

CONSIDERATIONS REGARDING THE USE OF ANTI-HAIL NETS FOR THE PROTECTION OF TABLE GRAPE PLANTATIONS IN HINOVA VITICULTURAL AREA, MEHEDINTI COUNTY

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Abstract

This paper aims to present the benefits of implementing a protection system with nets against hail in table grape vineyards, as well as the problems that may occur. The study was carried out between 2013 and 2017, in a table grape vineyard in Hinova, Mehedinti County. It was possible to analyze during the 5 years of study the behavior of vegetative phenophases of the 'Victoria' vineyard grown in a system covered with the anti-hail net, compared to another 'Victoria' vineyard cultivated in an uncovered system. In the studied period, hailstones occurred in 2014, 2016 and 2017, the most severe hail fall occurring on June 20, 2014, where the damage to the unprotected 'Victoria' vineyard was 100%. In conclusion, the protection of the vineyards with anti-hail net is beneficial, it protects to a certain extent against late spring frost, but it also draws certain shortcomings or reservations in deciding to choose for a such protection: high-cost investment, more frequent application of treatments to fight diseases and pests.

Keywords: anti-hail net, Hinova area, Mehedinti County, vine protection.

INTRODUCTION

Hailstorms, according to their intensity, can have destructive effects on vine plantations, causing significant damage, compromising the grape production in that year, plant tissue damage, thus creating doorways for the diseases of the vine and negatively influencing the resistance to winter frosts (Bernaz, 2003). Faced with these unpredictable natural phenomena, grape growers in general and table grape growers in particular can take a series of measures, one of which is the installation of nets to protect against hail. Taking this into account, the present work presents the benefits that such protection can offer, as well as the problems that can cause in a table grape vineyard.

MATERIALS AND METHODS

In order to highlight the advantages and disadvantages offered to vineyards by anti-hail net systems, two plots cultivated with 'Victoria' table grapes variety were studied, one having a net protection system against the hail installed, the other not having this system installed.



Figure 1. 'Victoria' vineyard protected by anti-hail net



Figure 2. Unprotected 'Victoria' vineyard

The analysis period in this study was 2013-2017.

RESULTS AND DISCUSSIONS

The hail protection system was installed in the summer of 2013. During the year 2013 no hailstones occurred.

The two plots behaved relatively similarly until ripeness (BBCH 81-85), when in the plot covered with the net against the hail there were noticed botrytis infested grapes, especially in the middle part of the plot, while on the uncovered vineyard the grapes were perfectly healthy. The net against hail was removed at the end of October.

In 2013, both plots were treated with identical phytosanitary treatments.

In 2014, the anti-hail net was installed in early April. Both plots were treated with identical phytosanitary treatments until the beginning of blooming. During the beginning of the blooming (BBCH 55-57), in the plot covered with the net there were reported inflorescences attacked by mildew, although the number of treatments and the interval between them was strictly respected, using only phytosanitary products with systemic action. Measures have been taken and additional treatments were administrated to keep the attack under control. There was no mildew attack reported in the uncovered plot.



Figure 3. 'Victoria' inflorescence attacked by mildew

On June 20, during a strong storm accompanied by massive hailstones, grape production in the uncovered 'Victoria' vineyard was totally

compromised, destroying both grape bunches, leaves and vine shoots, who suffered deep tissue lesions.



Figure 4. Damage caused by heavy hail fall

In the protected vineyard, with the exception of the marginal rows, there were no problems caused by hail, thus protecting both the grape production and the health of the vines.



Figure 5. Hail stones on top of the anti-hail net system



Figure 6. Average-size hailstones reported after hail fall in 2014

In 2015, on the vine shoots from the 'Victoria' vineyard covered with anti-hail net traces of excoriosis attack was reported, vine wood disease never met before in the plantation. The uncovered plot did not show signs of this disease.

During the year, high-pressure infection of mildew, oidium and botrytis was reported in the anti-hail protected vineyard. In order to maintain the state of health of the vineyards, the interval between phytosanitary treatments was shortened, and at the same time in the disease control program there were introduced phytosanitary products with contact action for additional protection in critical moments (copper oxychloride against mildew and soluble sulfur against oidium). This increased the number of phytosanitary treatments applied to the vine throughout the wine year.

Hailstones did not occur in 2015.

The year 2016 was similar to 2015, on the plot covered with anti-hail net, the total number of treatments applied against diseases and pests increased to 10, compared to 7 treatments applied on the plot not covered with anti-hail net.

Two hailstorms occurred at the beginning of May and early July, of low intensity, resulting in minor damage to the unprotected plot. August was rainy, with cumulative rainfall reaching 70 L/sqm. These climatic conditions, which intersected with the time when the grapes reached maturity, gave rise to a strong botrytis attack, with considerable losses of production being reported in the covered plot with 60% compared to 20% - losses in the uncovered plot.

In the spring of 2017, on April 22, while the vine shoot was in the 2-3 leaf stage (BBCH10-12), the min-max thermometer recorded a minimum of 0°C during the night, resulting in producing a late spring frost. As a result of this climatic accident, the vine shoots of the uncovered plot were affected in a proportion of 75-80%.

On the plot covered with the anti-hail net there was no significant damage, the production of grapes being a normal one, characteristic of the variety. The shoots on the plot uncovered against hail have been partially recovered, starting from the buds situated at the wrist of the leaves, but they were weak, had no fruit, so

the production of grapes has been low and of poor quality.



Figure 7. Temperatures of 0°C recorded by min-max thermometer on April 22, 2017



Figure 8. 'Victoria' young shoots affected by late-spring frost cultivated in unprotected vineyard



Figure 9. 'Victoria' young shoots unaffected by late-spring frost cultivated in net-protected vineyard

The number of phytosanitary treatments applied to the protected plot was 10, and in the unprotected plot 6.



Figure 10. Phytosanitary treatment applied in 'Victoria' vineyard protected by anti-hail nets

During the year 2017, several hailstorms of small and medium intensity occurred, affecting to some extent the quality of the poor grape production in the plot unprotected with anti-hail nets.

CONCLUSIONS

Protecting the vineyards with the anti-hail net is an ideal solution for table grape growers who want to obtain a high quality grape production, thus providing a system that can protect both grape production and vegetation year by year by the devastating effects of hailstones, good results also being obtained in the protection of

the late spring frosts, when the temperatures are not well below the freezing threshold.

Among the less pleasant aspects of this study can be summarized: large initial investment, reduced ventilation at the level of the hub in the area covered with anti-hail net, high moisture content, as well as persistent dew for a longer time, compared to the plot uncovered with anti-hail net, which results in the need for a higher number of phytosanitary treatments.

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