RESULTS ON COMBATING THE MAIN DISEASES AND PESTS OF GRAPES IN THE VINEYARD AGRO-CLIMATIC CONDITIONS DEALU BUJORULUI

REZULTATE PRIVIND COMBATEREA PRINCIPALELOR BOLI ȘI DAUNATORI AI VIȚEI DE VIE IN CONDIȚIILE AGROCLIMATICE DIN PODGORIA DEALU BUJORULUI

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Abstract. *The research was conducted in 2012 at SCDVV Bujoru where a program has been tested against the main diseases and pests of vines. The program introduced last generation pesticides such as Mikal Flash, Profiler 71 WG, Flint Max, Melody Compact 49 WG, Mega Decis EW 50 etc. These plant protection products applied in a limited number of treatments provided a great effectiveness in combating the main pathogens and pests in the vineyard.*
Key words: *grapevine, pathogens, vineyard*

Rezumat. *Cercetările s-au desfășurat în anul 2012 la S.C.D.V.V. Bujoru unde a fost experimentat un program de combatere a principalelor boli și dăunători ai viței de vie în care au fost introduse pesticide de ultimă generație cum ar fi: Mikal Flash, Profiler 71 WG, Flint Max, Melody Compact 49 WG, Decis Mega 50 EW etc. Aceste produse fitosanitare aplicate într-un număr redus de tratamente au asigurat o eficacitate deosebită în combaterea principalilor agenți patogeni și dăunători din plantațiile viticole.*
Cuvinte cheie: *vița de vie, agenți patogeni, podgorie*

INTRODUCTION

After certain pathogens and pests from the American continent penetrated the vine growing countries in Europe, the growers, both practitioners and researchers, have equally sought ways and means to prevent and effectively fight them. In the vine growing technology, the fight against pathogens and pests is one of the crucial technological links for obtaining high yields of grape and high quality wine (Teodorescu et al., 2003, Ulea, 2005).

The emergence and evolution of the main pathogens and pests of wine grapes in the Dealu Bujorului vineyard area is influenced by direct and indirect effects of technological and ecological factors specific to this area, affecting the quality and quantity of grape production (Tabaranu and Simion, 2005).

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MATERIAL AND METHOD

The research was conducted at the Bujoru Research and Development Station for Viticulture and Winemaking in a vineyard cultivated with Feteasca Regala and Aligoté aged 32 years.

The experiment was conducted on a land surface with a slope of 3-5%, chernozem soil type, with a humus content between 1.14 to 1.86% in the A horizon with a weak alkaline reaction (pH 7.44 to 8.30) and a sandy loam texture; with the land surface facing east and about 170-200 m altitude. The rows' orientation was north to south, with a planting distance of 2.1 m x 1.2 m, and a provided density of 3968 vines / hectare. The rootstock used was Berlandieri x Riparia rootstock, Teleky 8 B and Openheim SO4-4 selection.

The experiment involved the following varieties:

- Fetească regală
- Aligoté
- The Witness/ The Untreated Lot

To determine the gravity of the attack produced by the main vine diseases such as manna, powdery mildew, and gray rot, observations have been conducted on the intensity (I) the frequency (F) and the degree of the attack (AD/GA%) upon the leaves and grapevine (Mirica and Mirica, 1976).

RESULTS AND DISCUSSION

Under the climatic conditions of the growing season of 2012, six phytosanitary treatments for combating pathogens and pests of vine have been administered.

Scheme for combating pests and diseases of the grapevine products from Bayer CropScience company *:

I. After debudding, shoots 10-15 cm: powdery mildew (Sulfavit 80 PU - 4,0 kg/ha)

II. Shoots of 30-50 cm: manna (Mikal Flash* - 3,0 kg/ha) and powdery mildew (Sulfavit 95 PP - 10 kg/ha);

III. Before flowering (treatment of safety): manna (Profiler 71 WG* - 2,25 kg/ha), powdery mildew (Flint Max* – 0,16 kg/ha) and the grapes moth (Decis Mega 50 EW* - 0,2l/ha);

IV. After blooming (treatment of safety): manna (Verita - 2,0 kg/ha), powdery mildew (Folicur Solo 250 EW - 0,4 l/ha) and gray rot (Teldor 500 SC* - 1,0 l/ha);

V. The grape growth (berries the normal size): manna (Eclair 49 WG* - 0,5 kg/ha) and powdery mildew (Sulfavit 80 PU - 4,0 kg/ha);

VI. Compaction of grape bunches : manna (Melody Compact 49 WG* -1,5 kg/ha), powdery mildew (Falcon 460 EC - 0,3 l/ha) and powdery mildew (Rovral 500 SC* - 1,0 l/ha);

VII. Entering the first fruits period: due to the adverse climatic conditions (prolonged drought, high temperatures, etc.) the treatment was canceled because it was not economically justified.

