BORON TOLERANCE IN FIVE BARLEY VARIETIES

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ABSTRACT

Boron tolerance in five barley varieties was studied in a pot culture experiment. Variety 5378 (German) appeared most resistant due to least B accumulation which resulted in highest relative yield, while Cerice (German) appeared least resistant with least relative yield and highest B accumulation. Taking relative yield into account, variety Pak-30130 appeared better than both Jou-87 and Pak-30046 which were at par but Jou-87 had an edge of better B tolerance. Tolerance to B was not related with Ca content and Ca/B ratios in plant tissue.

INTRODUCTION

Boron toxicity is suspected in some regions of Pakistan (Sillanpaa, 1982). The only way to cope with the problem is growing tolerant crop cultivars on calcareous soils (Kausar et al., 1990). Barley, due to its salinity tolerance (USDA, 1954) is gorwn on marginal and/or saline lands in Pakistan (Bajwa, undated) where high B is often associated with other salts (Cartwright et el., 1987). Mehrotra et al., (1980) and Cartwright et al., (1987) reported differential tolerance of several wheat and barley varieties to excessive soil B under field and solution culture conditions. Similarly, Kausar et al. (1990) reported that less efficient but high B requiring wheat cultivars were more B tolerant. However, the information on the subject is scanty. This paper reports

growth period. Grain yield was recorded at maturity. Grain and straw were ground to a fine powder in a Wiley mill. Boron in straw and grain was determined by dry ashing and colour development with azomethine-H (Shanina et al. 1967). Data obtained were analysed statistically.

RESULTS AND DISCUSSION

Boron Tolerance in Barley

At seedling stage (10 days old), plants of all varieties in all B treated pots turned pale. Later on, leaves developed peculiar brown lesions which varied among varieties with respect to size and density. In severe case, stems were weekened and plants appeared lodged. Similar symptoms in relation to B toxicity were noted for the first time by Kausar and Cartwright (1984). About 50% of applied B was extractable after two weeks of soil incubation. In our earlier studies, similar amounts of B were found extractable in a red brown earth of South Australia (Kausar and Cartwright, 1984). Elrashidi and Connor (1982) found attainment of equilibrium in 12 hours but they opted 23 hours time for their studies. As we were concerned with the pot culture studies, we selected 2 weeks time to be more on the safe side.