

VINE'S PHYTOSANITARY CONTROL IN 2008

CONTROLUL FITOSANITAR AL VIȚEI DE VIE ÎN 2008

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Abstract. *Vine's pathogenic and deleterious agents represent the main cause of yield loss, the attack severity, in certain climatic conditions, being able to compromise the entire yearly crop. As a result, the phytosanitary vine protection research are directed today towards finding means to proficiently control the pathogenic agents, in order to obtain a maximum yield, but by preserving the natural background. Experiments conducted by S.C.D.V.V. Iasi consisted in building up an incorporated program to control the main pests and pathogenic agents, by using high-end pesticides, during 2008, which proved to be efficient, with a positive influence on crop yield.*

Key words: pathogen, pest, protection, vine.

Rezumat. *Agenții patogeni și dăunătorii viței de vie reprezintă principala cauză a pierderilor de recoltă, severitatea atacului, în anumite condiții climatice, putând compromite întreaga producție a anului. Ca urmare, cercetările de protecție fitosanitară a viței de vie sunt direcționate în prezent spre găsirea mijloacelor de combatere cât mai eficace a patogenilor, în condițiile obținerii unui maxim de recoltă, pe fondul conservării sistemului natural exploatat. Experimentarea în cadrul S.C.D.V.V. Iași a unui program de combatere integrată a principalilor agenți patogeni și dăunători, cu pesticide de ultimă generație, pe parcursul anului 2008, a asigurat o eficacitate deosebită, cu o influență pozitivă asupra producției.*

Cuvinte cheie: patogen, pesticid, protecție, vită de vie.

INTRODUCTION

In the last decades, the issue of limiting the use of pesticides has become more and more common, as a result of the fact that, besides the positive effects, the excessive use of these products can have undesired outcomes; thus, their partial replacement with other methods and means of yields protection has become compulsory.

Moreover, on the background of global climatic and implicitly local changes, at the level of biocenosis occur modifications that can determine the increase of the virulence level of certain pathogen agents.

Therefore, the researches have been focused on finding the means for obtaining the maximum of yield, in the conditions of conserving the natural exploited system.

Through the integrated control of the pathogen agents and vine pests, we aimed, within the Polygon of Plant Protection of S.C.D.V.V. Iași, at rationalizing the chemical methods, by increasing the biological and biotechnical phytoprotection share.

MATERIAL AND METHOD

The experiment was organized in the Polygon of Plant Protection of the Station of Research and Development for Viticulture and Vinification on the Aligoté variety, grafted on Kober 5BB, planted at the distance of 2.2 m between the lines and 1.2 m per line, on a surface of 3 ha, on a land with south-west exposal and slant of 5-7 %.

The crop system practiced in our area is the semi-protected one, and the soil maintenance on the intervals between the lines is alternative, black field- long duration grass overgrowing. For establishing the best moment to apply the treatment, we monitored the main climatic elements from the own meteorological platform (maximum, minimum air, soil temperature, precipitations, hygroscopticity and solarization) we monitored the growing dynamics of the sprouts and the soil phenology. Through the phytosanitary control from the polygon, we registered and evaluated the numerical density of the main pathogen agents (manna, mildew, grey rot of grapes), respectively pests (moths, acarians).

We placed pheromone traps and we established the acarians reserve from the parcel. We carried out nine treatments, on warning, using the MPSP-300 splashing pump, equipped with MVL 10.01 type nipples, at the pressure of 2,5 Bars.

In addition, we carried out all the technological works specific to the viticultural plantations (cutting, encircling and tying the chords, reviewing the support system, works for soil maintenance, clearing of weeds and management of sprouts, top removal and leaf removal, harvesting).

RESULTS AND DISCUSSIONS

During the vegetation period, the atypical evolution of the climatic factors (table 1), of the agricultural year 2007-2008, and the soil phenology (table 2) had a determinant role in appreciating the moment for applying the treatments.

The ecoclimatic conditions from the vegetation period were characterized through a heliothermal reduced regime on the background of rich hydric resources. April started with a gradual heating, and the frequent precipitations registered during 14 days have determined the triggering of non-uniform vegetation on April 18th 2008.

The month also presented under the thermal aspect a constant heating without great variations, however the precipitations from the end of the month, respectively the hailstone from May 25th 2008 imposed the necessity of a phytosanitary intervention. For the cicatrisation of wounds, we used a bordolese juice, and for combating the mildew, we used Kumulus.

The average temperature from June of 20.2^oC and the frequent precipitations registered in 10 days with rains that were not rich quantitatively, were favorable factors for the development of *Plasmopara viticola* fungus. The manna was aggressive both on the leaves and on the young inflorescences.

