

## COMBATEREA PRINCIPALILOR PATOGENI ȘI DĂUNĂTORI LA SPECIA CIREȘ CONTROL OF THE MAIN PATHOGEN AGENTS AND PESTS IN CHERRY SPECIES

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### Abstract

In the period 2011-2013, at RSFG Iași we carried out researches regarding the control of the main pathogen agents and pests in the cherry species. The experiment took place in a cherry plantation with the varieties 'Van', 'Stela' and 'Boambe de Cotnari'. The experiments aimed at controlling anthracnose, moniliosis, the San Jose scale and the cherry fruit fly by using plant protection products such as: Signum 0.03%, Copernico 0.2%, Funguran 0.2% Decis 25 WG 0.003%, Calypso 0.02%, Rovral 0.075%, Novadim 0.13%, Decis Mega 0.0125%.

**Cuvinte cheie:** *Cocomyces hiemalis*, fertilizanți, fitoprotecție, *Rhagoletis cerasi*  
**Keywords:** *Cocomyces hiemalis*, fertilizers, phytoprotection, *Rhagoletis cerasi*

### 1. Introduction

The cherry tree is a fruit bearing species having a special economic importance due to its nutritional, technological and commercial features of fruits. At the same time, it has a significant weight in the Romanian pomiculture due to its high adaptability to the edaphic conditions from our Country (Amzăr Valentina and colab, 2003, Cârdei E., 2005; Teodorescu Georgeta and colab, 2003).

Like the other fruit bearing species, the cherry tree is attacked by numerous pathogen agents and pests such as the anthracnose of the cherry leaves, leave shot-holing, moniliosis, the cherry fruit fly, aphides, mice, the San Jose scale, etc. (Cârdei E. and colab, 2010, Sumedrea Mihaela and colab., 2009).

The prevention and control of losses caused by these pathogen agents and pests may be made only by applying a rational integrated programme that may join agro-technical, biotechnical, biological and chemical measures (Tomșa M., 2003, Minoiu N., and colab., 1987).

In the period 2011-2013, at RSFG Iași researches were carried out regarding the chemical control of pathogen agents and pests in the cherry species by using the latest generation products for plant protection.

### 2. Material and methods

The experiment took place on a cherry plantation with the varieties 'Van', 'Stela' and 'Boambe de Cotnari'. The experiments aimed at controlling anthracnose, moniliosis, the San Jose scale and the cherry fruit fly by using the latest generation of plant protection products (table 1).

The phytosanitary treatment schedule applied in the interval 2011-2013 comprised a number of 5 or even 6 treatments (in 2013), their number depending on the meteorological conditions which have a determining role in the evolution of pathogen agents and pests (table no. 2).

5-6 phytosanitary treatments were applied, and among them, one before flowering and one post harvesting.

In the period 2011-2013 the climatic conditions were different from one year to another and they provided favorable conditions for the development of pathogen agents and pests. Thus, the temperature registered very high values from one year to another as follows: the average temperature in 2011 was 9.6°C and in 2010 in was 10.1°C, the maximum temperature reaching 41.3°C in August 2011.

As for the precipitations, they registered different quantities throughout the period. For example, in 2011 they registered 435.8 l, in 2012, 447.3 l and in 2013 the quantity of precipitations increased reaching 331.0 l in the first 5 months of the year. At the same time, the number of rainy days was quite high, ranging between 8 and 15 (in 2012) and 20 days (2013) in April-June what created favorable conditions for the evolution of pathogen agents, especially moniliosis and anthracnose. This year the quantity of precipitations in May-June was much higher than in the previous years. For instance, in June they registered 113.4 l, by 80 l more than in 2012 which led to the phenomenon of cherry cracking (Fig 1).

### 3. Results and discussions

In the period 2011-2013 there were favorable conditions for the development and attack of both pathogen agents and pests in the cherry species. Thus, the phytosanitary programme used the latest generation plant protection products having a special efficiency in the control of anthracnose, moniliosis and the cherry fruit fly. Besides these pesticides, in the phytosanitary programme we also used leaf fertilizers, playing an important role in yield both from the qualitative and the quantitative point of view.

The results regarding the frequency and intensity of pathogen agents attack are given in tables 3, 4 and 5.

Following treatments, the products used to control anthracnose and moniliosis registered a high efficiency. Thus, the attack of anthracnose (*Cocomyces hiemalis*) strongly manifested in the untreated control sample with a frequency between 65.6 and 66.3% (Fig.3). By comparison to these values, fungicide Signum had a high efficiency with frequency values between 2.6 and 3.5% for 'Van' and 'Boambe de Cothari' varieties. As regard the moniliosis attack, this manifested both on shoots and fruits. For the untreated control sample, the frequency of moniliosis ranged between 35.3 and 40.8% as compared to 2.5-3.7% in the treated variants (Signum and Rovral), and on shoots, in the untreated control sample the frequency ranged between 40.4 and 42.4% as compared to 1.6-2.7% for the treated varieties.

