

RESEARCH WITH CLASSICAL HERBICIDES AND NEW HERBICIDES (MERLIN DUO AND GARDOPRIM PLUS GOLD) APPLIED ON THE CHERNOZEM FROM FUDULES FETESTI AND THE BOWN SOIL - LUVIC FROM STEFANESTI ARGES

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In order to fight the perennial monocotyle weed as those from the gender Agropyron (Elymus), Cynodon, Andropogon, and the best results in our country were obtained with the herbicides Fusilade, Focus, Targa, Gallant, etc. But the vineyards in all the hills planted with vines in Romania are infested also with perennial decotyle from the Convolvulus, Cirsium, Sonchus, Taraxacum genders, etc. Once Romania enters the European Union, the Romanian vine growers will not be able to use the atrazin and simazin-based classical herbicides. What can they be replaced with? In the relative report one demonstrates the new herbicides, Merlin Duo and Gardoprim Plus Gold, have the same efficacy as the classical ones. For 10 years, at ICCP Fundulea, various herbicides based on atrazi, alachlor, ametrin, cycloxydym, diphenamid, fluroxypir, linuron, metalochlor, oxadiazon, pendimethalin, limazin, terbutryn, terbuthylazin etc. have been experimented. The best results in fighting the annual monocotyle and decotyle weeds have been obtained in the variants treated with atrazin and simazin-based herbicides. The following herbicides have been experimented on the black earth from Fetesti, county of Ialomita: Simarex 500 SC which contains 500 g/h of simazin; Merlin Duo, which contains 37,5 g/h isoxaflutol + 375 g/l terbuthylarin; Gardoprim Plus Gold, which contains 342,3 g/l S - metalochlor + 187,5 g/l terbuthylazin; Glyphogan, which contains 360 g/l glyphosates. The best results in fighting the annual and perennial weeds from the Agropyrum, Cynodon, Setaria, Echinochloa, Amaranthus, Chenopodium, Solanum Sonchus, Cirsium, Polygonum, Taraxacum were obtained with the herbicides Marlin Duo and Gardoprim Plus Gold applied pre-emergently and post-emergently with the Glyphogan herbicide. At these variants the fighting of the annual and perennial weed species was of 96 - 100 % according to applied doses. The same results as regards the fighting of the annual and perennial weeds were obtained with the Simanex 500 SG

herbicides applied pre-emergently and then post-emergently with the Glyphogan herbicide. As regards these variants also, the fighting of the annual and perennial weeds was of 94%. The same herbicides were experimented on the brown luvic soil from the Stefanesti-Arges site as from Agrofam Fetesti, county of Ialomita. On the basis of the researches carried out; the authors drew the conclusion that the new herbicides, Merlin duo and Gardoprim Plus Gold can replace the atrazin and simazin-based herbicides.

Keywords: *Merlin Duo, Gardoprim Plus Gold, Simazin, European Union.*

Numerous researchers dealt with the problem of weed control in viticulture from Europe. Rouas [7] applied with good results the new association of norflurazon for controlling the annual weeds from the vine. In France, Montary [5] obtained very good results in controlling weeds using the herbicide based on sulphosates. Magnen and col. [4] obtained very good results using the association of herbicides norflurazon + diuron for controlling the weeds in the vineyard. Very good results in controlling the annual weeds were obtained by Poessel and col. [6] using an association of herbicides Diuron 2000 g/ha + 1800 g/ha of pendimethalin at the Station of the Atochem Agri Company. Also, Beraud and col. [21] obtained remarkable results using the herbicides associated based on sulphosates and flazasulfuron. Labone and Capou [3] used for the vine a new molecule of synthesized flumioxazin for the grape vine.

