



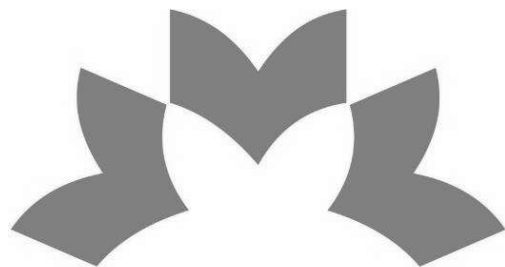
AGRORES

2019

BOOK OF ABSTRACTS



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Alterations of carotenoids in maize grain under different tillage and fertilizer dose

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Abstract

Fertilization in maize crop is important measure to achieve high yields and provide optimal grain quality, whilst soil tillage impacts the nutrients outtake of by crop. Carotenoids, are bioactive substances which vital for the human health, especially β -carotene which is actually provitamin A. In this study the impact of the reduced and conventional soil tillage in combination with N fertilizer applied in two doses (F1 - 180 kg N ha⁻¹ and F2 - 240 kg N ha⁻¹) on carotenoids content in maize grain was evaluated during 2016, 2017 and 2018. 50 kg P ha⁻¹ and 50 kg K ha⁻¹ were applied in the autumn, while N fertilizer was incorporated in the spring, prior to sowing. The concentration of carotenoids (lutein, zeaxanthin and β -carotene) was determined by using high performance liquid chromatography (HPLC). Meteorological conditions in 2016 and 2018 were favorable for maize growing, while a 2017 was a year with drought present. A higher maize yield in both soil tillage regimes was achieved in F2 treatment for all years, except in 2017 where a higher maize yield was achieved in conventional tillage in F1 treatment. The content of tested carotenoids in conventional tillage regime was higher in the F1 treatment when compared to F2 treatment for 2016 and 2018, opposite to 2017. Similarly, a higher concentration of analyzed carotenoids in reduced tillage regime was achieved in F2 treatment for all tested years, in comparison to the F1 treatment. Obtained results revealed that the concentration of carotenoids in conventional tillage was inversely proportional to the maize yield opposite to reduced tillage, for all tested years. Results show that the higher content of carotenoids in conventional tillage was achieved with a lower dose of N fertilizer, contrary to reduced tillage.

Key words: Maize; Carotenoids; Nutritional quality; Nitrogen fertilizer; Tillage.