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**RESEARCH ON THE ATTACK OF THE *MONILINIA FRUCTIGENA*  
PATHOGEN (ADERH. & RUHL) HONEY ON THE APPLE, HARTIESTI  
LOCATION, ARGES COUNTY**

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**ABSTRACT**

*The researches were carried out within the experiments regarding the attack of *Monilinia fructigena* on apple in the location of Hârtiești, Argeș County, in the conditions of 2017. The biological material was represented by the varieties: Florina, Generos, Goldrush, Idared and Topaz. The observations were made in the untreated version and concerned the incidence of the attack on fruit and sprouts of the monitored varieties. The obtained results regarding the attack of the pathogen *Monilinia fructigena* in the conditions of 2017 show that the highest value of fruit attack incidence was found in the Idared variety where  $F = 35\%$  followed by Topaz variety with a value of attack frequency of 29%. Regarding the attack on sprouts, it was found that the same varieties had the highest values of incidence, 10% and 9%, respectively. Among the analysed varieties, Florina variety registered the lowest values of the attack on both fruit and sprouts.*

**INTRODUCTION**

Apple moniliosis caused by the pathogen *Monilinia fructigena* is manifested every year in apple orchards. The produced symptoms are visible in the attacked organelles, sprouts and fruit. The sprouts wither, turn brown and dry and the attack on fruit involves the appearance of brown rot, black rot and fruit mummification (Agrios, 2005; Gheorghies and Cristea, 2001; Chitulescu and Cristea, 2017). The pathogen responsible for the appearance of specific symptoms, makes the pathogen to cause significant fruit loss in both orchards and storage conditions (Van Leeuwen GCMet all., 2000; Berrie AM, 1989). Research has shown that abiotic (climatic conditions) and biotic (insects) play an important role in the spread of the pathogen and can ensure subsequent infections (Holb I., 2003; Holb and Scherm, 2008; Chitulescu and Cristea, 2019). The research area, Hartiesti location, Arges County, known for apple culture in Romania, is facing the attack of moniliosis (Chitulescu et Cristea, 2017). Knowledge of the biology and intervention to control the attack of moniliosis on apple has a particular importance for apple growers (Byrde et Willetts, 1977). The application of a treatment scheme that ensures an integrated control of diseases and pests specific to apple, that includes protection against the attack of moniliosis and that observes the recommendations for the products used ensures effectiveness in their control. The effectiveness of treatments in controlling diseases

in continuous culture plants is a concern of agronomic research, in accordance with the new tested and approved molecules (Alexandru et al, 2019; Batra 1991).

### MATERIAL AND METHOD

The experiments monitored the attack of *Monilinia fructigena* on the apple and the effectiveness of a treatment scheme in combating this pathogen. The researches took place in an apple orchard from Hartiesti location, Arges County, in the conditions of 2017. The biological material was represented by the apple varieties Florina, Generos, Idared, Goldrush, Topaz cultivated in the research area. The observations took into account the determination of the incidence of the attack on sprouts and fruit. The intensity of the attack was considered maximum, knowing that the attacked organelles are completely destroyed by the pathogen attack. The frequency of the attack was calculated according to the formula:  $F (\%) = n \times 100 / N$ , where F = frequency of the attack, n = percentage of organs with specific attack, N = total number of analysed organs. The intensity of the attack is considered to be 100% due to the degree of the attack equivalent to its frequency. The efficacy of the treatment is calculated according to the formula  $E (\%) = (Fm - Fv) / Fm$ , where: E = efficacy (%), Fm = attack frequency for the untreated variant (%), Fv = attack frequency for the treated variant (%). The data regarding the climatic conditions of the year were taken from the Meteorological Station - from the Institute for Fruit Growing in Pitesti - Mărăcineni. Statistical analysis of experimental data was performed with the ANOVA program.

### RESULTS AND DISCUSSIONS

#### 1. Meteorological data

In 2017, the average annual air temperature registered a high value of 11.0°C, exceeding the multiannual values by 1.1°C. The amount of precipitation (632.3 mm) decreased by 45 mm compared to the multiannual average (677.3 mm) (Figure 1).

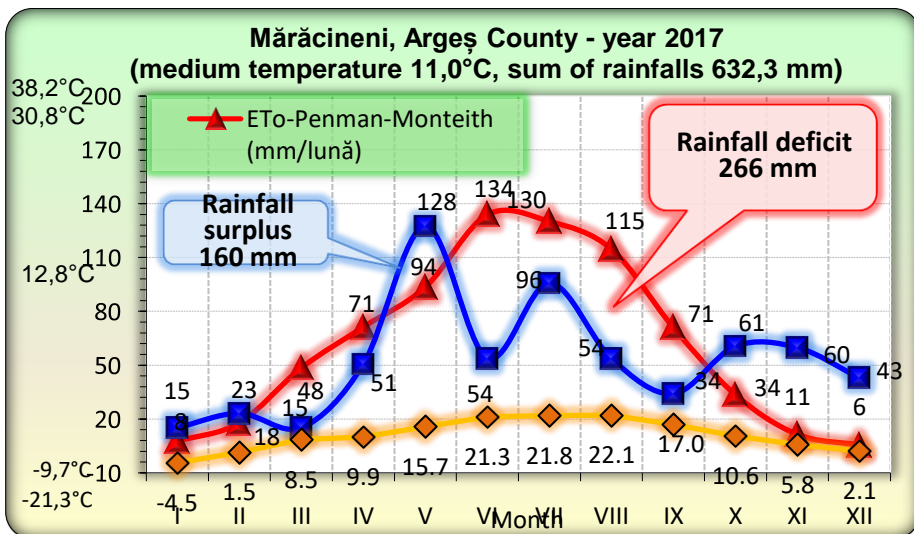


Figure 1. Climatic conditions of 2017 in Mărăcineni, Argeș County

Comparing the water regime of 2017 with the multiannual values, we find that there were deviations, both in terms of surplus and, especially, rainfall deficit.