Table 1

The efficacy of herbicides for control of annual and perennial weed at the National Research Institute-Development for Biotechnologies in Horticulture Stefanesti - Arges variety Aligote 1980- 1984

Species of dominant weeds					
1. <i>Agropyron repens</i>		6. <i>Sorghum halepense</i>			
2. <i>Stelaria viridi</i>		7. <i>Taraxacum officinale</i>			
3. <i>Stelaria media</i>		8. <i>Absiplex talasica</i>			
4. <i>Amaranthus retroflexus</i>		9. <i>Asistolochia clematitis</i>			
5. <i>Fterigeron Canadensis</i>					
Herbicides	Rate kg, l/ha	Time of application	Weed control %	Yield	
				Kg/ha	%
1. Control - 3 hoeings	-	-	95	25.900	100
2. Control - not hoed	-	-	0	17.300	67
3. Gesatop 50 WP	6.0	preem	58	20.200	78
4. Gesatop 50 WP + Fusillade	6.0	preem	80	22.200	83
	4.0	postem			
5. Gesatop 50 WP + Fusillade	6.0	preem	76	23.600	91
	6.0	postem			
6. Gesatop 50 WP + Roundup	6.0	preem	100	26.200	101
	10.0	postem			

In Romania there have also been made numerous experiments with herbicides for controlling the weeds from the grape vine. The first experiments with herbicides on the grape vine were made by Alexandri and Condei [1] with the herbicide Gesatop 50 WP. Sarpe [8], in the experiments executed at Fudulea in the

years 1965-1966 obtained the best results by using the herbicides Gesatop 50 WP and Gesaprim 50 WP, based on simazin and atrazin. On the un-hoed proof the grapes production on average for 2 years was of 10.200 kg/ha, and the variant treated with Gesatop 50 WP in doses of 9 kg/ha the grapes production was of 17.200 kg/ha. The remarkable results in controlling the weeds, including the couch-grass were obtained by Sadulescu and Radulescu using the herbicide Gesatop 50 WP in doses of 6 kg/ha applied pre-emergently and then Fusilade applied post-emergently in doses of 4-6 liters/ha. In table 1 there are presented the results from the National Research Institute - Development for Biotechnologies in Horticulture Stefanesti - Arges. Analyzing the data from table 1 we find that in controlling all the species of annual and perennial weeds the best results of 100% were obtained by treating with Gesatop 50 WP in dose of 6 kg/ha early in the spring and then on the vegetation with Roundup in dose of 10 l/ha when the perennial weeds (*Agropyron repens* and *Sorghum halepense*) had different heights 10-30 cm.

MATERIAL AND METHOD

With the new herbicides Merlin Duo and Gardoprim Plus Gold 500 SC there have been executed experiments at Agrofam Holding Fetesti the county of Ialomița with the type of Feteasca Regala placed on the chernozem soil that contains 3,9% humus and 31,2 % clay. At the National Research Institute - Development for Biotechnologies in Horticulture Stefanesti - Arges the experiment was executed at the type Merlot placed on the soil that contains 2% humus and 43 % clay.

In both localities the experiments were executed according to the method of randomized block in 4 repeating patterns with plot surface of 50 m².

For weed control of perennial and annual weeds one used the following herbicides:

1. MERLIN DUO - which contains 27,5 isoxaflutol and 1000 g/l terbutylazin
2. GARDOPRIM PLUS GOLD 500 SC - which contains 187.5 g/l terbutylazin and 342.5 g/l S - metolachlor.
3. SIMANEX 50 SC- which contains 500 g/l simazin.
4. GLYPHOGAN - which contains 360 g/l glyphosate.
5. SELECT SUPR - which contains 120 g/l clethodim.

After the use of the herbicides one made periodical observations regarding the selectivity of the herbicides towards the vine and the efficacy in the weed control.

RESULTS AND DISCUSSIONS

Analyzing the data presented in table 2 one finds that all the herbicides The Merlin Duo, Gardoprim Plus Gold and Simandon were very well tolerated by the Feteasca Regala Sort - for the entire development of the vegetation from the appearance of the first leaves one registered no symptoms of fitotoxicity.