In the 3 years of experiments, we noticed that the attack of pathogen agents was more intense in 2013 due to the precipitations which registered significant quantities in this period and favored especially the attack of moniliosis both on shoots and on fruits (Fig.4). For example, in 2013, in case of treated variants, the frequency of moniliosis on shoots for the 3 varieties registered values between 2.0-2.7%, as compared to 2012 when the values were between 1.7 and 2.0%. Approximately the same values were registered in case of moniliosis on fruits as well.

To obtain a healthy crop, leaf fertilizers also had an important role within the phytosanitary programme applied in the period 2011-2013: Feartileader BPK 0.2%, Feartileader Magical 0.2%, Boro Et 0.07%, Keramin 0.3%, and Rezistevo 0.4%. They have a high content in macro- and microelements and directly influence the evolution of cultures in terms of quality and quantity. For example, Keramin product is a complex nutrient and bio-stimulator which improves fructification, intensifies the colour of fruits, increases the sugar content and prevents the falling of fruits. At the same time, Fertileader BPK applied after flowering has a high content of boron besides the macro and microelements it contains, whereas Fertileader Magical by its high calcium content (16%) contributes to the prevention of fruit cracking. Otherwise in 2013, due to the climatic conditions, we performed a special treatment to prevent cherry cracking using products such as Rezistevo, Keramin and Copfort, the advantages of using these products being multiple: big uniform fruits, intense colour, prevention of fruit falling and cracking etc. (Fig.2).

In such conditions, very favorable for the evolution of pathogen agents, fungicides Signum and Rovral were highly efficient ensuring a good yield from both qualitative and quantitative point of view.

As for the control of *Rhagoletis cerasi* pest, this was made by means of insecticides Calypso, Decis 25 WG and Decis Mega, which proved to be highly efficient. The untreated control sample registered values between 67.3 and 75.2%, very high values as compared to the treated variants where the percentage was very low having values between 0.0% in 2013 and 1.2% in 2011.

### 4. Conclusions

The prevention and control of diseases and pests in the fruit bearing cultures represent an extremely important factor in order to fulfill the main goal, namely healthy crops, and to ensure an adequate phytosanitary status of the fruit bearing trees.

During the experimentation period we used the most recent plant protection products. The climatic conditions from this period were highly favorable for the evolution of disease attack (anthracnose and moniliosis) and less favorable for the attack of the cherry fruit fly (*Rhagoletis cerasi*).

To control diseases (moniliosis and anthracnose) the best results were obtained with Signum 0.03% (0.6 kg/ha), Rovral 0.075% (1.5 l/ha), Funguran 0.3% (4.5 kg/ha) and Copernico 0.2% (4.0 kg/ha).

At the same time, insecticides Calypso 0.02% (0.4 l/ha), Decis Mega 0.016% (0.25 l/ha) and Decis 25 WG 0.03% (0.06 kg/ha) registered high efficiency in the control of the cherry fruit fly, whereas Seizer and Novadim represented a progress in the control of San Jose scale.

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## Tables

Table 1. The phytosanitary treatment schedule applied species cherry

No. trat.	Phenophase	Pathogens and pests to control	Used Products		
			2011	2012	2013
1	Buds brake	moniliosis, leaves shot-holing, anthracnose	Funguran 0,3% (4,5 kg/ha)	Zeamă bordoleză 0,5%(7,5 kg/ha)+ Evobor0,07% (1 l/ha)	Zeamă bordoleză 0,5% (7,5 kg/ha)+ Boro Et 0,07% (1,0 kg/ha)
2	The first petals falling	anthracnose, moniliosis, insects	Signum 0,03% (0,6 kg/ha)+ Decis 25 WG 0,003% (0,06 kg/ha)+ Feartileader BPK 0,2% (4 l/ha) + Agrifol 0,2% (4 l/ha)	Signum0,03% (0,6 kg/ha + Boro Et 0,05% (1,0 kg/ha)+ Agrifol 0,2% (4 l/ha)	Signum 0,04% (0,6 kg/ha)+ Decis Mega 0,0125% (0,25 kg/ha)+Fertileader BPK 0,2%(3 kg/ha)
3	Upon first fruits ripening of the Ramon Oliva variety	moniliosis, Rhagoletis	Signum 0,025% (0,5 kg/ha) + Calypso0,02% (0,04 l/ha) Feartileader Magical 0,2% (4 l/ha) + Agrifol 0,2% (4 l/ha)	Signum 0,03% (0,6 kg/ha + Calypso 0,02% (0,4 l/ha)+ Agrifol 0,2% (4 l/ha)+Fertileader Magical 0,2% (4 l/ha)	Signum 0,04% (0,6 kg/ha)+ Calypso 0,027% (0,4 l/ha)+ Agrifol 0,3% (4,5 l/ha)+
4	7 days after the previous treatment	Rhagoletis moniliosis, anthracnose	Decis 25WG 0,003% (0,06 kg/ha)	Rovral 0,05%(1,0 l/ha)+ Decis 25WG0,003%(0,06 kg/ha)+ Agrifol 0,2%(4 l/ha)+Fertileader Magical 0,2%(4 l/ha)	Rovral 0,075% (1,5 l/ha)+ Decis Mega0,016% (0,25 l/ha)+ Agrifol 0,13% (2,0 l/ha)
5	Post-harvest	anthracnose, moniliosis, aphids	Funguran 0,2% (4,0 l/ha)+ Seizer 0,05% (1,0 l/ha)	Copernico 0,2%(4,0 kg/ha)+ Novadim Progres 0,1%(2,0 l/ha)	Keramin 0,3%(3,0 l/ha)+ Rezistevo 0,4%(4 kg/ha)+ Copfort 0,25%(2,5 l/ha)
6		San Jose, anthracnose			FunguranI 0,2%(3,0 l/ha)+Novadim 0,13%(2 l/ha)

