Sampling Soybean Roots: A Comparison of Excavation and Coring Methods. (S08-nissen122827-Poster)

Authors:

- T.M.Nissen - *Univesity of Illinois*
- V.V.Rodriguez - *University of Illinois*
- R.Matamala - *Argonne National Laboratory*
- J.D.Jastro - *Argonne National Laboratory*
- M.M.Wander - *University of Illinois*

Abstract:

An in-season, in-field soybean root-sampling protocol was designed to meet three objectives: 1) gather sufficient material for simultaneous measures of root and nodule biomass, root length and density, and rhizosphere-soil community structure; 2) minimally affect surrounding sampling area; and 3) minimize problems of variability and scaling subjectivity associated with coring methods without greatly increasing labor intensity. The new protocol involves digging a pit 25 cm long x 38 cm wide (soybean-row width) x 25 cm deep, comprised of 3 zones. Zone 1 is a volume directly around the tap roots to 12.5 cm depth, removed from the field and washed in its entirety in the lab; Zones 2 and 3 are the remaining soil to 12.5 and 25 cm depth respectively, weighed in its entirety but sieved, mixed, and subsampled, with remaining soil returned to the pit. Excavation volumes are checked with plastic bags filled with a known volume of small LECA clay pellets. For deeper sampling, cores are taken from the bottom of the pit. Mean C.V. for six sampling dates in the first year was 27%, sensitive enough to find significant differences between CO2 treatment levels. Variability and labor-intensity are compared with core sampling from the same experiment.

Corresponding Author Information:

Todd Nissen
University of Illinois
N-215 Turner Hall, 1102 S. Goodwin Ave.
Urbana, IL 61801

phone: 217-333-4912
fax: 217-244-3219
e-mail: tnissen@uiuc.edu

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