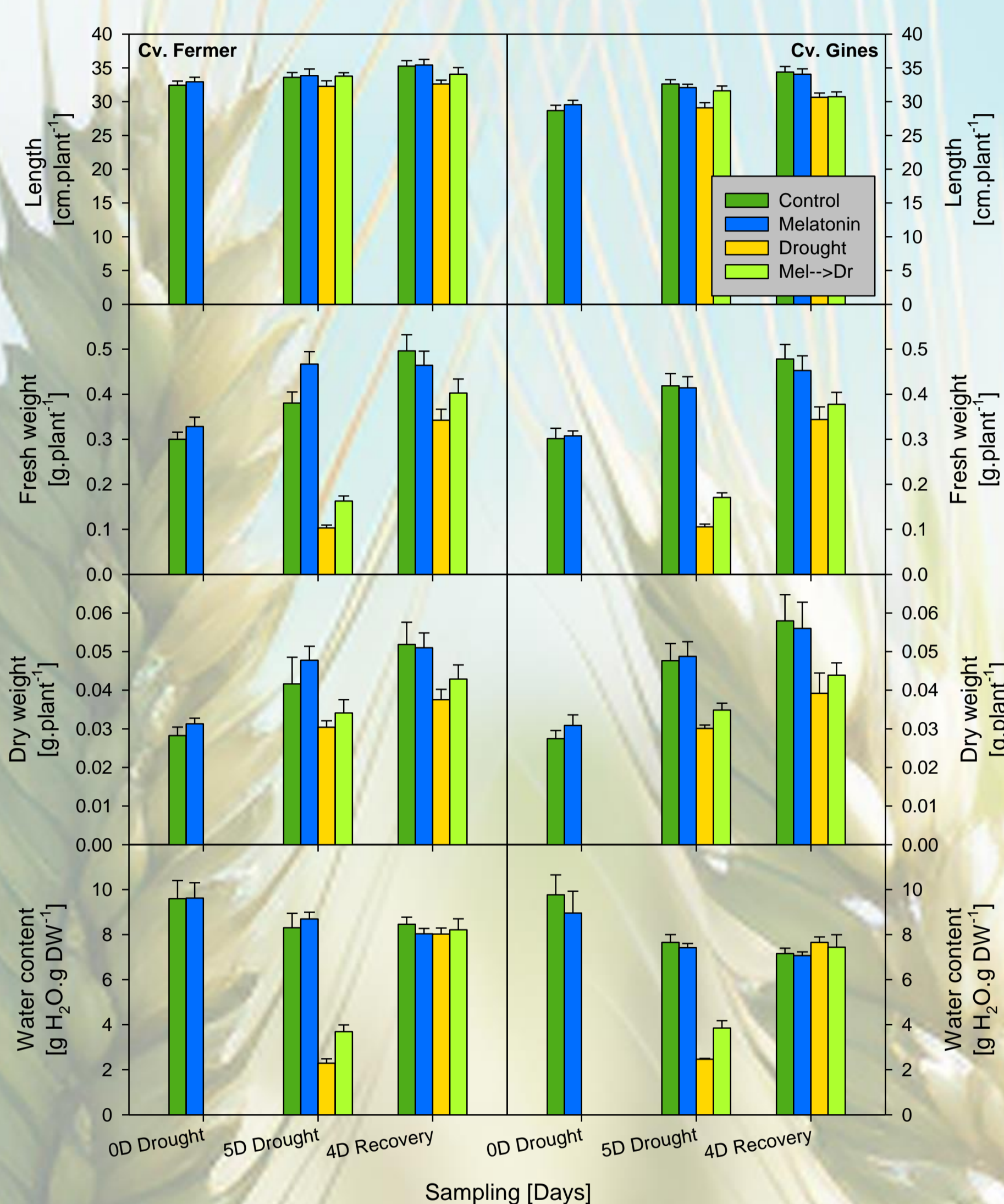


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Wheat is staple crop for human population, and even though it tolerates water deficit to a certain level, extended drought provokes a number of unfavorable alterations in plants, which lead to a significant decrease in its productivity. The exploration of ecological biostimulants is an innovative approach to diminish the negative effects of drought, which gain scientific attraction during the last decades. Melatonin is a natural product of plant metabolism with growth-regulating properties - it is non-toxic and is environmental friendly. The aim of the study is to assess the capability of exogenous melatonin to mitigate the negative effects of water deficiency in two Bulgarian wheat cultivars subjected to drought.