On the background of a great pressure of attack and of some very favorable conditions, from July, with the daily average temperatures comprised between 15.9^o C-25.4^o C and 15 days with rains, which summed up 155.2 mm, of almost 2.5 times the normal monthly value, the manna continued to be aggressive both on the young tops, on the leaves (fig. 1,2) and on the grapes and shoots).



Fig. 1 and 2. The vine manna (*Plasmopara viticola*) – attack on the leaves

Table 1

**Climatic data from Copou Iași viticultural centre
in the agricultural year 2007-2008**

| Month | Monthly average (t°C) | | Absolute max (t° C) | Absolute min (t° C) | Precipitations (l/m ²) | | Hygroscopicity (%) | | Insolation (hours) | |
|-------|-----------------------|------|---------------------|---------------------|------------------------------------|-------|--------------------|------|--------------------|-------|
| | Norm | 2008 | | | Norm | 2008 | Norm | 2008 | Norm | 2008 |
| IV | 10.1 | 10,9 | 23,1 | 1,6 | 40.3 | 99,7 | 62 | 73 | 171.3 | 136,6 |
| V | 16.1 | 15,4 | 28,2 | 5,8 | 52.5 | 64,6 | 62 | 66 | 220.9 | 243,5 |
| VI | 19.4 | 20,2 | 30,6 | 8,4 | 75.1 | 74,7 | 63 | 64 | 264.6 | 263,2 |
| VII | 21.3 | 20,9 | 34,5 | 10,8 | 69.2 | 155,2 | 62 | 64 | 294.4 | 257,6 |
| VIII | 20.6 | 21,6 | 38,0 | 8,9 | 57.6 | 70,9 | 63 | 65 | 272.2 | 309,6 |

Table 2

The phenology of Aligoté variety in the agricultural year 2007-2008

| Variety | Debudding | Flowering | Dough | Ageing | Fall of leaves |
|---------|-----------|-----------|--------|--------|----------------|
| Aligoté | 16 IV | 10 VI | 5 VIII | 15 IX | 16 X |

For comparison, we disposed of the program of splashes in a near-by parcel, cultivated with the same variety and with an untreated control variant. We have to mention the fact that, during the year 2008, the program of phytosanitary interventions for the two parcels was different (table 3, 4).

Table 3

Program of phytosanitary interventions in the demonstrative lot

| No. | Phenophase | Pathogenic agents | Recommended product | |
|-----|------------------------------------|---------------------------|---|------------------------------------|
| 1. | Debudding - Vine shoot 5-10 cm | Acarians Midlew | Calcium sulphate juice 2 % | |
| 2. | Vine shoot 10 -25 cm, 6/27.05.2008 | Manna Midlew, Moths | Verita 2,5 Falcon 0,3 Calypso 0,100 | Bordolese juice 5,0 Kumulus 3,0 |
| 3. | Before the blooming 05.06.2008 | Manna Midlew | Profiler 2,5 Folicur solo 0,4 | |
| 4. | End of blooming 13/16.06.2008 | Manna Midlew Rot | Verita 2,5 Flint max 0,180 Teldor 1,0 | |
| 5. | Growth of grapes 25.06.2008 | Manna Midlew | Eclair 0,5 Flint max 0,180 | |
| 6. | Compacting of grapes 07.07.2008 | Manna Midlew | Antracol 3,0 Flint max 0,180 | |

| | | | |
|----|--|-----------------|---------------------------------------|
| | | Rot, Moths | Rovral 1,0, Decis 0,200 |
| 7. | At 10-14 days after the last treatment 8.07.2008 | Manna Midlew | Melody Compact 1,5 Flint max 0,180 |
| 8. | Before the beginning of dough 07.08.2008 | Manna Midlew | Bordolese juice 5,0 Kumulus 3,0 |
| 9. | Beginning of dough 25.08.2008 | Rot | Mythos 3,0 |

Table 4

Program of phytosanitary interventions in the comparative parcel- Production farm – S.C.D.V.V. Iași

| No. | Phenophase | Pathogenic agents | Recommended product |
|-----|---|-----------------------|---|
| 1. | Debudding - Vine shoot 5-10 cm - 24.04.2008 | Acarians Midlew | Calcium sulphate juice |
| 2. | Vine shoot 10 -25 cm 26/27 .05.2008 | Manna Midlew | Bordolese juice Kumulus |
| 3. | Before the blooming 06.06.2008 | Manna Midlew | Ridomil Topas |
| 4. | End of blooming 19.06.2008 | Manna Midlew | Mikal, Ridomil Topas |
| 5. | Growth of grapes 08.07.2008 | Manna, Midlew, Rot | Manzate, Ridomil, Bordolese juice, Topas, Mythos |
| 6. | Compacting of grapes 28.07.2008 | Manna, Midlew, Rot | Folpan, Bordolese juice Topas, Kumulus, Mythos |

Thus, after the analyses regarding the attack of the main pathogen agents, manna, mildew (fig. 3) and the grey rot of grapes (fig. 4) we calculated the intensity, frequency and degree of attack of the pathogens, both within the demonstrative lot of the comparative parcel and of the untreated control (table 5).



