

THE INFLUENCE OF THE PROBABLE CLIMATE CHANGE ON THE VEGETATION PHENOPHASES ON THE MERLOT VARIETY IN THE DEALU BUJORULUI VINEYARD

INFLUENȚA SCHIMBARILOR CLIMATICE PROBABILE ASUPRA FENOFAZELOR DE VEGETAȚIE LA SOIUL MERLOT ÎN PODGORIA DEALU BUJORULUI

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Abstract. *The development of vegetation and fructification phenophases in vine is determined by the cumulative action of daily average temperatures exceeding the value of 10°C, a value that is considered a biological threshold for vine. In the climatic conditions of the last few years a random evolution of the amount of active and useful temperature levels necessary to trigger the phenological stages was observed. The research was carried out during 2008-2017 on the Merlot variety in the experimental field of the Research and Development Station for Viticultural and Winemaking Bujoru. The main objective of the paper is to establish the active and useful thermal balance necessary for the development of the vegetation phenophases and the determination of the trend of their evolution. There is a slight tendency to increase the active temperature for budburst and ripening phenophases and a decreasing pronounced trend for the flowering and harvesting phenophases.*

Key words: vine, vegetation phenophases, active thermal balance, useful thermal balance

Rezumat. *Desfășurarea fenofazelor de vegetație și fructificare la vița de vie este determinată de acțiunea cumulativă a temperaturilor medii zilnice ce depășesc valoarea de 10°C, valoare ce este considerată prag biologic la vița de vie. În condițiile climatice ale ultimilor ani s-a putut observa o evoluție aleatoare a sumei gradelor de temperatură activă și utilă necesare declanșării stadiilor fenologice. Cercetările au fost efectuate în perioada 2008-2017 la soiul Merlot în câmpul experimental din cadrul Stațiunii de Cercetare Dezvoltare pentru Viticultură și Vinificație Bujoru. Lucrarea are ca obiectiv principal stabilirea bilanțului termic activ și util necesar desfășurării fenofazelor de vegetație și stabilirea tendinței evoluției acestora. Se observă o tendință ușoară de creștere a temperaturilor active pentru fenofaza de dez mugurit și părgă și o tendință pronunțată de descreștere pentru fenofazele de înflorit și maturare.*

Cuvinte cheie: viță de vie, fenofaze de vegetație, bilanț termic activ, bilanț termic util

INTRODUCTION

Climate change is that climate change that is directly or indirectly attributable to human activity, which alters the composition of the atmosphere at global level, and which adds to the natural climate variability observed during

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comparable periods. Climate change is determined by both internal and external natural or external anthropogenic factors resulting from human activities (Planul national de actiune 2016-2020). The Climatic factors influence or determine certain processes, acting directly or indirectly on vineyard culture. In the vineyard culture, first of all, interested the climatic factors of the period from April 1 to September 30, interval which overlap with the length of the vegetation period, are of interest. Global climate change is one of the major concerns of our century - a complex area where it is necessary to improve knowledge and understanding to take immediate and accurate action to tackle the cost-effective approach and challenges in this area, while respecting the precautionary principle.

MATERIAL AND METHOD

The research was carried out in the experimental field of the Research and Development Station for Viticultural and Winemaking Bujoru in 2008-2017. The phenological observations were made on the Merlot variety. Data on the thermal active balance, the useful heat balance and the evolution of vegetation phenophases were analyzed and processed. The climatic data were recorded at the agrometeorological station of the resort using an AGROEXPERT system.

RESULTS AND DISCUSSIONS

Weather observations and determinations was effectuated over the period 2008-2017 and compared to multiannual environments in view of the proposed objective. Air temperature is an abiotic factor that exerts a strong influence on the intensity of the physiological and biochemical processes of the vine. The influence of temperature on these processes is achieved by both its level and the sum of grades in a determined period (Alexandrescu *et al.*, 1994). Active temperature plays a decisive role in triggering vegetative phenophases. The minimum active temperature level that conditions the occurrence of phenophases in vines is called the lower threshold and the maximum level is called the higher threshold. The active and useful heat balance was calculated during the period 2008-2017, on each vegetation phenophase. In the climatic conditions of the last 10 years we can observe a random evolution of the sum of active and useful temperature required to trigger the phenological stages for the Merlot variety. The trend of the evolution of the amount of active and useful temperature grades is increasing from 2008 to 2017 for the budburst and ripening phenophases and a decreasing trend for the flowering and harvesting phases (fig.1, fig. 2). Significant deviations of active and useful temperatures for maturation were recorded in 2011 and 2014 as a result of high rainfall in August, a drastic rainfall shortage in September and the presence of high temperatures. Dynamically analyzing the evolution of the amount of active and useful temperature ranges, a change in their values required to trigger the vegetation phenophases was observed.