The treatments were performed at warning using MPSP machine 3-300 and the products were complex depending on the pathogens that have been targeted.

The quantity of 400 l/ha of solution has been used for the first two treatments while the following treatments used a quantity of 900-1000 l/ha of the same solution.

To describe the specific microclimate conditions of the Dealu Bujorului vineyard, the weather data recorded at the Bujoru SCDVV meteorological station have been used. During the vegetative rest period, the absolute minimum temperatures have dropped below the frost resistance threshold of the vine (-18,0°C). On 11.02.2012 the recorded temperature dropped to – 22, 0°C, which means that the temperature has affected the viability of the vine buds in the experimental lots. The spring season climate conditions were unusual for that period of time as the average temperatures were higher than the normal ones and, overall, the average of the monthly temperatures was higher by 5, 3°C than the normal temperature of that period. During June and July frequently elevated temperatures of over 35,0°C have been recorded as follows: 37,6°C on 22.06.2012 and 38,0°C recorded for four consecutive days (26,28,29,30.08.2012). The absolute maximum temperature was 41,7 °C recorded during the summer, more precisely on 07.08.2012. In the recent years, the most obvious weather phenomenon was drought which has become most common. Monitoring this phenomenon implies the knowledge of the total annual precipitations, of the specific periods of the year when the lack of precipitation was as its peak or when the precipitation was insufficient and to compare these values to the multiannual average.

The year of 2012 was an extremely droughty year, in which vines experienced a decrease in the precipitation amount with an uneven distribution of precipitation, with long dry periods. The active vegetation period started with elevated precipitations but unevenly distributed over time. Also during this period, the precipitations exceeded the monthly average rainfall, thus the records showed a surplus of 27, 1 mm from March to May. Regarding the evolution of rainfalls, it can be noticed an uneven distribution of these throughout the vegetation period, with a surplus in May (71,0 mm to 31,2 mm annual average), and in June, July and August with a pronounced deficiency of 106,2 mm. Table 1 presents data about the relative humidity, insolation etc.. The average air hygroscopicity has registered low values compared to the monthly average ones, and annual insolation was 1889, 5 h compared to the multiannual one which was 1661, 9 h.

The pluviometric deficiency started as early as March when were registered 9,2 mm compared to 25,5 mm, the annual average, except for the month of May when precipitations were in excess. Combined with insufficient precipitations, excessive temperatures, higher than the multiannual one, have led to the installation both, the atmospheric and pedological drought. Throughout the vegetation period, the air temperature was higher than its multiannual average. The extreme temperature values had a huge contribution to the atmospheric drought. Ever since the end of April, air temperatures higher than 30°C have been recorded. Thus, in April were recorded 3 such days, in May 6 such days, in June 17 such days and in July 27 such days. The high temperatures, combined with the lack of precipitations, have

led to low air humidity that impacted the experimental batches. Under these climatic conditions, the vine varieties from the experimental lots have suffered from the lack of rain, and so the grapes have withered, the leaves have partially or totally dried and fell, and, therefore, the grape production decreased considerably.

The vines manna (*Plasmopara viticola* - Berk. Et Curt.): The climatic conditions of 2012 were unfavorable to the emergence and the evolution of vines manna. Thus, during the vegetation period, the manna evolution was insignificant (table 2).

The vines mildew (*Uncinula necator* - Schw. Burr.): During the growing season, the pathogens registered a number of 15 generations, with a lifetime period of 11 days in April, May, and June and 13-21 days in July and August. Among weather conditions favorable for the emergence and evolution of vines powdery mildew, air temperature held a decisive role. The limits are large, basically from 10°C, the biological threshold of vines, to 30°C, while the optimal range is to about 22-26 °C. The extension of the evolution of a generation to 21 days was due to the surpassing of the common biological threshold of 30 °C in July-August. During the growing season, the pathogen was weak, due to the application of phytosanitary treatments at the optimum moment, with specific products. In late blooming, varieties included in the study registered a degree of attack (GA %) on leaves between 0,04 to 0,07% and in the berries' growth phenophase, between 0.05 to 0.10%. In the **Witness - untreated** lot, the attack degree of leaves was 0.21% at the end of flowering and 0.24% during the berries growth (table 3).