In the weed control of the annual monocotyledonate and dicotyledonate the results were very different, depending on the doses applied per ha. For example for the variant treated with Merlin Duo in the dosage of 2 liter/ha the weed control were of 60% and when on increased the dosage of 3 liters /ha they grew to 96% and with the dosage of 6 liters/ha of Merlin Duo the control grew to 100%.

Table 2

**The selectivity and efficacy of herbicides used on vigne of the Feteasca regala
sort at Agrofam - Holding, Fetesti, the Ialomita County**

<i>The species of dominant weeds</i>				
1. <i>Agropyrum repens</i> (60%) 2. <i>Cynodon dactylon</i> 3. <i>Setaria glauca</i> 4. <i>Setaria viridis</i> 5. <i>Echinochloa crus - galli</i> 6. <i>Amaranthus retroflexus</i> 7. <i>Chenopodium album</i> 8. <i>Solanum nigrum</i> 9. <i>Convolvulus arvensis</i> 10. <i>Sonchus arvensis</i> 11. <i>Sonchus oleraceus</i> 12. <i>Cirsium arvense</i> 13. <i>Polygonum convolvulus</i> 14. <i>Taraxacum officinale</i>				
Herbicides	Rate l/ha	Time of application	Selectivity Scale EWRS	Weed control %
1. Control I - 5 hoeings	-	-	1.0	7.4
2. Control II - not hoed	-	-	1.0	0
3. Merlin Duo + Glyphogan	2.0 6.0	preem postem	1.0	60
4. Merlin Duo + Glyphogan	3.0 6.0	preem postem	1.0	86
5. Merlin Duo + Glyphogan	6.0 6.0	preem postem	1.0	100
6. Simadon 500 SC + Glyphogan	7.0 6.0	preem postem	1.0	97
7. Gardoprim Plus Gold + Glyphogan	5.0 6.0	preem postem	1.0	90
8. Gardoprim Plus Gold + Glyphogan	7.0 6.0	preem postem	1.0	100
9. Glyphogan	6.0	postem	1.0	70

Table 3

**The selectivity of the various herbicides applied on the vigne, Merlot
sort at NRIDBH Stefanesti - Arges 2007**

Herbicides	Rate l/ha	Time of applic.	Selectivity EWRS 90 after treatment:		
			30 days	60 days	90 days
1. Control I - 4 hoeings	-	-	1.0	1.0	1.0
2. Control II - not hoed	-	-	1.0	1.0	1.0
3. Merlin Duo + Select Super	3.0	preem	1.0	1.0	1.0
	3.5	postem	1.0	1.0	1.0
4. Merlin Duo + Select Super	6.0	preem	1.0	1.0	1.0
	3.5	postem	1.0	1.0	1.0
5. Gardoprim Plus Gold + Select Super	5.0	preem	1.0	1.0	1.0
	3.5	postem	1.0	1.0	1.0
6. Gardoprim Plus Gold + Select Super	10.0	preem	1.0	1.0	1.0
	3.5	postem	1.0	1.0	1.0
ERWS Notes: 1-without fitotoxic symptoms 5- the yellowing of the leaves and the stagnation of the growth of the stems. 9- the drying o the plants (the grape vines) in proportion of 75-90%					

With Gardoprime Plus Gold herbicide one obtained similar results. For the variant treated with Gardoprime Plus Gold in a rate of 5 liters/ha the weed control were of 90% and the dosage of 7 liters/ha was of 100%. So one may state that the Merlin Duo and Gardoprime Plus Gold herbicides had practically a similar efficacy with that of the Simanex herbicide. After using the Roundup herbicide one carried out a very good weed control of perennial from the group of monocotyledonates and dicotyledonates group. But, after 40 days since the treatment as a result of the rains that fell there appeared numerous species of annual weeds. That's why the degree of weeding in September was of 70% in the variant no. 9.

The results obtained at the National Research Institute - Development for Biotechnologies in Horticulture from Stefanesti - Arges are presented in table no. 3.

