

# INFLUENCE OF STRESS / DROUGHT ON WHEAT GRAIN QUALITY

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## INTRODUCTION

According to data from the literature, the great importance of water and temperature regime in agricultural production has been established. The World Meteorological Organization (WMO, 1992) defines drought through several phenomena as a prolonged absence or pronounced deficit of precipitation, a period of unexpectedly dry weather in which the lack of precipitation causes a serious hydrological imbalance, a deficit of precipitation that causes a lack of water for a specific activity. According to these phenomena, drought/stress can be divided into meteorological drought, which is caused by a reduced amount of precipitation compared to the multi-year average or a complete absence of precipitation in a certain period of time. hydrological drought is a precipitation deficit over a longer period of time that affects surface and underground water supplies: the flow of water in rivers and streams, the water level in lakes and the level of groundwater. When flows and levels decrease, we speak of a hydrological drought. The beginning of the hydrological drought can lag several months after the beginning of the meteorological drought, but it can also last even after the end of the meteorological drought. Agronomic drought is a short-term lack of water for a period of several weeks in the surface layer of the soil, which occurs at a critical time for plant development, can cause agronomic drought. The onset of an agronomic drought may lag behind a meteorological drought, depending on the condition of the surface layer of the soil. High temperatures, low relative humidity and wind intensify the negative consequences of agronomic drought. The yield and quality of grain are conditioned by the climatic conditions of production, implemented agrotechnical measures, soil fertility and the choice of genotype.



## MATERIAL AND METHOD

The goal of the work is to determine the reaction of the wheat genotype to stress conditions in achieving grain yield and grain quality by analyzing the amount and distribution of precipitation depending on the locality of production. Polish experiments were conducted in 2021 and 2022, on three wheat varieties of the Osijek Agricultural Institute (Kraljica, Vulkan, Tika-Taka) at three locations in the Republic of Croatia (Vukovar, Slavonski Brod, Beli Manastir). In the Polish experiment, the usual agrotechnics and fertilization in wheat production were applied (150kg N/ha, 100kg/ha P<sub>2</sub>O<sub>5</sub>, 120kg/ha K<sub>2</sub>O). Weighing of grain yield was done on a truck scale when grain samples were taken for chemical analysis. The yield of natural grain is determined at 14% water content in the grain. Agrochemical analysis of grain was determined in the laboratory of the Agricultural Institute Osijek on NIR DA 7250.

## CONCLUSION

The grain water content at harvest was from 9.67% to 13.62%, protein content from 10.37% to 15.85%, gluten from 20.59 to 34.67%, grain hardness from 67.54 to 84 ,73%. The highest grain quality and yield in both years was found in the Kraljica wheat variety, and the decrease in grain yield due to the lack of precipitation in 2023 compared to 2022 was from 27 to 42%, depending on the location of the production experiment.

**Key words:** wheat, grain quality, grain yield