Comparing Methods of Measuring Nutrient Uptake by Intact Roots of Mature Trees. (S07-mcfarlane095656-Poster)

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Abstract:

Freshly excavated roots often leak nutrients in uptake experiments, possibly due to disturbance to roots during excavation. Three types of pretreatments were used to study the effects of disturbance and subsequent recovery on nutrient uptake. Prior to experiments, (1) Trained roots were excavated, pruned, and allowed to grow in a sand-soil mixture for six to ten months; (2) Recovered roots were excavated and exposed to nutrient solution for two to four days; and (3) No recovery roots were excavated and used immediately. The effect of pretreatment on uptake rates was nutrient and species specific. Trained roots showed the highest magnesium uptake for sugar maple (Acer saccharum Marsh.), red pine (Pinus resinosa Ait.), and Norway spruce (Picea abies (L.) Karst.). For the same species, trained and recovered roots showed potassium uptake, while no recovery roots leaked potassium. No recovery roots had the highest uptake of ammonium for sugar maple, but the lowest ammonium uptake for Norway spruce. No recovery pin cherry (Prunus pensylvanica L. f.) roots showed the highest calcium uptake. No single pretreatment resulted in positive uptake of all nutrients for all species studied.

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