

EFFICACY AND SELECTIVITY OF SOME HERBICIDES HAVING COMPLEX ACTION IN CONTROLLING THE WEEDS IN THE VITICULTURAL PLANTATIONS

EFICACITATEA ȘI SELECTIVITATEA UNOR ERBICIDE CU ACȚIUNE COMPLEXĂ ÎN CONTROLUL BURUIENILOR DIN PLANTAȚILE VITICOLE

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Abstract. *Under the row weed management in many vineyards have traditionally relied on the use of a pre-emergence herbicide application in the spring followed by an application of a post-emergence herbicide in June (or around grape bloom). Concerns over the potential for ground water contamination through the use of pre-emergence herbicides applied directly to the soil, the persistence of these herbicides in the soil and the need to increase the rates of these herbicides to achieve reliable weed management caused researchers to examine other weed management options. Research indicated that two properly timed applications of a broad spectrum, post-emergence herbicide (early June and mid-late July) could be as effective as a conventional weed management program using persistent pre-emergence herbicides. The pre-emergent herbicides have been identified as problematic materials, present water quality problems. Regulatory and environmental issues surrounding the use of these chemicals in vineyards are going to put pressure on growers to use less of these materials. Contact-only herbicides such as glyphosate represents a technique as alternative to the use of pre-emergent herbicides in vineyards. In these experiments, the post-emergence program managed annual grasses along with annual and perennial broadleaf weeds to an acceptable level. The goal of this study was to move the results of this research into fields to determine if: 1) it fit into a growers schedule of production practices, 2) was economically feasible, and 3) any persistent weed problems would result from yearly use of a post-emergence weed management program.*

Rezumat. *Programele de combatere a buruienilor în plantațiile viticole sunt reconsiderate, la ora actuală, în scopul reducerii sau eliminării erbicidelor preemergente. În multe plantații viticole, managementul combaterii buruienilor pe rândul de viță de vie se bazează pe aplicarea erbicidelor preemergente primăvara, urmată de aplicarea unui erbicid postemergent în luna iunie. Utilizarea erbicidelor de contact de tipul glifosat reprezintă o tehnică alternativă la folosirea erbicidelor preemergente în plantațiile viticole. Au fost experimentate unele erbicide sistemice, aplicate în programe postemergente, în scopul managementului la un nivel acceptabil a buruienilor. Erbicidele Gramoxone, Dominator, Touchdown System 4 au asigurat controlul eficace al unor specii de buruieni anuale și perene, mono și dicotiledonate.*

INTRODUCTION

More and more vineyards are taking a hard look at their weed control programs with the aim of reducing herbicide use. More growers are using only post-emergent materials, thereby reducing or eliminating the use of pre-emergent materials.

Post-emergent herbicides are used for control of established weeds. There are two types: those that burn back the above-ground portion but typically do not kill the root and those that are absorbed and are translocated through the plant, killing the root as well. It is feasible to eliminate use of pre-emergent herbicides and control weeds with several well-timed post-emergent applications.

MATERIALS AND METHODS

Two vineyard blocks were used in this experiment. Each block contained two treatments: 1) the conventional weed management program and 2) the post-emergence weed management program. The vineyards were selected due to the persistent problem weeds. One vineyard had a problem managing *Setaria spp.* with the conventional program, and the other one vineyard had patchy problem areas of perennial weeds such *Convolvulus arvensis* and *Cirsium arvense (L.) Scop.*

It was applied the post-emergence herbicide Vegepron DS (diuron 165 g/l + simazine 80 g/l); the post-emergence herbicides Glyphos Bio (glyphosate 360 g/l), Dominator (glyphosate 360 g/l), Towchdown System 4 (glyphosate 360 g/l), when first weeds were 10-15 centimeters in height. This typically occurred during the last week in May- the first week in June. A second application was to be made when the weed regrowth reached a height of 10-15-20 centimeters, typically in mid-July.

Weed ratings were conducted in both the conventional and post-emergence plots prior to the first post-emergent application, three weeks after the first application, and three weeks after the second application. A final evaluation was conducted in first-September prior to harvest. The assessment involved identification of weed species present and the percent of ground cover each species represented. A total percent ground cover was then determined.

