

Executive Summary

A Scoping Review of PFAS Mitigation Strategies for Soil, Water, and Experimentally Exposed Fruits and Vegetables (2026)

This FDA-funded scoping review examined the scientific literature relating to interventions intended to reduce per- and polyfluoroalkyl substances (PFAS) in water, soil, fruits, and vegetables. The review identified 107 relevant studies, including 81 focused on water, 32 focused on soil, and only 7 that examined edible plant-based outcomes.

The authors found that PFAS contamination of agricultural environments is a significant concern because PFAS can persist in soil and water and may be taken up by food crops. However, the review concluded that scientific understanding of PFAS uptake into edible plants remains limited, with relatively few studies investigating food-growing environments compared with water treatment and soil remediation.

A key finding was the lack of consistency across the scientific literature. Studies used different intervention methods, different soil types, different plant species, and different outcome measures, making comparison difficult. Very few interventions had been independently replicated by multiple research groups, preventing robust conclusions about which mitigation approaches are most effective.

The most frequently studied remediation approaches included adsorption technologies such as activated carbon and biochar, followed by electrolysis, photolysis, chemical oxidation, biological degradation, and thermal treatment. Despite the large number of studies, the authors concluded that there is currently insufficient evidence to identify a universally effective strategy for reducing PFAS contamination in agricultural settings.

The review highlights several important knowledge gaps. These include limited understanding of PFAS behaviour in food crops, uncertainty regarding how different PFAS compounds move through soil and plants, and insufficient research on fruit and vegetable uptake. The authors note that uptake can be influenced by factors such as PFAS chain length, soil composition, pH, organic matter content, and plant species.

Of particular relevance to food-growing areas, the review confirms that PFAS uptake by crops is a recognised phenomenon but remains poorly understood. The authors conclude that further research is needed before strong conclusions can be drawn regarding risks associated with specific crops, growing conditions, or contamination levels.

Overall, the review supports a cautious, evidence-based approach to PFAS contamination in agricultural environments. It demonstrates that PFAS can enter food crops, but also confirms that significant scientific uncertainties remain. The authors recommend additional research, improved reporting standards, and greater replication of studies to strengthen the evidence base for future policy and decision-making.