Table 1

Weather data from the period of 01.XI.2011 – 31.10.2012

Month of year	Monthly average (t ºC) Average of the month		Precipitations (mm)		Hygroscopicity humidity (%)		Insolation (h)	
	the normal	2011 2012	the normal	2011 2012	the normal	2011 2012	the normal	2011 2012
XI.2011	4,8	3,4	34,9	0,0	83	62	52,3	49,8
XII.2011	1,7	3,2	28,6	8,8	88	68	30,7	20,0
I.2012	-1,7	-1,3	13,8	34,6	87	63	41,2	68,9
II.2012	2,0	-7,0	13,6	21,1	79	63	80,4	72,2
III. 2012	5,5	6,0	24,2	6,1	75	52	106,5	176,6
IV.2012	11,2	14,9	40,4	14,6	70	49	142,2	209,1
V.2012	18,6	19,7	31,2	102,2	62	53	237,1	181,6
VI.2012	22,6	24,3	53,2	11,9	62	46	236,8	312,6
VII.2012	24,9	28,1	54,9	27,1	63	41	251,3	337,5
VIII.202	23,2	26,1	61,7	23,1	66	43	226,4	286,0
IX.2012	17,2	20,7	47,2	24,6	73	50	150,9	226,0
X.2012	11,6	14,6	34,9	42,0	78	59	106,1	134,0
Sum	**141,6**	**152,7**	**438,6**	**316,1**	**886**	**649**	**1661,9**	**2074,3**
Averge	**11,8**	**12,7**	**-**	**-**	**73**	**54**	**-**	**-**

Table 2

The situation concerning the vines manna attack *Plasmopara viticola* (Berk. et Curt.) at S.C.D.V.V Bujoru 2012

Variety	After blooming		Berries growth		Firstfruits grapes		Technological maturity	
	leaves	Grapes	leaves	Grapes	leaves	Grapes	leaves	Grapes
	G.A %	G.A %	G.A %	G.A %	G.A %	G.A %	G.A %	G.A %
Fetească regală	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Aligoté	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Witness - untreated	**0,0**	**0,0**	**0,30**	**0,04**	**0,0**	**0,0**	**0,0**	**0,0**

Table 3

The situation of the grapevine mildew attack *Uncinula necator* (Schw. Burr) at S.C.D.V.V Bujoru in 2012

Variety	After blooming		Berries growth		Firstfruits grapes		Technological maturity	
	leaves	Grapes	leaves	Grapes	leaves	Grapes	leaves	Grapes
	G.A %	G.A %	G.A %	G.A %	G.A %	G.A %	G.A %	G.A %
Fetească regală	0,04	0,0	0,10	0,0	0,0	0,0	0,0	0,0
Aligoté	0,07	0,0	0,05	0,0	0,0	0,0	0,0	0,0
Witness - untreated	**0,21**	**0,0**	**0,24**	**0,18**	**0,0**	**0,0**	**0,0**	**0,0**

Table 4

Situation concerning the grapes gray rot attack (*Botrytis cinerea* - Pers.) at S.C.D.V.V Bujoru 2012

Variety	After blooming		Berries growth		Firstfruits grapes		Technological maturity	
	leaves	Grapes	leaves	Grapes	leaves	Grapes	leaves	Grapes
	G.A %	G.A %	G.A %	G.A %	G.A %	G.A %	G.A %	G.A %
Fetească regală	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Aligoté	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Witness - untreated	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**

Gray rot of grapes (*Botrytis cinerea* - Pers.)**:** Due to adverse climatic conditions in 2012 (precipitations low during the summer period, low atmospheric humidity) symptoms of pathogen attacks have not been signaled in the experimental groups (Table 4).

The Grape Moth or eudemis - (*Lobesia botrana* - Den. et Schiff.) Under the conditions of 2012, amid high biological reserves from the previous year, the grapes moth has fared weak in all three generations without surpassing the economic damage threshold (PED) of 100 - moth / trap / week.

CONCLUSIONS

1. The atypical climatic conditions of 2012 were unfavorable to the attack of cryptogamic diseases (manna and gray rot) that led to a lack of symptoms in the experimental lots.

2. The vine powdery mildew in 2012 had favorable conditions for evolution in the first part of the vegetation period; its attack manifesting weak on leaves. The pathogen was kept under control by applying phytosanitary treatments of six specific products. During the period June-July, very high temperatures have been registered, thus creating unfavorable conditions for the development of the fungus.

3. The grape moth was monitored using synthetic sex pheromone traps - type ATRABOT. These pointed to the fact that although the biological reserve of the previous year was great, the emergence and evolution of the pest in 2012 was weak and did not exceed the PED (100 catches / trap / week) in any generation.

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