RESULTS AND DISCUSSIONS

The 2004 growing season was warm (as determined by accumulated growing degree days or heat units) and received ample to excessive rainfall during the summer months and a second post-emergence herbicide application was necessary; plant growth, as determined by grape vine phenology, was consistently 2 weeks ahead of a 'normal' year. The consistently early growing season are reflected in the spray records for both these blocks. Two applications of glyphosate herbicides at the 5.0 liters /ha rate were used as the post-emergence treatments in both these blocs. Applications were made on May 22 and July 15 which missed the critical stage of weed growth (15-20 centimeters) called for in the protocol.

The results of this program are still very encouraging. Not only did we see exceptional weed management using the post-emergence program in both of the blocks, there was an example of the cost-saving possibilities of this program in some years. The reduction in the amount of active ingredient applied directly to the soil is also very encouraging.

Table 1

Comparisons of Weed Species and % Cover in Conventional and Postemergence Vineyard Weed Management Programs.

Weed Species	2003		2004	
	Conv ^c	Post ^p	Conv ^c	Post ^p
<i>Digitaria sanguinalis</i> (L.) Scop.	0.2*	0	9.7	0.6
<i>Senecio vulgaris</i> L.	0	0	5.8	0.2
<i>Setaria</i> spp.	0	0	2.6	0.2
<i>Taraxacum officinale</i> Weber	0.7	0.6	2.1	0.6
<i>Daucus carota</i> L.	0.9	0.2	1.8	0
<i>Plantago maior</i> L.	0.1	0.1	1.5	0.4
<i>Abutilon theophrasti</i> L.	0	0	0.7	0.1
<i>Festuca</i> spp.	0	0	0.6	0
<i>Echinochloa crus-galli</i>	0	0	0.5	0.5
<i>Amaranthus</i> spp.	0.1	0.1	0.4	0
<i>Solanum nigrum</i> L.	0	0	0.3	0
<i>Plantago lanceolata</i> L.	0.1	0	0.3	0
<i>Polygonum</i> spp.	0.1	0	0.1	0.3
<i>Stellaria media</i> L. Vill	0.3	0.2	0.2	1
<i>Poa annua</i> L.	0	0.1	0	0.8
<i>Sorghum halepense</i> (L.)Pers.	0.1	0.2	0	0
<i>Sonchus arvensis</i> L.	0.1	0	0	0
<i>Convolvulus arvensis</i> L.	1.9	2.0	0	0
Total Weed Cover	4.60	3.50	26.60	4.70

* Percent ground cover calculated over entire treatment block. Conventional Program^c Post Emergence Program^p

There are several ways to evaluate the use of pesticides in vineyards. One common method is to examine the amount of active ingredient applied for the total pesticide program. The postemergence weed management program greatly reduced the amount of active ingredients applied to vineyards in the experiment. The total amount of active ingredient applied due to herbicide use was 20% lower with the postemergence program when compared with the growers traditional herbicide program (3.25 kg. a.i. /ha sprayed vs. 4.0 kg. a.i. a.i./acre sprayed).

Table 2

Comparison of Herbicide Rates of a Conventional and Postemergence Herbicide Program in Valea Călugărească

Treatment	Date	Herbicide	Rate
2003 Conventional	March 6	Vegepron DS	6.0 L/ha*
	June 16	Glyfos Byo	5.0 L/ha
	August 25	Dominator	2.0 L/ha (spots)
2003 Postemergence	June 5	Dominator	5.0 L/ha
	July 25	Dominator	4.0 L/ha
2004 Conventional	March 11	Vegepron DS	6.0 L/ha
	June 14	Dominator	5.0 L/ha
	August 9	Dominator	2.0 L/ha (spots)
2004 Postemergence	May 21	Dominator	5.0 L/ha
	July 15	Touchdown System 4	5.0 L/ha

* Per hectar sprayed

It is important to realize that the term, per hectare sprayed, is used due to herbicide applications being made only to the herbicide strip under the vine. The total area covered by the herbicide strip, in a particular hectare, will vary due to width of the strip and the distance between rows. In general, a grower in the Dealu Mare region will cover 2.5 to 3 hectares of vineyard before applying herbicide to an area equal to an actual hectare of land.

CONCLUSIONS

It is feasible to eliminate use of pre-emergent herbicides and control weeds with several well-timed post-emergent applications. Dense stands of grasses such as *Digitaria sanguinalis* (L.) Scop. and *Agropyron repens* (L.) P.B. are particularly hard to control post-emergent.

Glifosate provided excellent management of foxtail and velvetleaf

REFERENCES

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