Per- and poly-fluorinated alkyl substances (PFAS) are valued for their ability to repel both water and oils. They have been used for decades for diverse applications such as water repellent for fabrics, stain-resistant carpets, non-stick frying pans, metal plating, industrial surfactants, resins, molds, plastics and firefighting foams. Perfluorooctanoic acid (PFOA) and Perfluorooctane sulfonate (PFOS) were the primary compounds in Teflon and Scotch Guard respectively. PFAS compounds continue to receive increasing attention from environmental practitioners and regulatory bodies as compounds of environmental concern around the world. Over the past few years, there have been lessons learned in the measurement of PFAS contamination in the environment. From the perspective of the testing laboratory, the list of PFAS being routinely analyzed continues to grow with over 31 compounds currently measured at AGAT Laboratories and 6 more to come soon. In an effort to decrease the impacts associated with the traditional PFAS compounds, industry has created what are called replacement compounds such as GenX, ADONA and F35, which are now also gaining attention as potentially toxic and more mobile than traditional PFAS compounds.

Many of the PFAS compounds including GenX are currently not regulated by American or Canadian federal health agencies, due to lack of toxicological data. We will present data from a study we are conducting which looks at phytotoxicity of PFAS. In this study, phytotoxicity was assessed using plant germination and growth tests on artificial soil. Uptake from soil to root and shoot was measured on barley and lettuce. Results showed that phytotoxicity of PFOS is higher compared to PFOA and GenX. Phytotoxicity of GenX is similar to PFOA. PFOS and PFOA are transferred from soil to roots and shoots and can be found in higher concentrations in roots. Interestingly, concentrations of GenX are much higher in shoots compared to roots.

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