Bul. Agron. 23 (1) : 42-55(1995)

EFFECT OF CALCIUM ON THE GROWTH AND ION UPTAKE IN NaCl-STRESSED PLANTS[1)]

By :

Didy Sopandie[2)], Toshio Kawasaki[3)] and, Masumi Moritsugu[3)]

ABSTRACT

Peanut and kidney bean gave similar responses to salt stress showing a more severe growth reduction, as compared to spinach, leaf beet, barley cultivars and wild barley. Calcium showed the protective effect on salt injury in all plants, the effect of which was more pronounced in spinach, leaf beet and both types of barley plant than that in bean and peanut.

High concentrations of NaCl decreased the content of K, Ca and Mg in both shoot and root of all plants. Elevated Ca in the nutrient solution, however, considerably alleviated the inhibition of K uptake due to NaCl. The result suggested that the maintenance of K/Na selectivity by Ca in plant might result in the enhancement of salt tolerance.

RINGKASAN

Kacang tanah dan buncis memberikan respon yang sama terhadap stres garam, yang memperlihatkan pertumbuhan yang lebih buruk dibandingkan dengan spinasi, bit, dan barley. Pemberian kalsium dapat mengurangi tingkat kerusakan akibat stres garam; pengaruh ini lebih nyata terlihat pada spinasi, bit dan barley.

Konsentrasi NaCl yang tinggi menurunkan kandungan K, Ca dan Mg pada pucuk dan akar seluruh tanaman. Peningkatan konsentrasi Ca pada larutan hara dapat mengurangi penghambatan serapan K oleh NaCl. Selektivitas K/Na yang tinggi yang dapat dipertahankan karena adanya Ca diduga berkaitan dengan peningkatan daya toleransi tanaman.

---

1) Part of Doctoral Thesis

2) Jurusan Budidaya Pertanian, Fakultas Pertanian, Institut Pertanian Bogor

3) Res. Inst. Biores,. Okayama University, Japan