Water and Nutrient Stresses Increase Root Exudation. (C02-henry181247-Oral)

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Abstract:

Root-zone stress may increase the production of root exudates and enhance phytoremediation. Increased carbon in the rhizosphere can support higher levels of contaminant-metabolizing microorganisms. Root exudates can also chelate contaminants and change the soil pH, which can alter solubility and plant uptake. We studied the effects of four types of stress on the release of root exudates. Crested wheatgrass was grown under sterile conditions for 70 days. Low potassium, high ammonium, drought, and flooding stresses were induced beginning on day 35 by altering the composition and frequency of application of the nutrient solution. Exudates were measured in the leachate using a Total Organic Carbon analyzer. Root exudation rates were increased by about 30% under K+ stress, 10% under high ammonium, 70% under drought, and 60% when flooded as compared to the controls. These results indicate that cultural manipulations can increase root exudation and may enhance phytoremediation.

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