RESEARCH REGARDING THE INTRODUCTION INTO CULTIVATION OF CHERRY CULTIVAR RESISTANT TO CHERRY LEAF SPOT (BLUMERIELLA JAAPII)

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Abstract *Cherry leaf spot (Blumeriella jaapii HIGG. syn Coccomyces hiemalis) produces considerable damage in young plantations of fructifying cherry trees. The pathogen attacks the leaves and, under proper conditions, even fruit and shoots. The symptoms characteristic to the attack are the appearance of 1 – 3 cm purple – reddish spots on the upper side of the leaves, spots that often unite covering large areas of the leaves of even the entire leaf. On the other side of the leaves, there are white-pinkish spots containing white-pinkish pustules (acervules). As a result, the leaves start to dry and fall prematurely. Research regarding the introduction and extension of the cultivation of cherry trees of some cultivars resistant to cherry leaf spot was carried aut in the Lugos cheery tree plantation (Far, no. 4) of the Teaching and Experimental Station of the Banat's University fo Agricultural Sciences and Veterinary Medicine „King Michael I" from Timisoara. Te cherry tree cultivars we studied were: Van, Germersdorf, Bing, Rubin, Stella. In each cultivar, starting with the end of May, when there was maximum attack by cherry leaf spot (reddish spotting) we monitored 900 leaves on 3 branches differently set in the fruit tree canopy, noting the frequency, intensity and attack degree in 3 cherry trees from each cultivar monitored. In the cherry tree plantation, we applied, upon warning during vegetation 4 phyto – sanitary treatments using fungicides and insecticides. The observation of the behaviour to the attack by cherry leaf spot (Blumeriella jaapii) allowed us to group the cherry trees into: slightly attacked (Seneca, Cerna, Ulster); medium attacked (Timpurii de mai, Roşii de Bistriţa); strongly attacked (Van, Bing, Germersdorf). We recommend the extension of the cultivation of the cherry tree in south – western Romania.*

Key words: *cherry leaf spot, cherry tree, frequency, attack degree, cultivar*

INTRODUCTION

Among the tree species, a great importance belongs to the cherry tree, due to cherries' high content in minerals, vitamins and other chemical components. The special qualities of the cherries, namely the high content of substances necessary for human consumption, their apparition when there aren't any other fruits only in storehouses, their therapeutic effect, attractive aspect and good taste determine a bigger requirement from consumers, for fresh cherries and also for compotes, preserves and jams. The small yields achieved, compared with the ecologic conditions and the biological potential of these species, have imposed the intensification of researches in order to obtain new varieties, to extend the intensive orchards and to apply the modern methods of maintenance, fertilization and phyto-sanitary protection (ISAC I., 1981, SIMERIA GH., 1995).

The fruit production, in terms of quantity and quality as well, cannot be imagined without the application of adequate technologies, with high-productive varieties and modern methods of prevention and fighting against diseases and pests. Under the conditions from Romania, in neglected cherry tree orchards, more than 45% of fruit or fruit quality may be lost annually, in the case of late ripening varieties (ŞUTA VICTORIA et al., 1976).

Several Romanian or foreign varieties, from natural regions with ecologic similarities with our regions, have suffered along time an adaptation to the specific conditions and may turn to advantage the ecologic conditions in order to reach the expected production levels.

The main diseases that affect the cherry tree in the South-West of the country are: anthracnose (*Blumeriella japii* REHM. v. Arx.), shot-hole disease (*Stigmina carpophilla* LEV. M.B. ELLIS) and brown rot (*Monilinia* laxa ADERH. ET RUHL. HONEY). In the South-West of the country, the anthracnose presents an attack degree of 7.9%.

By ellaborating new integrated control complexes according to the biology and ecology of the cherry tree's diseases and pests, we may participate with a significant contribution to the achievement of highly qualitative and quantitative yields, at smaller prices and with a reduced pollution. One of the prevention methods for the losses caused by anthracnose is represented by the utilization of varieties that are resistant and tolerant to this pathogen's attack. That is why it is very important to study the behavior of different varieties and hybrids to the attack caused by anthracnose fungus, *Coccomyces hiemalis* HIGG sin. *Blumeriella jaapi* REHM. v. Arx.