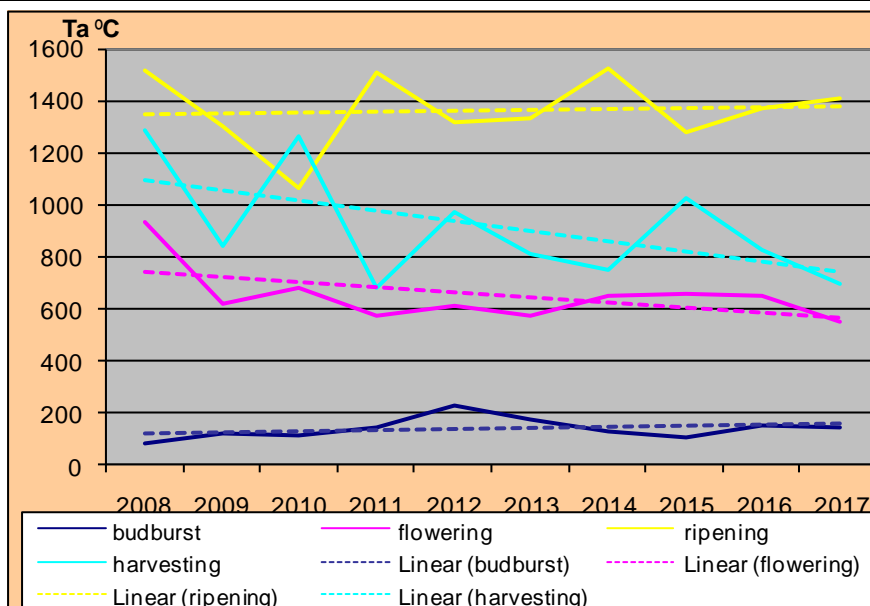


Fig. 1 Active thermal balance in the vegetation period 2008-2017

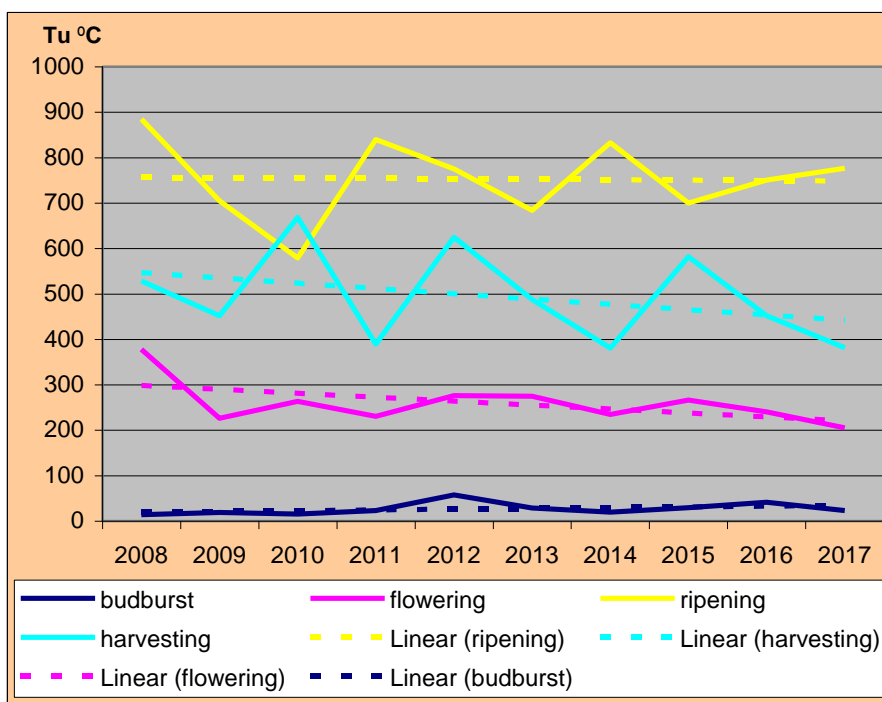


Fig. 2 Useful thermal balance in the vegetation period 2008-2017

The triggering of vegetation phenophases is directly influenced by climatic conditions (Enache, 2007). In 2008-2017 period, in general, budburst takes place in the last decade of April with the exception of 2008, 2009 and 2016, and maturity in the first and second decades of September, with the exception of 2012 when air temperatures were recorded very high in August and grape ripening took place at the end of August (tab.1). Flowering begins at the end of May, the early June (excluding 2013 year). Vegetation phenophases during the analyzed period are conditioned by a series of biological, technological and ecological factors and the response of the vine to changes in climatic factors is that the biological rhythm of growth, fructification and maturation is more alert, requiring the rethinking of vine cultivation technologies.

Table 1

**Dynamics of vegetation phenophases for Merlot variety,
at SCDVV Bujoru during 2008-2017**

phenophase /the year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
budburst	09.04	15.04	20.04	29.04	25.04	24.04	21.04	21.04	12.04	24.04
flowering	05.06	30.05	05.06	04.06	30.05	24.05	04.06	04.06	31.05	01.06
ripening	07.08	27.07	24.07	10.08	24.07	28.07	12.08	31.07	01.08	05.08
harvesting	17.09	03.09	22.09	12.09	28.08	09.09	17.09	14.09	08.09	07.09

CONCLUSIONS

1. In the climatic conditions of the past 10 years, the trend of the evolution amount of active and useful temperature required to trigger the phenophases of vegetation for the Merlot variety is increasing from 2008 to 2017 for the budburst and ripening of the grapes and in decline for the flowering and maturation phases.

2. Budburst takes place in the last decade of April except for the years 2008, 2009 and 2016 and for the grapes to mature in the first and second decades of September, with the exception of 2012 when very high air temperatures were recorded in August and maturing took place at the end of August.

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