

EFFECT OF BORON ON THE ACTIVITY OF NITRATE REDUCTASE IN YOUNG SUNFLOWER PLANTS

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It has been found that both boron (B) deficiency and excess affect the activity of many enzymes and thus the metabolism of numerous compounds in plants. B has been found to affect the metabolism of nitrogen compounds; free aminoacids and nitrates increase when B is deficient. We decided to study the effect of different level of B provision on the primary assimilation of nitrogen, i.e., on the activity of nitrate reductase (NR). Research object were 30-day old sunflower plants which were grown in water culture with 1, 5, 25, 100, and 500 $\mu\text{mol B}\cdot\text{dm}^{-3}$. We analysed the contents of N and B, mass of certain plant parts, and the initial and total NR activity in the root, above-ground part, third and fourth leaf. The following conclusions were drawn. Dry matter mass and plant height varied considerably when exposed to B deficiency or excess. The increase of B concentration in the nutritive medium lowered the moisture content in the above-ground plant part and increased the content of B, more in the above-ground part than in the root. The total contents of N in the root and above-ground part were highest at 5 and 25 $\mu\text{mol B}\cdot\text{dm}^{-3}$; the content of NO_3^- was reduced more in the above-ground part than in the root at increased concentrations of B (Figure 1). The initial and total activities of NR were highest at 100 $\mu\text{mol B}\cdot\text{dm}^{-3}$ in the root, third and fourth leaf (Figures 2 and 3). B deficiency and excess restricted the activity of NR more in the root than in the studied leaves. Further studies are necessary to determine specific effect of B on the activity of NR.

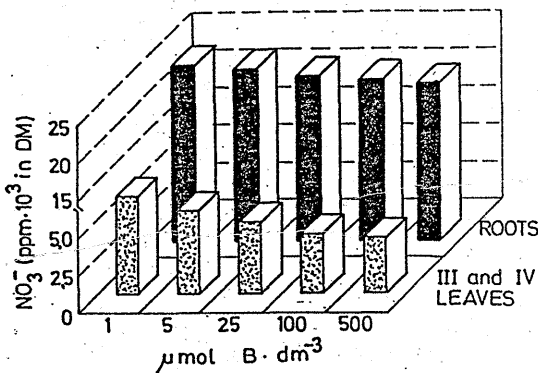


Fig. 1.—Effect of B nitrate content in sunflower leaves and roots

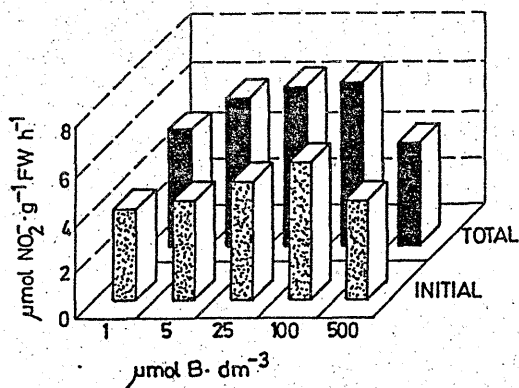


Fig.2.-Effect of B on initial and total NRA in sunflower leaves

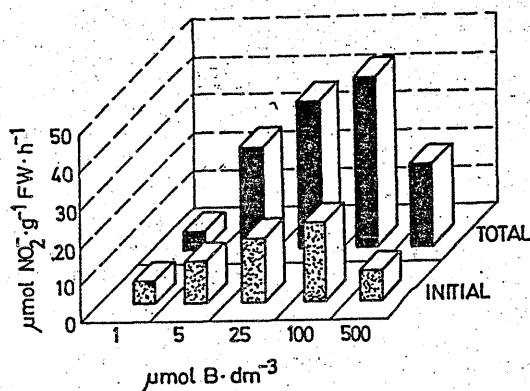


Fig.3.-Effect of B on initial and total NRA in sunflower roots

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