

PFAS:

What can I do to protect myself and my farm?

Knowledge is the best way to ease your worries and fears.

Here are some common questions farmers and landowners may have, and answers by soil scientists, University of Maine and Maine Department of Agriculture experts.

What are PFAS?

Per- and polyfluoroalkyl substances (PFAS) are man-made chemicals that are stable and persistent in the environment, bioaccumulative, toxic at low concentrations, and easily transferred to groundwater and other media.

Why should I be concerned?

PFAS accumulate in humans and animals. Studies suggest PFAS exposure can lead to increased cholesterol levels; changes in liver enzymes; decreased vaccine response in children; decreased birth weight; thyroid disease; increased risk of high blood pressure or pre-eclampsia in pregnant women; and increased risk of kidney or testicular cancer.

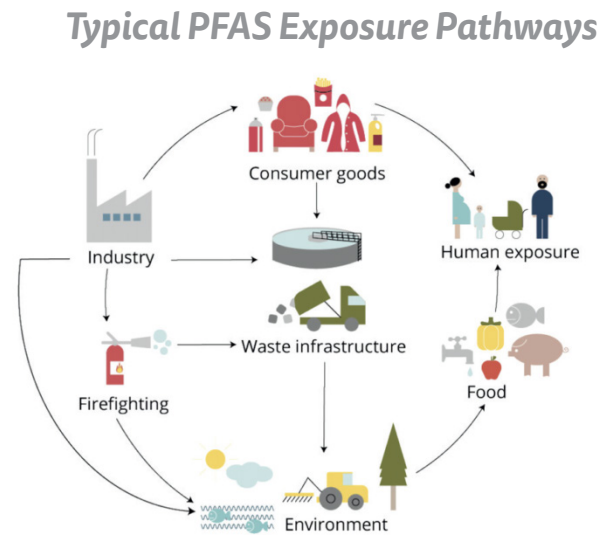
How did PFAS get in farm soils and water?

PFAS have been widely used in household products, such as Teflon, GoreTex, and Scotch Guard, and in industrial settings as early as the 1950's. Be-

cause of their broad usage, they can end up in our groundwater, drinking water, and soils, where they can enter the food chain. In particular, PFAS chemicals can end up in a wastewater treatment plant's sludge or in septic tanks from everyday household activities as well as from industrial sources. These sludge residuals (also called biosolids) have been permitted by many states to be spread on farm soils for the last several decades for beneficial reuse of organic material. Unfortunately, until recently, the presence of PFAS in these residuals was unknown by all who recommended and used them. There are residuals that are not regulated, like short paper fibers, which could contribute to PFAS levels, as well.

Can PFAS be removed from the soil?

PFAS are termed "forever" chemicals, so soil remediation is not considered a viable solution at the moment, however, scientists are exploring options.



Source: <https://www.eea.europa.eu/>

How can I find out if my soils were spread with contaminated sludge?

Maine DEP has a number of resources to review where sludge applications were permitted. <https://>

www.maine.gov/dep/spills/topics/pfas/. However, realize that a permit does not always mean that materials were applied and the permit information does not indicate the actual amounts that may have been spread.

If the land that you use has a history of biosolid use, you should become aware of the potential problems associated with PFAS. If there is no history of biosolids use, your level of concern should be very low. The only exceptions might be if your fields are adjacent to lands where biosolids may have been spread or whether there were fires in the area where significant amounts of fire fighting foam was used (such as in car fires etc.). PFAS in foam can end up in the groundwater.

Knowing what fields that might be at risk for high soil levels will allow you to make informed decisions about what to grow and how to handle the resulting product.

How do I test for PFAS?

Soils, water, forage and milk can be tested for the presence of PFAS. However, testing for PFAS must be carefully done. PFAS are so widespread in everyday products that samples themselves can be contaminated by PFAS unless specific protocols are followed. Testing is also very expensive. It is highly advisable to have a trained professional collect any samples from your farm. A pdf version of the full sampling protocol can be found on DEP's information page (see resources at the end of this document). There is a list of approved laboratories as part of that same pdf document.