According to the data presented in the table 3 the herbicides Merlin Duo and Gardoprime Plus Gold applied on double doses 6 respectively 10 liters per hectare did not cause fitotoxic symptoms at the Merlot sort.

Table 4

The efficacy of the various herbicides applied on the vine Merlot sort at NRIDBH Stefanesti - Arges 2007

<i>The species of dominant weeds</i>					
1. <i>Cynodon dactylon</i> 80%	6. <i>Portulaca oleracea</i>				
2. <i>Chenopodium album</i>	7. <i>Xanthium strumarium</i>				
3. <i>Agropyron repens</i>	8. <i>Galium aparine</i>				
4. <i>Setaria spp</i>	9. <i>Matricaria chamomilla</i>				
5. <i>Echinochloa crus - galli</i>					
Herbicides	Rate l/ha	Time of applic.	Weed control after treatment:		
			30 days	60 days	90 days
1. Control I - 4 hoeing	-	-	93	90	88
2. Control II - not hoed	-	-	0	0	0
3. Merlin Duo + Select Super	3,0 3,5	preem postem	87	80	90
4. Merlin Duo + Select Super	6,0 3,5	preem postem	99	100	100
5. Gardoprime Plus Gold + Select Super	5,0 3,5	preem postem	88	85	80
6. Gardoprime Plus Gold + Select Super	10,0 3,5	preem postem	100	100	100

The Merlin Duo herbicide applied in dose of 3 liters/ha and Gardoprime Plus Gold in dose of 5 liters/ha controlled species of annual weeds in proportion of 80%. Both herbicides Merlin Duo and Gardoprime Plus Gold applied in double doses had efficacy in controlling the annual mono and dicotyledonate weeds in proportion of 99-100%. Merlin Duo and Gardoprime Plus Gold herbicides did not any efficacy over the species *Cynodon dactylon* and *Agropyron* because it is known that the respective herbicides did not control the species of perennial monocotiles. But the Select Super herbicide applied in doses of 3,5 liters/ha had a good efficacy over the two species. In table 5 are presented the grapes yields.

As you can see the grapes yield was closely related to the degree of controlling of the weeds at the variants treated with herbicides. The grapes yields at the variants treated with Merlin Duo and Gardoprime Plus Gold are practically equal

- the differences being within the limit of the experimental errors. It is worth mentioning the fact that at the witness variant not hoed the grapes yield was very small - only 2780 kg/ha - so due to the strong infesting with *Cynodon dactylon* the grapes yield was diminished with 91.7 % in comparison to the grapes yields obtained at the variants treated with Merlin Duo and Gardoprim Plus Gold.

Table 5

The grapes yields at the Merlot sort treated with various herbicides at NRIDBH Stefanesti - Arges 2007

Herbicides	Rate l/ha	Time of applic.	Yield	
			Kg/ha	%
1. Control I - 4 hoeings	-	-	8340	100.0
2. Control II - not hoed	-	-	2780	8.3
3. Merlin Duo + Select Super	3.0	preem	8440	101.0
	3.5	postem		
4. Merlin Duo + Select Super	6.0	preem	8720	104.0
	3.5	postem		
5. Gardoprim Plus Gold + Select Super	5.0	preem	8380	100.4
	3.5	postem		
6. Gardoprim Plus Gold + Select Super	10.0	preem	8740	100.7
	3.5	postem		

CONCLUSIONS

1. The Merlin Duo and Gardoprim Plus Gold 500 SC are also selective for vine.
2. The Merlin Duo and Gardoprim Plus Gold 500 SC may successfully replace the herbicides based on simazin which will be forbidden for use beginning with 2007 after Romania joins the European Community.
3. The Merlin Duo and Gardoprim Plus Gold 500 SC have similar efficacy in the control of the annual weeds (monocotyledonates and dicotyledonates) as the herbicides based on simazin, but in lower dosages.

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