

- Wilson, S.B., Nihal C. Rajapakse, and R.E. Young.** 1998. Low temperature storage of micropropagated hosta under various light qualities. SNA Res. Conf. Proc. 43:320-323.
- Zilis, M.R.** 1981. Tissue culture propagation of hosta. Amer. Hosta Soc. Bull. 12:19-20.
- Zilis, M.R., D. Zwagerman, D. Lamberts, and L. Kurtz.** 1979. Commercial production of herbaceous perennials by tissue culture. Comb. Proc. Intl. Plant Prop. Soc. 29:404-414.
- Zumbar, B.** 1991. Beginners' propagation of hostas by rossizing, an update. Hosta J. 22(1):19-20.

Evaluation of Root Exudate Production in Six Sorghum Accessions: Chemistry and Root Morphology Studies

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Sorghum (*Sorghum bicolor*) has been used for several decades as a cover crop during crop rotation in nursery production. Sorghum is one of a number of plant species which produce natural products involved in pest management. Sorgoleone production in sorghum has been identified as a component of the exudate associated with the inhibition of other plant (weed) growth.

A detailed study was performed in order to compare root-exudate production and chemistry in six different sorghum accessions (SX - 15, SX - 17, 855F, 8446, Della, and johnsongrass). Comparisons were based on the quantity of root exudates produced and related chemical constituents within each extract. In order to provide mass quantities of root exudates, a novel system of root-exudate collection was developed using a capillary-mat system for seedling growth. Six sorghum accessions were then grown on this system and roots exudates were collected, dried, and weighed. Components of these root exudates were then separated via reverse-phase HPLC, with UV detection set at 280 nm. Each accession differed with respect to the quantity of root exudate produced. Moreover, the amount of each chemical constituent produced varied by sorghum accession. To further understand how the root exudates of sorghum are produced, gross root morphological studies utilizing light microscopy and CryoSEM were performed. These two techniques revealed that root exudates are produced and released by root hairs. Ultrastructure studies were performed using transmission electron microscopy and showed that root exudates are being deposited between the plasmamembrane and the cell wall before secretion of the hydrophobic droplets by the root hairs. Intracellularly, exudate production appears to originate in the endoplasmic reticulum.