RESULTS REGARDING THE INFLUENCE OF CLIMATE CONDITIONS OF THE YEAR 2019 ON THE DYNAMICS OF THE ATTACK OF PATHOGENS FROM THE VINE CROP OF THE SEGARCEA WINE FARM, ARCHDIOCESE CRAIOVA, DOLJ COUNTY

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ABSTRACT

Craiova's Archdiocese holds in the area of Segarcea 40 hectares cultivated with vine and has on its site varieties for red wines and varieties for white wines, such as: Merlot, Cabernet Sauvignon, Sauvignon Blanc, Tămâioasă românească, Chardonnay, etc.

In the climatic conditions of the year 2019, for the control of the main phytoparasites of the vine, the National Phytosanitary Authority, through the Phytosanitary Office Dolj, issued warning bulletins based on the phenological, biological and ecological criterion of the vine.

For the main phytopathogenic agents of the vine (Plasmopara viticola, Uncinula necator and Botryotinia fuckeliana), the evolution of the attack on the crop was monitored, in correlation with the climatic conditions and the way of reaction of the varieties to their attack were also monitored.

INTRODUCTION

The vine, a plant with great ecological values, during the vegetation period is attacked by several main pathogens whose attack, in the absence of the phytosanitary treatments can endanger not only the production of the current year but even the existence of the vineyards (Ilișescu Isabela, 2004, Tomoioagă et al., 2006).

The downy mildew, powdery mildew and gray mold, caused by the pathogens *Plasmopara viticola, Uncinula necator* and *Botryotinia fuckeliana* are the three diseases encountered in all vineyards, on all varieties of *Vitis vinifera*, whose attack in favourable environmental conditions, can be materialized in damage significant from the economic point of view (Mitrea and Tudose, 2011).

Cebeanu et al., 2007, Ion Roșca, 2018, recommend for the success of the control programs, that they be based on the knowledge of the reaction of the varieties to the attack of each pest organism, and the warning of the treatments should be based on the concomitant use of the biological, ecological and phenological criteria.

Badărău et al., 2007, recommends for obtaining high quality and good harvests, that the treatments against the pests in the vine plantations should be done strictly adhering to the recommended doses and the application techniques, while Tomoioagă et al., 2006, recommends for the successful control, to be applied at the farm level, depending on the microclimate and the biological resistance of the harmful organisms.

MATERIAL AND METHOD

In order to combat the pests in the Segarcea wine plantation, Craiova Archdiocese, a series of products have been applied in the treatment scheme presented in table 1.

The 7 treatments within the treatment scheme were applied to the following dates: 6.05.2019; 27.05.2019; 9.06.2019; 26.06.2019; 10.07.2019; 24.07.2019; 3.08.2019.

Treatment scheme applied in 2019 in the Segarcea winery, Craiova Archidiocese

Table 1

No. treatment	Used product	Active substance %	Dose/ha	Target organism
1	Dithane M 45 + Microthiol Special + Nissorun 10 WP	Mancozeb – 80% and hexamethylenetetramine - < 5%	2 kg	*Plasmopara viticola*
		Micronized sulphur -80%	3 kg	*Uncinula necator*
		Hexitiazol – 10%	0,5 kg	*Tetranycus urticae*
2	Ridomil Gold MZ 68 WG + Karathane Gold 350 EC	Mancozeb -64% and mefenoxam – 4%	2,5 kg	*Plasmopara viticola*
		Meptyldinocap - 0,35%	0,5 l	*Uncinula necator*
3	Ridomil Gold MZ 68 WG + Vivando + Mospilan 20 SG	Mancozeb - 64% and mefenoxam – 4%	2,5 kg	*Plasmopara viticola*
		Metrafenone – 35%	0.2 l	*Uncinula necator*
		Acetamiprid - 20%	0,250 kg	*Lobesia botrana*
4	Mikal flash + Teldor 500 SC + Vivando	Fosetyl – 50% and folpet – 25%	3 kg	*Plasmopara viticola*
		Fenhexamid - 50%	1 l	*Botryotinia fuckeliana*
		Metrafenone – 35%	0.2 l	*Uncinula necator*
5	Mikal flash + Flint Max 75 WG	Fosetyl – 50% and folpet – 25%	3 kg	*Plasmopara viticola*
		Trifloxystrobin – 25% and tebuconazole -50%	0,17kg	*Uncinula necator*
6	Funguran + Microthiol Special	Copper hydroxide - 77%	2 kg	*Plasmopara viticola*
		Micronized sulphur -80%	3 kg	*Uncinula necator*
7	Bouille Bordelaise – Zeama bordeleza WDG + Microthiol Special + Cantus	Neutralized copper sulphate - 80% and copper – 20%	5 kg	*Plasmopara viticola*
		Micronized sulphur - 80%	3 kg	*Uncinula necator*
		Boscalid - 50%	1 kg	*Botryotinia fuckeliana*

The estimation of the attack produced by the micromycetes *Plasmopara viticola, Uncinula necator* and *Botryotinia fuckeliana*, was performed on the leaves and bunches as appropriate, according to the methodologies used in the Forecast and Warning Stations.

For each pathogen, within each variety, the frequency (F%), intensity (I%) were established and the degree of attack (DA%) was calculated, the data collected being processed according to the usual formulas.

