

Metabolic Activities in Seedlings of Maize (Zea Mays Linn. CV. Farz 34) in Relation to Boron Nutritional.

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Abstract:

The responses of maize seedlings to boron nutritional stress were investigated. One group of seedlings was deprived of boron while two other groups were subjected to supraoptimal concentrations of boron conditions by feeding them with five and ten times the optimal concentrations of boron.

The effects of supraoptimal concentrations and/or deficiency of boron on the growth rates (as measured by their fresh and dry weights) as well as on the formation of chlorophylls, the specific activity of the ATPases, oxidative phosphorylation, succinate-, malate- and glutamate dehydrogenases, and on the level of mitochondrial quinones were studied.

One supraoptimal boron level (X10B) increased the fresh and dry weights of the seedlings while the other supraoptimal level (X5B) and the deficiency conditions decreased these parameters. Both the supraoptimal boron levels and boron deficiency conditions decreased the amounts of chlorophyll pigments.

The specific activity of the respiratory enzymes as well as the level of mitochondria quinones were enhanced under the deficiency and one supraoptimal level (X5B) conditions; the increase being greater in the former group of seedlings. The other supraoptimal level (X10B), however, decreased the activity of the respiratory enzymes.

Keywords: Metabolism/ nutrition/ seedlings/ oxidation/ boron/ enzymes/ mitochondria/ quinones

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