THE EFFICYENCY AND SELECTYVITY OF HERBICIDE OXYFLUORFEN IN WEED CONTROL IN THE VINE PLANTATIONS, IN THE VINEYARD – DEALU MARE

EFICACITATEA ŞI SELECTIVITATEA ERBICIDULUI OXYFLUORFEN, ÎN COMBATEREA BURUIENILOR DIN PLANTAŢIILE DE VII RODITOARE – PODGORIA DEALU MARE

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Abstract. *A trial was carried out to evaluate vine selectivity and weed control with oxyfluorfen formulated as suspension concentrates 480 g/l of active ingredient (Goal 480 SC) and concentrate emulsionable 240 g/l a.i.(Goal 240 EC) Efficacy experiments were conducted to determine the effect of rate, formulation, and application way of oxyfluorfen herbicide on annual grasses and broadleaves control and the tolerance of grapevigne to this herbicide. Oxyfluorfen was applied in preemergence on a clean soil and in postemergence when weeds had an average of two to three leaves and were no taller than 10-12 cm. Untreated controls and hand-weeded (weed-free) plots were also included for comparison. Four replications of all treatments were arranged in a randomized complete block design, and all data recorded were analyzed statistically. Means were separated by LSD at P = 0.05. Rainfall thereafter was frequent and adequate to support germination and rank growth of the following weed species: Chenopodium album L.,Capsella bursa-pastoris L.,Portulaca oleraceea L., Lamium amplexicaule L., Digitaria spp., Setaria spp. Data recorded during May and August included weed control ratings and percent weed ground cover. Results showed that oxyfluorfen 480 g/l (SC) was very similar to oxyfluorfen at 240 g/l (EC) and both formulations were efficient to control annual weeds when applied in pre-emergency or early post at different evaluation times, with no damage to grapevine. Although the highest sugar content of grapes occurred in the hand weeded controls, followed by all herbicide-treated plots, then by the nonweeded controls, the only statistically significant differences were between the hand weeded and nonweeded controls.*

Rezumat. *Au fost studiate două formulări chimice ale erbicidului oxyfluorfen (suspensie concentrată 480 g/l, concentrat emulsionabil 240 g/l) în scopul evaluării selectivităţii faţă de viţa de vie şi eficacitatea de combatere a buruienilor. Tratamentele au fost efectuate în preemergenţă şi în postemergenţă devreme, când buruienile se prezentau în stadiile de la 2-4 frunze cu o înălţime de max. 10-12 cm. In câmpul experimental au fost instalate şi variantele: martor lucrat manual, martor netratat, experienta având 24 variante experimental, cu patru repetitii, aşezate în teren după metoda parcelelor subdivizate. Rezultatele obţinute arată că cele 2 formulări chimice ale erbicidului oxyfluorfen sunt selective faţă de viţa de vie şi au o eficacitate ridicată de combatere a buruienilor. Conţinutul de zahăr al strugurilor a fost ridicat, apropiat de martorul lucrat manual. Erbicidul oxyfluorfen a prezentat selectivitate faţă de viţa de vie.*

The chemical method of control is being every day more used and spread (Dastgheib and Frampton, 2000), in reason of their results they be faster, efficient and with accentuated residual effect, what allows, still, the control of the weeds before or after their emergency, reducing like this the possibility of reinfestation of the area and, consequently, the number of cultural treatments, making possible better distribution of the labor in the property. Among the recommended herbicides, the oxyfluorfen has been used extensively in the control of grassy and dicotyledonous weeds in vineyard (Domoto, 2003; Hannah, 2006). The objective of the work was to evaluate the acting of the herbicide oxyfluorfen formulated as much as suspension to 480 g/l, and emulsionable to 240 g/l concentrated.

MATERIALS AND METHODS

The purpose was to assess the biogical activity of oxyfluorfen herbicide. Studies were conducted on yelding vine in the experimental fields on a forest brown-reddish soil, with a neutral pH. An application of the treatments was accomplished in 23/05/05, in pré and early poast stage, in total area, when the plants harmful dicotyledonous were with two true leaves, and the grassy ones with three open leaves, using equipment of precision. The equipment was operated to 2,45 kg/cm^2, the a speed of 4,2 m/s, using a volume of water of 200 l/ha.

The trial was set up as a linear blocks design with 4 replications and individual plots of 86.4 m^2, the application way was adopted, characterizing the stadium of the harmful plants in the moment of the application (pré and initial post-emergency); as secondary treatment (subparcelas) the oxyfluorfen doses so much to 480 g/l as to 240 g/l was adopted; as subsubparcelas, the different times of evaluation of the efficiency of the oxyfluorfen.The evaluation times (sub-subparcelas) they were 30, 60, 90 and 120 days after application of the treatments (DAT) for the evaluations.

They were also included two witnesses, a weeded during the whole cycle of the experiment to evaluate possible toxicity symptoms to the plants of grapevine and another maintained without weeding for ends of comparison of his effectiveness in the control of the harmful plants, both no included in the variance analysis

For evaluation ends, were considered the species with homogeneous dispersion and the frequency of positive occurrence in the experimental portions

The effect of the herbicides was evaluated, being attributed notes from 0 to 100, in that 0 represent control absence and of toxicity and 100 total control of the species and total death of the plants. All the data were submitted to the variance analysis by the test F to 5% of probability.

RESULTS AND DISCUSSIONS

The variance analysis of the relative data to the control of annual weeds shows there to be significant effect of the factors doses and evaluation time separately, as well as of the interactions among them. All of the treatments were similar among themselves and significantly superior to the untreated control, independently of the formulation of used oxyfluorfen, in the application way and of the evaluation time.

