MINOR ELEMENT STUDIES WITH SOYBEANS: I.
VARIETAL REACTION TO CONCENTRATIONS OF ZINC
IN EXCESS OF THE NUTRITIONAL REQUIREMENT

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HERE is usually considerable variation among plant varieties
of a given species in reaction to temperature (6, 8, 10, 15),
drought (5, 16), disease (1, 9, 19), insects (3, 12, 13, 17),
etc. It is likewise known that plant varieties react differently in the absorp-
tion and metabolism of at least some of the chemical elements.
Such varietal differences have been noted by Anderson and Ayre
(2), Burkholder and McVeigh (4), and Hoener and DeTurk (11)
for nitrogen; by DeTurk, et al. (7), Lyness (14), and Smith (18)
for phosphorus; by Weiss (20) for iron, and by Allen (4) for several
of the major elements. Yamasaki (21) observed the differential
behavior of rice and wheat varieties to copper sulfate, sodium
arsenate, zinc chloride, mercuric chloride, potassium dichromate,
kobalt cyanide, potassium perchlorate, potassium iodate, potas-
sium bromate, and potassium and sodium chlorate. From his experi-
ments, he concluded that definite varietal distinctions existed only
with respect to the chlorates and that the basis for this distinction
is the differential ability of the plants to reduce the nontoxic chlorate
ions to the toxic hypochlorite ions.

With reference to the effect of the other chemicals tested for
varietal reaction, Yamasaki (21) stated that, "All of the salts tested
other than the chlorates, KClO₃ and NaClO₃, injured the seedlings
very seriously as a whole but never showed the varietal distinctions
as observed in relation to KClO₃." This statement is believed by
the writer to be unjustified on the basis that Yamasaki correlated
the results of an experimentally determined concentration of KClO₃
(0.2%) with those from an equal concentration of ZnCl₂, and con-
cluded therefrom that the latter was incapable of inducing varietal
distinction. Had he experimented as thoroughly with different
concentrations of the other salts as he did with the chlorates, he
probably would have discovered that varietal distinction to direct
toxicants is a matter of salt concentration rather than salt specificity.

The purpose of this paper, therefore, is to call attention to the