RESULTS AND DISCUSSIONS

In the climatic conditions of the year 2019, following the 7 treatments, as shown in table 2, the degree of attack of the *Plasmopara viticola* fungus registered different waves depending on the variety and the attacked organ.

The incidence of the attack on the leaves recorded values ranging from 20.41% in the Merlot variety to 49.91% in Tămâioasă românească, while the virulence of the attack had values between 6.7% and 11.26% in the same varieties.

After calculating the degree of attack (DA%), it can be seen that the varieties with the best reaction to the attack on the leaves of the *Plasmopara viticola* fungus were Merlot and Cabernet Sauvignon, at the opposite pole being the varieties for white wines, in which the maximum value of the degree of attack was 5.62% (Tâmăioasă Românească).

The attack on the bunches manifested with a lower incidence and virulence, the maximum degree of attack being 2.94% (Tămâioasă Românească), and the minimum 0.72% (Merlot).

The year 2019, characterized as a warm year but rich in precipitation, was less favourable for the development of the *Uncinula necator* pathogen, so that the 7 treatments applied during the vegetation period controlled the powdery mildew (table 3).

For red wines, DA values on leaves were between 0.21% for Merlot and 0.35% for Cabernet Sauvignon, while for white wines, they were slightly higher, by 0.84% in the Sauvignon Blanc variety, respectively 1.02% in the Tămâioasa Românească variety.

The values of the degree of attack on bunches were slightly higher, being between 0.30% in the Merlot variety and 1.22% in the Tămâioasă românească variety.

The degree of attack regardless of the variety and the analyzed organ was influenced to a greater extent by the incidence of the attack, compared to its virulence.

Thus, the frequency of the attack (F%) on the leaves, as seen from the data in the same table, had values between 21.32% and 33.75%, while the intensity values (I%) of the attack on the leaves were between 0.98% and 3.75%.

The frequency of the attack on bunches had values between 20.42% and 25.66% respectively, and the intensity of the attack oscilated between 1.47% and 4.75%.

The analyzed vine varieties showed a weak attack of the micromycete *Botryotinia fuckeliana*, because during the period of maximum favourability (the period of accumulation of sugar in the grains) a dry weather occurred, which made the 2 preventive treatments applied in the scheme treatment have good biological efficacy (table 4).

This year, the values of the degree of attack on bunch ranged between 0.09% and 0.12% for red wine varieties and between 0.32% and 0.56% for those for white wines.

The incidence of the attack did not exceed 15%, while the virulence of the attack ranged from 0.82% to 3.73%.

The climatic conditions of the year 2019 favoured the attack of the *Guignardia bidwellii* fungus responsible for the appearance of the black rot, which was reported in all the analyzed varieties.

The introduction in the treatment scheme of the Flint Max 75 WG product in the first decade of July managed to keep the attack within limits that did not cause production losses, as happened in the wine-growing centres in Oltenia.

Biological efficacy of some products in combating downy mildew in some vine varieties

Table 2

Variety	Attack on the leaf			Attack on the bunches		
	F%	I%	DA%	F%	I%	DA%
Merlot	20,41	6,7	1,36	12,83	5,61	0,72
Cabernet Sauvignon	22,30	7,35	1,64	15,24	5,77	0,88
Chardonnay	40,79	10,54	4,30	28,32	8,96	2,54
Tămâioasă românească	49,91	11,26	5,62	25,81	11,39	2,94
Sauvignon Blanc	35,30	9,15	3,23	24,0	7,41	1,78

Biological efficacy of some products in combating powdery mildew in some vine varieties

Table 3

Variety	Attack on the leaf			Attack on the bunches		
	F%	I%	DA%	F%	I%	DA%
Merlot	21,32	0,98	0,21	20,42	1,47	0,30
Cabernet Sauvignon	21,94	1,60	0,35	20,67	2,18	0,45
Chardonnay	24,52	3,75	0,92	22,32	4,35	0,97
Tămâioasă românească	33,75	3,02	1,02	25,66	4,75	1.22
Sauvignon Blanc	30,24	2,78	0,84	25,21	3,49	0,88

Biological efficacy of some products in combating gray mold in some vine varieties

Table 4

Variety	Attack on the bunches		
	F%	I%	DA%
Merlot	11,01	0,82	0,09
Cabernet Sauvignon	12,12	0,99	0,12
Chardonnay	13,24	2,42	0,32
Tămâioasă românească	15,00	3,73	0,56
Sauvignon Blanc	13,99	3,36	0,47

CONCLUSIONS

The experience area is characterized by ecopedological conditions favourable to the cultivation of vine but also to the development of key pathogens for this plant (*Plasmopara viticola*, *Uncinula necato*r and *Botryotinia fuckeliana*).

The 5 varieties of vines studied under the direct influence of the applied treatment scheme and the climatic conditions, behaved differently at the attack of the 3 pathogens.

Of the group of varieties with higher values of the degree of attack in the case of the phytoparasite *Plasmopara viticola*, Tămâioasă Românească and Chardonnay are included.

Good resistance to the attack of the *Uncinula necator* pathogen not only on the leaves but on the bunches, especially the Merlot and Cabernet Sauvignon varieties, and since it concerns the attack on grains of the micromycete *Botryotinia fuckeliana*, this was a subunit of all the analyzed varieties.

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