**Table 2. Main climatic elements of 2011 - 2013 in Iași locality**

	2011					2012					2013				
	Temperature			Precip mm	No. rainy days	Temperature			Precip mm	No. rainy days	Temperature			Precip (mm)	No. rainy days
	mean	low	high			mean	low	high			mean	low	high		
I	-2.2	-16.2	10,4	15.8	15	-2.7	-18.3	11.9	8.9	7	-3.5	-16.3	6.2	60.4	17
II	-2.6	-13.3	17,1	6.0	5	-9.2	-24.3	8.4	18.2	10	0.3	-7.6	7.2	20.4	13
III	3.5	-1.3	8,7	13.2	10	4.1	-11.0	21.7	19.6	8	2.0	-10.8	17.6	37.8	12
IV	10.0	4.8	15,1	81.2	11	12.7	-1.4	30.9	62.0	12	12.0	-1.3	30.8	36.0	10
V	15.8	9.7	22,7	39.0	12	17.3	5.8	31.3	84.2	15	18.3	8.7	30.2	113.4	8
VI	19.6	13.8	26,0	98.4	14	21.2	10.7	37.0	32.0	10	21.3	10.0	32.9	179.6	20
VI I	21.8	9.6	34,1	72.4	9	25.3	12.8	38.5	24.8	10					
VI II	20.4	8.9	30,9	38.8	4	22.3	8.6	41.3	22.4	8					
IX	17.7	5.5	30,4	18.4	6	18.2	7.9	31.4	53.0	9					
X	8.5	-3.3	26,7	39.6	10	11.3	-0.6	27.7	41.4	9					
XI	2.5	-5.5	13,1	1.8	4	5.8	-3.7	19.0	21.6	8					
XI I	2.4	-9.3	14,5	8.0	10	-4.0	-14.0	7.0	59.2	14					
	<b>9.6</b>	<b>-16.2</b>	<b>34,1</b>	<b>435.8</b>	<b>120</b>	<b>10.1</b>	<b>-24.3</b>	<b>41.3</b>	<b>447.3</b>	<b>92</b>	<b>5.8</b>	<b>-16.3</b>	<b>30.8</b>	<b>331.0</b>	<b>60</b>

**Table 3. Efficiency of phytosanitary treatments applied during the period 2011 at RSFG Iași**

Variety	Antrachnose		Moniliosis on fruits		Moniliosis on shoots		<i>Rhagoletis</i>
	F%	I%	F%	I%	F%	I%	
Van	2.6	4.8	2.8	7.0	1.6	4.8	0.7
Stela	3.0	7.6	3.2	7.3	2.2	7.5	1.0
Boambe de Cotnari	3.1	8.0	3.7	8.5	2.5	9.3	1.5
Untreated control	65.6	41.6	35.3	48.7	42.1	48.6	75.2

**Table 4. Efficiency of phytosanitary treatments applied during the period 2011 at RSFG Iași**

Variety	Antrachnose		moniliosis on fruits		moniliosis on shoots		<i>Rhagoletis</i>
	F%	I%	F%	I%	F%	I%	
Van	2.8	5.0	2.5	9.0	1.7	5.0	0.5
Stela	3.0	9.2	2.9	9.5	1.9	8.0	0.8
Boambe de Cotnari	3.5	10.0	3.0	10.0	2.0	10.0	1.2
untreated control	64.8	45.6	38.8	50.0	40.4	50.0	70.1

**Table 5. Efficiency of phytosanitary treatments applied during the period 2011 at RSFG Iași**

Variety	Antrachnose		Moniliosis on fruits		Moniliosis on shoots		<i>Rhagoletis</i>
	F%	I%	F%	I%	F%	I%	
Van	3.1	5.0	2.8	10.0	2.0	5.0	0.0
Stela	3.5	10.0	3.2	10.0	2.5	10.0	0.2
Boambe de Cotnari	4.2	10.0	3.7	10.0	2.7	10.2	0.5
Untreated control	66.3	50.0	40.8	60.0	42.4	50.0	67.3



**Fig. 1. Phenomenon of cherry cracking**



**Fig. 2. Cherry fruits treated against cracking**



**Fig. 3. *Coccomyces hiemalis***



**Fig. 4. *Monilinia fructigena***