**Objectives:** Boron toxicity in cereals caused by excessive boron in the soil occurs in many dry areas of the world. The objective of this study was to investigate the effect of mannitol, which increases resistance of plants against biotic and abiotic stress, on boron toxicity of sensitive (Mirzabey-2000) and tolerant (Ikizce-96) wheat cultivars.

**Materials and Methods:** Two Turkish wheat cultivars, durum wheat (tetraploid-AABB) sensitive to B toxicity T. durum Desf. cv. Mirzabey-2000 and bread wheat (hexaploid-AABBDD) tolerant to B toxicity T. aestivum L. cv. Ikizce-96 were used as donor plants. Seeds of cultivars were obtained from Field Crops Central Research Institute belonging to Ministry of Agriculture and Rural Affairs in Ankara.

Plants were grown under controlled conditions in growth chamber for 8 weeks at 21-25°C with a photoperiod of 16/8 h (12 klux). Different concentrations of boric acid (0, 30, 45, 60 mg kg\(^{-1}\)) and M (0, 1, 5, 10 g kg\(^{-1}\)) solutions were added to the soil and eight weeks grown seedlings were harvested for data analysis. B content of wheat leaves were analyzed with ICP-OES device.

**Results:** According to the B analysis results obtained from ICP-OES, significant decreases in leave B content were observed under B treatments with all M applications in both wheat cultivars. Whereas the leave B content under 30 mg kg\(^{-1}\) B toxicity decreased most with 10 g kg\(^{-1}\) M application in durum wheat, it decreased most with 5 and 10 g kg\(^{-1}\) M applications in bread wheat. In both cultivars, compared with leave B content, the highest results under 45 mg kg\(^{-1}\) B concentrations were obtained with the application of 5 g kg\(^{-1}\) M. Also, 1 g kg\(^{-1}\) M application gave good results in bread wheat. Whereas the leave B content under 60 mg kg\(^{-1}\) B toxicity decreased most with 5 g kg\(^{-1}\) M application in durum wheat, it decreased most with 1 g kg\(^{-1}\) M application in bread wheat.

**Conclusion:** The experimental results showed that, sensitive and tolerant wheat cultivars affected different under toxic B concentrations in soil and these concentrations cause an increase in leave B contents. The decrease in leaves with M applications, depending on B toxicity on durum and bread wheat cultivars reveal that M is effective in overcoming B toxicity. On the other hand, the B analysis carried out on the samples taken from leaves suggest that durum wheat (Mirzabey-2000) is more prone to the effects of B than that of bread wheat (Ikizce-96) and it also demonstrates that B toxicity can be reduced with the use of M treatments.

**Key words:** Boron toxicity, bread wheat, durum wheat, ICP-OES, mannitol

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