,5 g/l) + terbuthylazine (187,5 g/l)	5,0	1	4	95	8	93
S-metolachlor (960 g/l)	1,5	1	19	75	32	73
Acetochlor (820-869 g/l + antidot)	2,2	1	20,5	73	30	75

Dens.= density (weeds plants / m<sup>2</sup>)

E.% = efficacy (% control of weeds relative to unhoed check)

Table 2. Efficacy of herbicides applied post emergence to maize crop, 2008

Variant	Dose (kg.l / ha)	Selectivity Nota EWRS	Efficacy			
			30 DAT		60 DAT	
			weeds / m <sup>2</sup>	%	weeds / m <sup>2</sup>	%
Untreated	-	-	120	-	128	-
Rimsulfuron (50 %) +Thifensulfuron methyl (25 %)+Adjuvant 0,1 %	0,020	1	10	92	8	94
Nicosulfuron (40 g/l)	1,5	1	14	88	18	85
Rimsulfuron (250 g/l)	0,060	1	12	90	14	89

Dens.= density (weeds plants / m<sup>2</sup>)

E.% = efficacy (% control of weeds relative to unhoed check)

In 2009 we continued the experience of 2008 and introducing glyphosate herbicide applied before sowing (Table 3), applied at low dose in order to control weeds that have appeared before sowing. Also introduced a variant in which weeds are fought hand. Continue to walk the same scheme in 2008, applying in pre emergence the combination S-metolachlor + terbuthylazine (Table 4) and in post emergence the combination rimsulfuron + thifensulfuron-methyl (Table 5).

Similar results were in 2009 year comparative with 2008 year, the controlling percentage was .95%.

Table 3. Efficacy of herbicide applied before planting the maize crop, 2009

Variant	Dose (l/ha)	Efficacy (EWRS note)
Glyphosate (360 g/l)	1,5	1
Untreated	-	9

Table 4. Efficacy of herbicides applied pre emergence to maize crop, 2009

Variant	Dose (kg.l / ha)	Selectivity (EWRS note)	Efficacy	
			30 DAT	
			weeds / m <sup>2</sup>	%
Untreated	-	1	66,5	-
Hoed	-	1	1,5	97,7
S-metolachlor (312,5 g/l)+terbuthylazine (187,5 g/l)	4	1	5,5	91,7

Dens.= density (weeds plants / m<sup>2</sup>)

E.% = efficacy (% control of weeds relative to unhoed check)

Table 5. Efficacy of herbicides applied post emergence to maize crop, 2009

Variant	Dose (kg.l / ha)	Selectivity (EWRS note)	Efficacy	
			30 DAT	
			weeds / m <sup>2</sup>	%
Untreated	-	1	107	-
Hoed	-	1	0,5	-
Rimsulfuron (50 %) + Thifensulfuron methyl (25 %)+Adjuvant 0,1 %	0,020	1	5	95,3

Dens.= density (weeds plants / m<sup>2</sup>)

E.% = efficacy (% control of weeds relative to unhoed check)

## CONCLUSIONS

The herbicides against grass weeds are chosen depending of density weeds and soil moisture thus:

-In the spring when soil moisture is satisfactory and prevail annual monocotyledonous weeds recommend herbicides applied pre emergence;

-When springs are dry recommended herbicides applied post emergence, most herbicides applied post emergence controlling and the perennial monocotyledonous weeds, especially *Sorghum halepense* of rhizome;

To control all weeds, herbicides mentioned above are combined with the herbicides against dicotyledonous weeds.

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