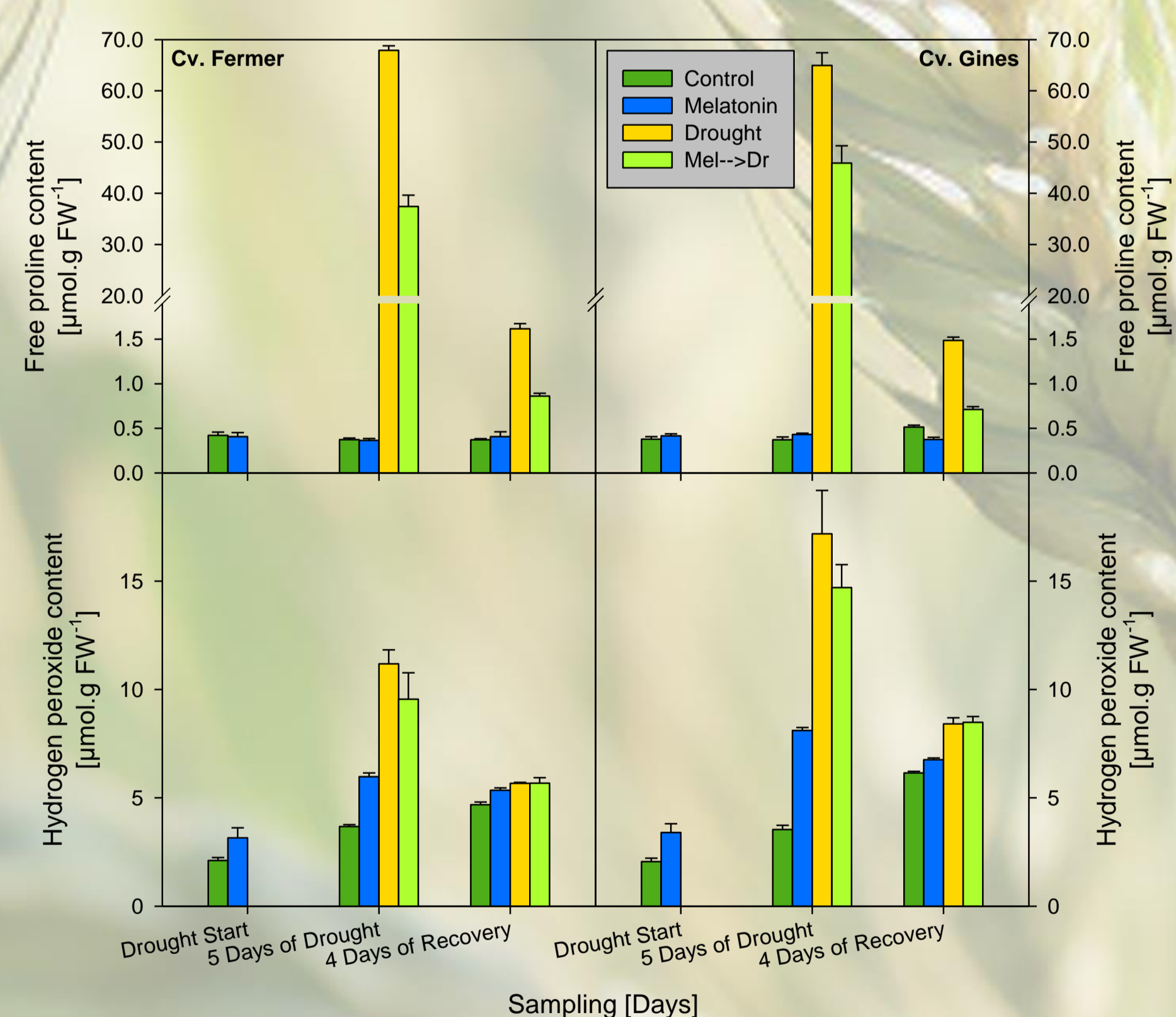
Biometric parameters of wheat plants treated with melatonin and subjected to drought stress.