The researches were performed at the Orchard Centre Lugoj – Farm no. 4 – Experimental Didactic Base of the Banat's University of Agricultural Sciences and Veterinary Medicine "King Michael I" from Timisoara, in the cherry tree plantation.

MATERIALS AND METHOD

Our researches were carried out on the behaviour of some cherry tree varieties under the attack caused by the fungus *Coccomyces hiemalis*, in the comparative plantations from the Orchard centre Lugoj – intensive cherry tree plantations (5 x 4) in linear arrangement.

We performed observations and determinations on the frequency, intensity and attack degree of the main diseases that affect cherry tree cultivation in the West of the country. The experience includes a number of 8 variants and each variant has 3 repetitions with 5 trees. In order to determine the attack caused by *Blumeriella jaapi* HIGG, we kept under observations three trees (each tree represented one repetition), during the period of maximal attack – 300 leaves (from 3 branches, differently located in treetop), 50 shoots and 100 pieces of fruit from each tree.

According to the frequency and intensity of *Coccomyces hiemalis* HIGG's attack, the varieties were classified into 5 groups, as follows:

- very slightly attacked (FSA, where F = 0.1 – 3%, 1 = 3%)
- slightly attacked (SA, where F = 3.1 – 11%, 110%)
- medium attacked (MA, where F = 11.1 – 25%, 1 = 25%)
- strongly attacked (PA, where F = 25.1 – 50%, 1 = 50%)
- very strongly attacked (FPA, where F = 50.1 – 100%, 1 > 50%).

RESULTS AND DISCUSSIONS

The behaviour of some cherry tree varieties under the attack caused by the fungus blumeriella jaapi higg. Which causes cherry tree anthracnose

The behaviour of cherry tree varieties and hybrids to the attack caused by *Blumeriella jaapi* Higg. in Farm no. 4 Lugoj, belonging to the Banat's University of Agricultural Sciences and Veterinary Medicine "King Michael I" from Timisoara , is presented in tables 1. and 2.

Table 1.

Anthracnose attack degree in cherry tree varieties, in 2013, in Farm no. 4 Lugoj - Banat's University of Agricultural Sciences and Veterinary Medicine "King Michael I" from Timisoara

No.	Variety	Attack degree %				
		Repetition			S Total	Mean
		I	II	III		
1.	Timpurii de mai	4,8	4,2	4,45	13,45	4,5
2.	Roşii de Bistriţa	2,9	2,45	2,65	8,0	2,7
3.	Seneca	1,15	0,65	0,75	2,55	0,85
4.	Cerna	0,93	0,53	0,81	2,27	0,75
5.	Ulster	0,7	0,8	1,2	2,7	0,9
6.	Van	13,7	14,1	13,5	41,3	13,75
7.	Bing	12,15	12,85	12,64	37,64	12,55
8.	Germersdorf Control variant	12,35	12,6	12,7	37,5	12,55

Table 2.

Results of observations on the cherry tree behaviour under athracnose attack (*Blumeriella jaapi* Higg.) in cherry tree varieties, in 2013, in Farm no. 4 Lugoj - Banat's University of Agricultural Sciences and Veterinary Medicine "King Michael I" from Timisoara

No.	Variety	Frequency F%	Intensity I%	Attack degree Ga%	Difference compared to control	Significance	Classification
1.	Timpurii de mai	18	25	4,5	-8,05	000	MA
2.	Roşii de Bistriţa	11	25	2,7	-9,85	000	MA
3.	Seneca	8,5	10	0,85	-11,7	000	SA
4.	Cerna	7,5	10	0,75	-11,8	000	SA
5.	Ulster	9	10	0,9	-11,65	000	SA
6.	Van	27,5	50	13,75	1,2	-	PA
7.	Bing	25,1	50	12,55	0	-	PA
8.	Germersdorf	25,1	50	12,55	-	-	PA

DL 5% = 1,92
DL 1% = 2,52
DL 0,1% = 3,37

– very strongly attacked – FPA

According to the data presented in table 4.2., under the attack caused by *Blumeriella jaapi* Higg., in the South-West of the country, the cherry tree varieties may be classified as follows: slightly attacked (SA: Seneca, Cerna, Ulster); medium attacked (MA: Timpurii de mai, Roşii de Bistriţa); strongly attacked (PA: Van, Bing, Germersdorf).