Fig. 3. Mildew of *Uncinula necator* grape vine – attack on the leaves



Fig. 4. The grey rot of grapes *Botryotinia fuckeliana* – attack on the grapes

We notice the obvious difference between the values obtained in the degree of attack of the three pathogens compared to the values registered in the untreated control. Also, we notice a slight difference between the values of the attack degree registered on the comparative parcel compared to the demonstrative lot.

Table 5

Comparative results regarding the attack of the main pathogen agents

| Agents monitored | Demonstrative lot | | | Comparative parcel | | | Untreated control | | |
|-----------------------------|-------------------|-------|-------|--------------------|-------|-------|-------------------|-------|-------|
| | I % | F % | G.A. | I % | F % | G.A. | I % | F % | G.A. |
| Manna on the leaves | 21,7 | 46,55 | 10,11 | 35,65 | 74,14 | 26,36 | 64,3 | 100 | 64,35 |
| Manna on the grapes | 7,89 | 52,42 | 4,13 | 16,02 | 68,08 | 11,04 | 48,6 | 84,13 | 40,89 |
| Mildew on the leaves | 4,42 | 16,87 | 0,75 | 8,78 | 14,86 | 1,30 | 5,9 | 56,81 | 3,35 |
| Mildew on the grapes | 5,06 | 6,66 | 0,34 | 6,79 | 13,65 | 0,92 | 5,26 | 32,75 | 1,72 |
| Grey Rot on the leaves | 5,27 | 11,49 | 0,61 | 7,88 | 28,49 | 2,32 | 8,04 | 37,5 | 3,02 |
| Productions obtained (kg) | 10 000 | | | 4 500 | | | - | | |

This thing attests the fact that the fungicides used within the combating program have protected very well both the leaves and the grapes, the production obtained in 2008 in the demonstrative lot parcel being of 10 t/ha.

Table 6

The physical-chemical characteristics of the wines obtained from the Aligoté variety

| Variety | Production t/ha | Must | | Wine | |
|-----------------------------|-----------------|------------|--|---------------|--|
| | | Sugars g/l | Acidity g/l H ₂ SO ₄ | Alcohol % vol | Acidity g/l H ₂ SO ₄ |
| Aligoté- demonstrative lot | 10 | 195 | 5,2 | 11,5 | 4,8 |
| Aligoté- comparative parcel | 4,5 | 168 | 4,8 | 9,9 | 4,2 |

The production growth was of 5.5 t/ha in the variant of the demonstrative lot, as we notice from table 6 as well, the ageing of grapes occurred in an appropriate manner. Because of the healthy vegetal apparatus, a normal but superior accumulation of reducer sugars was also registered. The reduction of acidity during the period of ageing registered a decreasing, smooth evolution, ensuring a balance in conformity with the technological requirements.

On the background of a small biological reserve, the populations of tetranychidae and eriophyse Acarians (fig. 5, 6) were maintained under control and as a result of the treatment carried out at the phonological moment of sprouts of 5-7 cm, with the product calcium polysulphide.



Fig. 5 and 6. The grape vine eriosis -*Eriophyes vitis* – attack on the leaf

The flight of grape vine moths (fig. 9,10) was monitored with the help of pheromone traps (fig. 7,8) , the efficacy of insecticides Calypso and Decis 25 WG being ensured by maintaining the pests under the economic threshold of deterioration.



(7)



(8)

Fig. 7 and 8. Aspects regarding the placement of pheromone traps



Fig. 9. The green moth of *Lobesia botrana* grape vine



Fig. 10. The brown moth of *Clysia ambiguella* grape vine

CONCLUSIONS

1. Among the fungicides applied for combating the manna, the Verita fungicide in dose of 2.5 k/ha has ensured the best protection in the Aligoté variety, taken in the study.

2. The efficacy of the insecticides Calypso and Decis 25 WG have ensures the maintenance under the economic deterioration threshold of the vine grape moths.

3. The production of 10 t/ha obtained in the demonstrative lot and the production increase of 5.5 t/ha compared to the comparative parcel, to which we add the production quality, confirm the good efficacy of the products used and the importance of complying with the phytosanitary combating programs.

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