

A Proposed Minimum Data Set for Plant PFAS Uptake Studies in Agriculture

The discovery of per- and polyfluoroalkyl substances (PFAS) contamination of farmland has prompted extensive in situ studies of PFAS uptake by agricultural crops. The short-term goals of many of these studies are to assess risk, establish regulations and recommendations concerning soil PFAS concentrations, and evaluate mitigation options. As well, in the longer term, the data from these studies could provide invaluable datasets for continuing research on the fate and transport of these emerging contaminants through agricultural systems, including meta-analyses and simulation modeling. For this to be possible, the datasets and published research must include a core set of details and parameters. We propose a minimum dataset of descriptive and measured information to serve as a standard for plant PFAS uptake studies in agricultural systems. Following Brouder and Gomez-Macpherson (2014), our objectives for a minimum dataset were to select information and parameters that: meet the criteria for peer-reviewed publication; satisfy criteria for simulations modeling, meta-analysis, and collaborative research; are easy enough to adopt; and help elucidate observed phenomena and effects. Descriptive information includes location, weather with weather station specified, soil classification, and history of crops, crop management, and biosolid applications. Measured soil parameters are those typically included in a standard soil test plus total organic carbon, texture, and if possible, bulk density. Measured plant parameters include species and composition, growth stage and rooting depth at sampling, and crop yield. We will present examples from our field research of parameters that are often not reported but that can influence plant PFAS uptake results.