The control of annual grasses and broadleaves at Valea Călugărească with oxyfluorfen herbicide was >70% throughout the summer in 2005 (tables 1 and 2).

Table 1

Efficiency ofoxyfluorfen on annual weeds in pre and earrly poast stage

	Doses	Application way	Efficacy %			
			T+30[3] (c_1)	T+60 (c_2)	T+90 (c_3)	T+120 (c_4)
Oxyfluorfen 480 SC	480 ml/ha (b_1)	Pre (a_1)	84.2	85.1	60.0 000	47.7 000
		Post (a_2)	82.7	87.7	64.0 000	48.0 000
	720 ml/ha (b_2)	Pre (a_1)	88.3	90.7	89.3	72.0 000
		Post (a_2)	89.0	92.0	90.3	78.0 0
	960 ml/ha (b_3)	Pre (a_1)	90.3	94.0	91.7	86.3
		Post (a_2)	91.0	95.7	92.3	91.2

Analyze of variance (summary):

F5% (Application way –A) 1.47 (18.51)
F5% ((Doses –B) ..... 23.4*** (4.46)..
F 5% ((Evaluation time –C).. 27.2*** (2.84)
DL5%= 12.0; DL1%= 16,0; DL 0.1%= 21.1

F5% ((A*B).....0.10 (4.46)
F5% ((A*C).... 0.17 (2.84)
F5% ((B*C)..... 9.10*** (2.34)
F5% ((A*B*C)..0.11 (2.34)

[1] Active ingredient (g/ha) ;
[3] Days after application; [4] Goal 4F concentrated suspension;

Table2

Efficiency ofoxyfluorfen on annual weeds in pre and earrly poast stage

	Doses	Application way	Efficacy %			
			T+30[3] (c_1)	T+60 (c_2)	T+90 (c_3)	T+120 (c_4)
Oxyfluorfen 240 CE[4]	480 ml/ha (b_1)	Pre (a_1)	83.3	85.8	59.0 000	49.0 000
		Post (a_2)	84.0	86.0	62.3 000	49.0 000
	720 ml/ha (b_2)	Pre (a_1)	89.0	91.0	87.3	73.0 000
		Post (a_2)	88.0	90.7	91.0	79.0 0
	960 ml/ha (b_3)	Pre (a_1)	90.0	94.0	92.0	85.0
		Post (a_2)	92.0	95.0	91.0	90.9

Analyze of variance (summary):

F5% (Application way) –A) 1.0 (18.51)
F5% ((Doses –B) 20.1*** (4.46)
F 5% ((Evaluation time –C) . 26.5*** (2.84)
DL 5%=11.8; DL 1%=15.9; DL 0.1%=21.0

F5% (A*B).....0.01 (4.46)
F5% ((A*C)..... 0.20 (2.84)
F5% ((B*C)..... 8.70*** (2.34)
F5% (A*B*C).....0.20 (2.34)

[1] Active ingredient (g/ha)
[2] Days after application; [4] Goal 2XL Concentrated emulsionable

Results that demonstrate the residual effect shows that it is a fall in the level of oxyfluorfen control in the smallest doses (480-720 ml/ha) starting from 90-120 DAT, that didn't reach satisfactory level of control, when applied in pre- or initial post-emergency. Pre or early poast applications of oxyfluorfen at 480-720 ml/ha a.i. controlled less than 80% annual weeds by late August; at 960 ml/ha a.i. controlled a higher percentage of annual weeds (85-95%) at 90-120 days after the initial treatment.

The unfolding of the interaction between treatments and evaluation time shows that independently in the application way, until the second evaluation time,

all of the treatments were similar amongst themselves, only differing of the witness without weeding. Starting from the third evaluation time, annual weeds were shown significantly more sensitive to the largest doses ,while in the last evaluation time only the treatment with oxyfluorfen to 960 ml /ha presented acting significantly superior to the others and similar to the of the weeded witness considered as 100%.

During the whole cycle of the plants of grapevine treated with oxyfluorfen didn't present symptoms of current offenses of the use of the product, showing a normal aspect, independently of the formulation of the product used.

The highest sugar content of grapes occurred in the hand weeded controls, followed by all herbicide-treated plots, then by the nonweeded controls, the only statistically significant differences were between the hand weeded and nonweeded controls (table 3).

Table 3

Influence of the herbicide oxyfluorfen about the sugar content of grapes (Merlot)

Experimental variant	g/l	+/- D	%
Untreted	185.3	0.0	100
Cultivation	203.7	18.4**	110
oxyfluorfen 480 g /ha a.i. (CE)	195.3	10.0	105
oxyfluorfen 720 g /ha a.i.(CE)	194.0	8.7	105
oxyfluorfen 960 g /ha a.i.(CE)	193.7	8.4	105
oxyfluorfen 480 g /ha a.i.(SC)	193.7	8.4	105
oxyfluorfen 720 g /ha a.i.(SC)	196.7	11.4	106
oxyfluorfen 960 g /ha a.i.(SC)	195.0	9.7	105
DL 5%=11.5; DL 1%=15.5; DL 0.1%=20.6			

CONCLUSIONS

The herbicide applied oxyfluorfen in the formulations 480 and 240 g/l was efficient in the control of the annual grasses and broadleaves. The pré-emergency or initial post-emergency applications gave effective weed control for a period of time between 2 to 4 months when applied in doses of 480-960 ml/ha a.i. The oxyfluorfen formulation to 480 g/l, when compared with 240 g/l, it allows a reduction in the dose of the commercial product, without affecting the effectiveness of control of the mentioned species The herbicide oxyfluorfen, in the different formulations and tested doses did not cause apparent symptoms of phytotoxicity in vine.

REFERENCES

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