Methodology

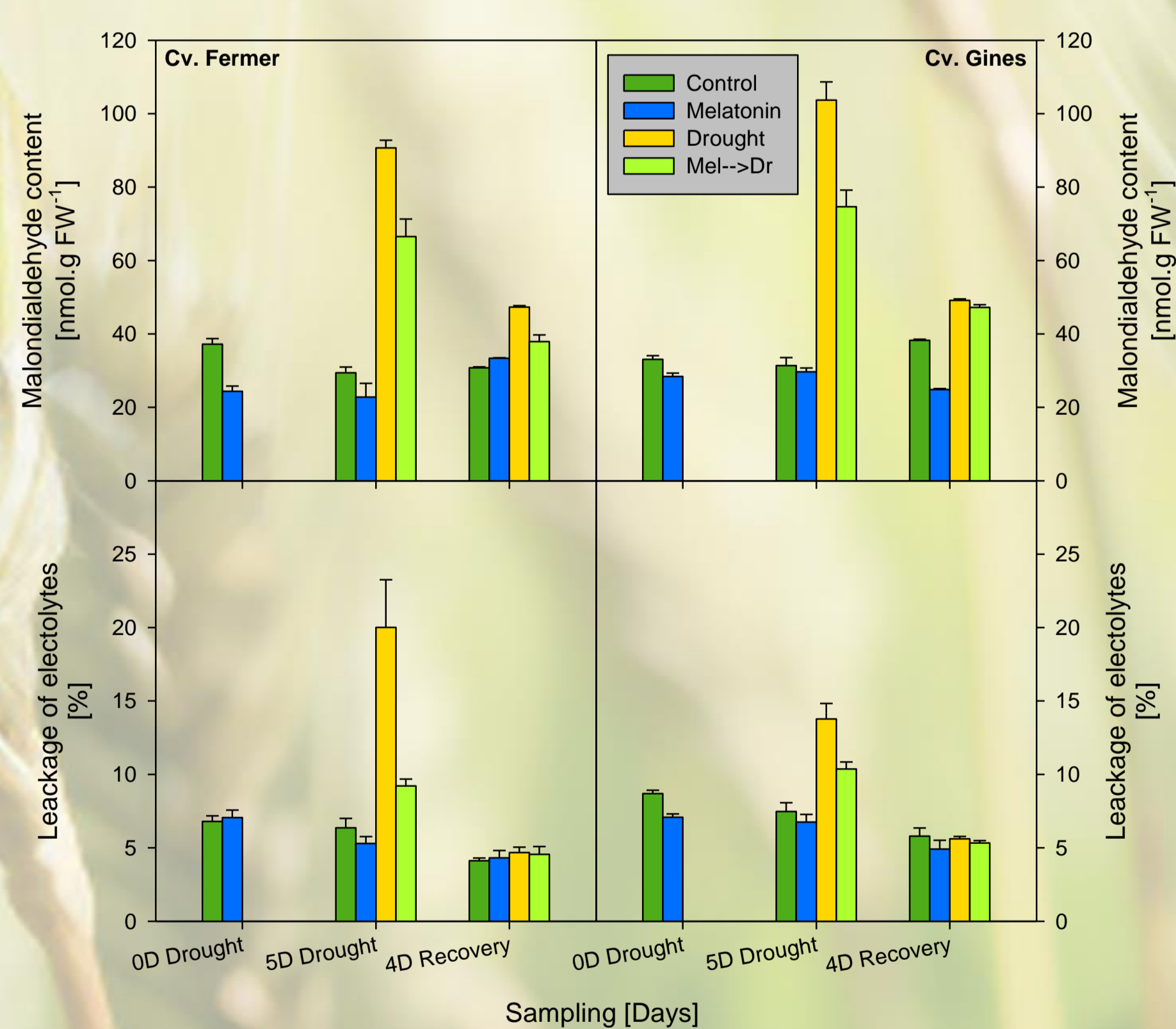
Soil grown 17-day-old wheat plants (*Triticum aestivum* L., cv. Fermer and cv. Gines) were root supplemented with 75 μmol melatonin and 24h later were subjected for 5 days to drought. After the end of the stress period the normal regime of irrigation was restored and plants were left for recovery. The data were recorded in the beginning and at the end of the stress period and after 4 days of recovery. Biometric parameters, and content of selected stress biomarkers malondialdehyde (Kramer et al., 1991), free proline (Bates et al., 1973), hydrogen peroxide (Alexieva et al., 2001), and relative electrolyte leakage (Cui et al., 2017) were measured. The data presented are mean values with standard error.

Results

- ❖ The application of melatonin alone did not cause notable alterations in parameters measured.
- ❖ The water stress enhanced the content of stress markers (malondialdehyde, free proline, H₂O₂, relative electrolyte leakage), and diminished biometric indices length, fresh weight, dry weight and water content of seedlings.
- ❖ During the stress period melatonin decreased the negative outcome provoked by drought.



Free proline and hydrogen peroxide content in leaves of wheat plants treated with melatonin and subjected to drought stress.



Malondialdehyde content and leakage of electrolytes in leaves of wheat plants treated with melatonin and subjected to drought stress.

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Conclusion: Melatonin application decreased the negative consequences of drought stress in the tested wheat varieties.