What crops are most impacted by PFAS?

- Data shows that PFAS do find their way into the food system by animals consuming contaminated forages, feeds, and water with the resulting meat, eggs, and milk containing significant levels. (over, please)

- PFAS accumulate the most in leafy greens, grasses and legumes.
- PFAS accumulated less in fruits and grains such as corn.

Scientists understand how PFAS transfer from feed to milk. This information is helpful because it opens up options for farmers to change their feed strategy.

Scientists from the DEP and the University of Maine are coordinating efforts to gather data on farms in order to establish some baseline information about the uptake of these chemicals by many food and forage crops. Uptake is very variable across crops. There is still much to learn.

Are there crops that would be acceptable to plant on already contaminated fields?

The Maine CDC, DEP, UMaine and others are conducting trials to evaluate the transfer factors of PFAS into various forages, including grasses, legumes and corn (silage and grain). Preliminary and literature data indicate that uptake factors are *(over, please)*

highest in legumes (clovers and alfalfa) and lower in corn with little to no accumulation in corn grain. More data will be available in fall 2021 to evaluate the uptake factors. This information will be helpful to growers to make management decisions about their fields and alternative crops.

Are state agencies testing milk?

The Department of Agriculture, Conservation and Forestry periodically conducts retail sampling of fluid pasteurized milk in the state to determine the safety of the milk supply. Through this process, the Department has traced PFAS contamination in milk to two farms to date. The Department's Action Threshold for milk is 210 parts per trillion (ppt). Milk produced on farms that is over 210 ppt. is considered adulterated and may not be sold.

What supports are available to farms with higher than allowable limits?

The Department of Agriculture will link you with assistance like the federal program called the Dairy Indemnity Payment Program (DIPP) that facilitates paying producers for their discarded milk for a limited period of time. This program is administered by USDA's Farm Service Agency (FSA). The Department will also work with the producer to help determine and eliminate the source of contamination. The University of Maine Cooperative Extension and graduate students are available to assist in developing new feeding and cropping strategies.

If I test on my own, are my results private?

If you privately test your soil and feed, your results are private. DEP is sampling soils throughout the state that have been licensed to receive biosolids or regulated residuals, and those results are not private. If you test your milk, and your results are above the 210 ppt level set by the state, you should report these results immediately. The benefits of testing your soil and feed will give you the knowledge to manage your cropping and feeding programs to minimize potential milk contamination.

What is the State of Maine doing now?

The Legislature passed several laws pertaining to PFAS in 2021, including the Governor's budget to direct \$40 million to state agencies to help address PFAS issues. The Maine Department of Environmental Protection (DEP), the Maine Department of Agriculture, Conservation and Forestry (DACF), and the Maine Center for Disease Control and Prevention (Maine CDC) continue to investigate sites and materials for possible PFAS compounds, including:

- Public water systems near potential sources of PFAS;

- Groundwater, surface water, and private water supplies around Maine DEP cleanup sites, landfills, residuals land application sites, and Superfund sites;
- Retail milk supply;
- Vegetation (corn and hay) associated with agricultural feed for the dairy industry;
- Sludge, septage, and other residuals; and
- Fish tissue.

What is my next step?

If you have questions or concerns, contact your service providers from Cooperative Extension, NRCS, Dept of Ag, or MOFGA. Read more online at the following websites:

Maine DACF info page : <https://www.maine.gov/dacf/ag/pfas/index.shtml>

Maine DEP info page: <https://www.maine.gov/dep/spills/topics/pfas/>

MOFGA info page: <https://www.mofga.org/resources/toxics/pfas-maine-farmer-information/>

Attribution for graphic on PFAS lifecycle: European Environment Agency (2019). Typical PFAS exposure pathways [Online image]. <https://www.eea.europa.eu/publications/emerging-chemical-risks-in-europe>

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