



"MULTIDISCIPLINARY CONFERENCE  
ON SUSTAINABLE DEVELOPMENT"

Section

"Research, innovation and technology transfer in the Horticulture, Forestry  
and Biotechnologies fields"

30 - 31 May 2024

## The response of controlled irrigation on the yield and plant parameters of table grapes from central Romania

Andrei Tănase<sup>1,2</sup>, Dorin Sumedrea<sup>1\*</sup>, Alina Florea<sup>1</sup>, Daniel Dinu<sup>1</sup>, Anca Onache<sup>1</sup>,  
Adrian Asănică<sup>2</sup>

<sup>1</sup>National Research and Development Institute for Biotechnology in Horticulture  
Ștefănești - Argeș, București-Pitești Street, No. 37, Romania,

<sup>2</sup>University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Marasti  
Blvd, District 1, Bucharest, Romania [asanica@gmail.com](mailto:asanica@gmail.com)

**Abstract:** *The objectives of this study were to investigate Vitis vinifera L. Grapevine 'Augusta', 'Argessis', and 'Victoria' cvs. responses to the irrigation treatments applied to a young crop, in the climatic conditions of central Romania: full irrigation (100% Etc), non-irrigated treatment (NI) and deficient irrigation (DI) replacing only 50% of the estimated evapotranspiration.*

### • Introduction

Many table or wine grape varieties are researched for years in ampelographic collections or in field competitions to study how these varieties adapt to variation. meteorological conditions. Although drip irrigation consistently increased the yield of the variety in our study, there are few studies on controlled irrigation management in vineyards cultivated with vines in the central area of Romania regarding vine performance in table grape varieties.

### • Material and method

A young vine plantation cultivated with three local genotypes ('Augusta', 'Argessis', and 'Victoria') for table grapes located at the National Research and Development Center for Biotechnology in Horticulture Ștefănești. During the period 2021-2022, the irrigation treatments explored for the three varieties in the experimental block were as follows: no irrigation treatment (NI), controlled deficit irrigation (DI), calculated as 50% of the estimated crop evapotranspiration (ETc), and, full irrigation (FI), applying 100% ETc calculated.

The different irrigation regimes were applied by changing the irrigation doses applied in each irrigation event, but maintaining the same irrigation frequency, which varied from 1 to 2 times a week in spring until 5-6 times a week in the middle of summer.

### • Results and discussions

- ✓ Although in the first season both the shoot weight, pruning weigh, and shoot dry weight was lower than in 2022, this did not lead to significant differences between the years of the study.
- Significant differences were evident between the year and the irrigation treatment of all the vigour parameters of the analysed plants, regardless of the variety. Berry weight was significantly influenced by treatments with lower water availability (DI) and FI, in all studied varieties.
- The increase in production increased in the case of full irrigation as well as in deficit irrigation by 0.4 kg in 2021, respectively by 0.6 kg in 2022, for the 'Argessis' cultivar compared to the production recorded at NI.

### Conclusions

- Deficit irrigation controlled with the supply of 50% of Etc recorded productions very close to those recorded in the case of full irrigation in all analysed varieties, the differences being significant.
- The vineyard with the three varieties of table grapes studied under different levels of irrigation presented a slight water stress under rainfed treatment (NI), suggesting that water supplied by precipitation was not sufficient for the proper functioning of the plant.