Paired Planting of Sunflower (*Helianthus annuus*) and Indian Mustard (*Brassica juncea*) for Improved Lead Phytoextraction

Lead is a common and persistent soil pollutant and has been shown to have significantly negative neurological impacts, even at extremely low exposures. Soils contaminated from leaded gasoline and paint present a significant risk to the public, especially children. While many solutions involve removing or sealing soil, phytoextraction is a technique where plants are grown to accumulate soil contaminants and leave the soil intact. The goal of this research was to determine the ability of mixed versus individual plantings of sunflower (*Helianthus annuus* L.) and Indian mustard (*Brassica juncea* (L.) Czern.) to accumulate lead from contaminated soils. A greenhouse study was conducted with three experimental groupings of plants: only sunflowers; only mustard; and ½ sunflower & ½ mustard. Plants were grown in ~1000 ppm lead-contaminated yard soil collected from Burlington and amended to 3:1 soil:perlite ratio. After two months, plants were harvested and the root and above-ground tissues were analyzed separately for lead content by ICP-AES following microwave-assisted nitric acid digestion. Sunflowers were found to have average above-ground tissue concentrations of 60 mg/kg while mustard plants were only found to have 35 mg/kg, regardless of whether each species was grown together or separately. Average dry weights for sunflowers were 0.60 g while average mustard dry weight was 0.40 g. Mixing the plants had no effect on how much lead an individual species accumulated. While no positive synergy between plants was found, the lack of deleterious effects on growth or lead uptake suggests that mixed plantings may be useful for increasing planting density or perhaps reducing pest susceptibility of plants. Further studies focusing especially on other mixed plantings and longer time scales may yield innovative insights or solutions to our persistent and toxic legacy of lead pollution.