Warning and treatment application according to varieties' resistance to the attack caused by the fungus blumeriella jaapi higg. That produces cherry tree anthracnose, in the orchards from lugoj region, in 2013

According to the data presented in table 4.3., only 4 out of 8 phyto-sanitary warned treatments were applied in the slightly attacked varieties (Seneca, Cerna and Ulster), representing a reduction of treatments and environmental pollution of 50%.

In the case of the varieties Timpurii de mai and Roşii de Bistriţa, medium attacked by anthracnose, we applied 6 treatments, and the reduction process represented 25%.

In the varieties Van, Bing and Germersdorf, strongly attacked by anthracnose, we applied all the 8 warned treatments.

Although the varieties Van and Germersdorf are strongly attacked by cherry tree anthracnose, which produces early tree defoliation with all the usual consequences, these varieties are still recommended for cultivation due to fruit quality and resistance to cracking during the rainy years (like the year 2012).

Table 3.

Warning and phyto-sanitary treatment application in cherry tree, in the orchards from Lugoj region, in 2013, in Farm no. 4 Lugoj - Banat's University of Agricultural Sciences and Veterinary Medicine "King Michael I" from Timisoara

No.	Variety	Resistance group	No. of warned treatments	No. of applied treatments	%	
					Applications	Reductions
1.	Timpurii de mai	MA	8	6	75	25
2.	Roşii de Bistriţa	MA	8	6	75	25
3.	Seneca	SA	8	4	50	50
4.	Cerna	SA	8	4	50	50
5.	Ulster	SA	8	4	50	50
6.	Van	PA	8	8	100	-
7.	Bing	PA	8	8	100	-
8.	Germersdorf Control variant	PA	8	8	100	-

Treatment rationing.

In the case of the variety Germersdorf, according to table 4.4., the complexes applied in the experimental variants have reduced the anthracnose attack to 0.3 – 8.8%, compared to 69.4 – 74.0% in the untreated control variant.

Table 4.

Treatment rationing in cherry tree varieties in 2013, in Farm no. 4 Lugoj - Banat's University of Agricultural Sciences and Veterinary Medicine "King Michael I" from Timisoara

No.	Variety	No. of warned treatments	No. of applied treatments	Production
1.	Timpurii de mai	8	6	5,5
2.	Roşii de Bistriţa	8	6	5,3
3.	Seneca	8	4	4,7
4.	Cerna	8	4	5,0
5.	Ulster	8	4	4,2
6.	Van	8	8	4,3
7.	Bing	8	8	4,1
8.	Germersdorf	8	8	4,7
9.	Untreated control variant	-	-	3,7

Although the mean cherry tree yields in this period were negatively influenced by some unfavourable spring weather conditions, we still may observe obvious differences between the treated variants, with yields of 5.5 – 4.1 tons/ha, and 3.7 tons/ha, in the untreated control variant.

CONCLUSIONS:

1. Cherry tree anthracnose, caused by the pathogen *Blumeriella jaapi* REHM. VON ARX sin. *Coccomyces hiemalis* HIGG., is the main disease that produces significant losses in cherry tree plantations; this generates the emmission of warnings for the application of phyto-sanitary treatments during the vegetation period.

2. Under the pedo-climatic conditions from 2013, in the orchards from Lugoj region, the behaviour of cherry tree varieties under the attack caused by anthracnose was:

– slightly attacked varieties: Cerna, Seneca, Ulster;
– medium attacked varieties: Timpurii de mai, Roşii de Bistriţa;
– strongly attacked varieties: Van, Bing, Germersdorf.

4. By introducing in plantation the cherry tree varieties that are slightly attacked by anthracnose, we reduced the phyto-sanitary treatments and environmental pollution with 50%. In the medium attacked varieties, this reduction was 25%.

5. In order to reduce environmental pollution successive to chemical fight against diseases, we recommend the introduction in plantations of cherry tree varieties that are slightly or medium attacked by anthracnose, the main disease that causes losses in cherry tree.

6. Although the varieties Germersdorf and Van were strongly attacked by anthracnose, in 2013, they are still recommended for cultivation due to their productivity, fruit quality and resistance to cracking in rainy years.

7. The best production results were achieved in the varieties: Timpurii de mai, Roşii de Bistriţa and Cerna.

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