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THE EFFECT OF $CACO_3$ ON THE K CONTENT IN OAT LEAF

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Abstract

Acid soils have characteristic morphological properties and they undergo the process of gleying. They are also poor in water content, aeration and texture. Being of comparatively poor structure, the acid soils are deficient in alkalis and in organic matter so they are generally extremely acid. The current study was focused on liming as a soil amendment measure as well as on determining the oat leaf content of K in the cultivar Mediteran. Soil pH was 5.01 in 2007 and 5.11 in 2008. The variants used included increasing Ca rates compared to the control (the treatments were as follows: T1, T3 and T4 + control – without liming). The trial was conducted under the controlled conditions. The leaf content of K was determined during the flowering and full maturity phenophases. Gleying was performed using atomic absorption spectrophotometry. The content of K in oat leaf was the highest prior to liming with 4 g $CaCO_3$ in 2008 over the flowering phenophase (1.634% dry organic matter) and the lowest in the control variant over the same phase in 2008 (being 0.721% dry organic matter).

Key words: *oat, liming, pseudogley, leaf, calcium*

Introduction

The most limiting factors of plant cultivation on the pseudogley type of soil are considered to be its acid reaction, low content of humus as well as poorly contained phosphorus, potassium, calcium and nitrogen. Such soils also contain considerable amounts of mobile bonds of aluminum that are toxic to plants (Foy, 1984). The detrimental effects of aluminum and its presence were corroborated by the findings of Babovic (1960). In addition, Bartlett and Riceo (1972) found the solubility of the aluminum and iron hydroxides to be rather low at pH from 5.0 to 5.5, whereas, above these values, their content was none even in their modified form. One such measures is a more massive introduction of the recently released wheat, which have shown a high production potential even under stressful climatic conditions, and the significant measure is to increase and improve the soil fertility level (Dencic et al., 2006). The research results reveal more than 60% of acid soils accounting for low productivity soils and simultaneously acting as a highly limiting factor of plant production (Djalovic et al., 2010).

Materials and methods

The soil sample for the current research was taken from the region of Ivanjica being characteristic of acid soils and of the plant production being made rather difficult. The experiment lasted two years (2007 and 2008). It was done with five replications, with the experimental variants having increasing Ca rates ($CaCO_3$ added to already prepared soil) + the control one. Lime granulation was 0.3 mm. The trial variants were, as follows:

T_1 – control + 0.1% $CaCO_3$ of the soil weight per vegetation container