Exploring and Detecting PFAS in Missouri Farmland Soil

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PFAS chemicals, or polyfluorinated substances, are commonly found in household products, such as non-stick cookware, waterproof materials, and fabrics. If soil samples from soybean and corn fields are analysed using infrared spectroscopy, then PFAS chemicals will be detectable in the samples. Most PFAS samples found in soil samples have used a method to determine their presence called LC-MS or Liquid chromatography-mass spectrometry, this study brings a novel approach to this detection by allowing the researcher to use Infrared spectroscopy instead, this change enables more availability in detection to farming communities, most local labs have equipment. In this study, PFAS chemicals were detected and analysed using IR. The researcher tested local soil samples from the southeast Missouri farmers' fields to determine the presence of PFAS in the soil. The researcher obtained bean and corn field soil samples from which the PFAS was extracted. The samples were then evaporated and evaluated for total PFAS chemical content using IR and compared to known data for a part of the PFAS compound since this is a novel approach. Using this Infrared Spectroscopy (IR) method we were able to detect PFAS in the samples at around 11 cm-1 in 75% of samples tested. This novel way of detection proves that this procedure could make detecting PFAS in agricultural fields more efficient and cost-effective. Farmers are increasingly dealing with PFAS chemicals seeping into farmland and need to find an alternative to using LC-MS and allowing farmers access to determine how much PFAS is in their fields.

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