



The Effects of Trichloroethylene on the Germination and Early Development of Radish, Butternut Squash, Corn, and Soybean

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ABSTRACT

Trichloroethylene (TCE) is a small molecule used as a metal degreaser and as an extraction solvent for lipids. Historically, TCE has been used to clean missiles and rockets after testing at military sites. However, TCE has decreased in use due to its potential health hazards. TCE is particularly dangerous because it is soluble in water and easily seeps into ground water. As a result, TCE has contaminated groundwater in Mead, Nebraska. The town is near the former Nebraska Ordnance Plant, a military factory specializing in bomb assembly, ammonium nitrate production, and explosives burning. Soil sampling in Mead indicated TCE levels as high as 10,000 µg/L, with most positive sites testing greater than 10 µg/L. There is little information concerning the effects of TCE on local flora or agriculture, most of it focusing on human health. In this study, we evaluated the effects of TCE on germination and early seedling development of radish, butternut squash, corn, and soybean. Seeds were dosed with TCE concentrations ranging from 0 µg/L – 100,000 µg/L and allowed to grow until the first foliage leaf emerged. We observed each developmental landmark, and measured root length. This knowledge will give insight into the effects of TCE on the development of common Nebraska crops and aid in agricultural decision making.

METHODS

RESULTS

INTRODUCTION

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