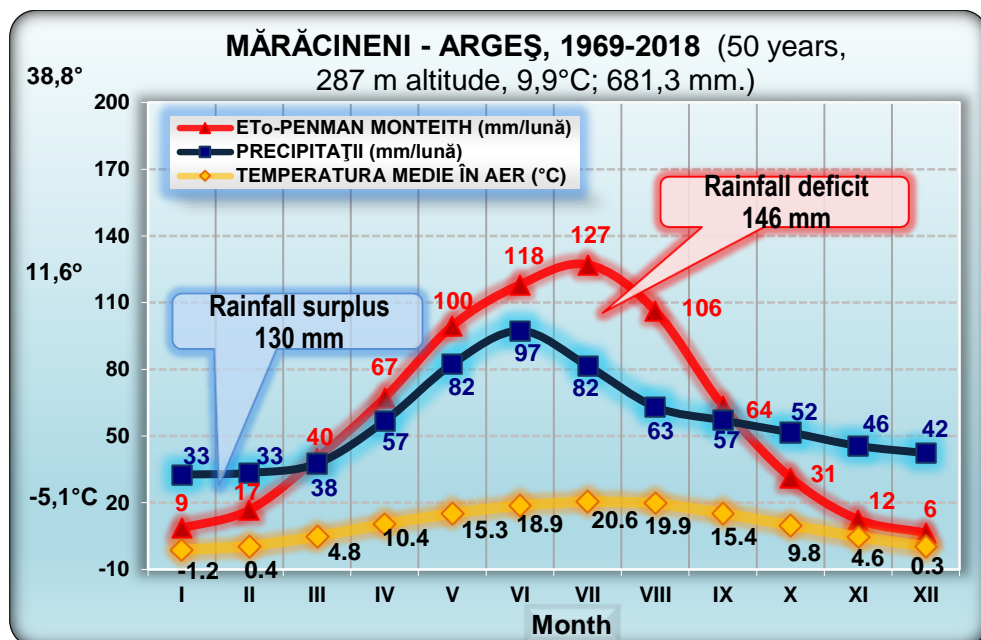


Figure 2. Multiannual meteogram in Mărcăineni, Argeș County

Thus, the large rainfall surplus of 160 mm exceeded by 40 mm the multiannual value, especially in May, and the deficit of 266 mm exceeded by 116 mm the normal value, being recorded in July and August (Figure 2).

## 2. Results of *Monilinia fructigena* attack on fruit

The data regarding the attack of the pathogen *Monilinia fructigena* on the fruit in 2017 are presented in Table 1. Under the conditions of 2017, for the control variety, Idared, the value of the frequency of the fruit attack was 35%. For the Topaz variety, the value of the fruit attack frequency was 29% and for the Generos variety, F = 24%. For the Goldrush variety, the attack frequency values of 28% were calculated. Regarding Florina, in 2017 it was found that the value of the attack frequency on fruit was 20%, the lowest value in the conditions of this year, compared to the studied varieties.

Table 1.  
Frequency of the attack of the *Monilinia fructigena* pathogen on fruits, year 2017, Hârtiești location, Argeș County

Variety	2017	Difference	Significance
	F(%)	2017	2017
Generos	24	-11	000
Topaz	29	-6	000

Goldrush	28	-7	000
Florina	20	-15	000
Idared (control)	35	0	-
DL	5%	1,885	
	1%	2,680	
	0,1%	3,880	

The analysis of the results in Table 1 showed that the differences in the researched varieties were statistically assured, being interpreted very significantly in a negative way. This confirms that the values of the attack frequency on the fruit were lower than those of the Idared variety, the behaviour of the varieties at the micromycete attack being superior to the control.

### 3. Results of the *Monilinia fructigena* attack on sprouts

The results of the observations regarding the attack of the pathogen *Monilinia fructigena* were presented in Table 2. Regarding the frequency of the attack on sprouts, it was found that in the varieties Generos, F = 5%, Topaz with F = 9% and Goldrush with F = 8%. For Florina variety, the value of the moniliosis attack frequency on sprouts in 2017 was 4% and for the Idared variety, the value was F = 10%.

Table 2.

Frequency of *Monilinia fructigena* fungus attack on shoots, year 2017,  
Hârțiești location, Argeș County

Variety	2017	Difference	Significance
	F(%)	2017	2017
Generos	5	-5	000
Topaz	9	-1	ns
Goldrush	8	-2	0
Florina	4	-6	000
Idared (control)	10	0	-
DL	5%	1,227	
	1%	1,744	
	0,1%	2,525	

Statistical analysis of the data shows that compared to the control variety, the differences were interpreted very negatively for Generos and Florina varieties and significantly negative for the Goldrush variety. As a result, there was a reduction in the attack on the sprouts compared to the control. In the case of the Topaz variety, the differences were insignificant, the value of the incidence of moniliosis attack on sprouts being close to that of the Idared variety (Table 2).

## CONCLUSIONS

The results obtained regarding the attack of *Monilinia fructigena* pathogen in the conditions of 2017 show that the highest value of the incidence of fruit attack was found in Idared variety (F = 35%) in the untreated variant followed by Topaz variety with an attack frequency value of 29% . Regarding the attack on sprouts, in the conditions of the experimental year 2017, it was found that the same varieties presented the highest values of incidence.

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