

PFAS Workshop Developed Focal Point Topics and Their Roadmaps

Context for how the focal points and roadmaps were developed: The workshop, on Day 1, consisted of presentations by subject matter experts on eight broad areas where PFAS impact agriculture: Abatement; Data; Environment; Food; Livestock; Materials; Plants; and Socio-economic. On day 2, the attendees met in breakout sessions to identify the key research needs for agriculture in those eight broad areas, after which, the attendees ranked those and the coordinating committee determined where similar research needs were communicated as priorities by those breakout sessions. Those were presented to the attendees who then met on Day 3 to refine those (now called focal points) and develop high-level roadmaps of what activities would lead to solution development of those priorities and the impacts of those solutions. The following outline of those seven provides an overview of what was developed and provides a foundation for what experts and stakeholders can focus on to address them in the future.

1. Focal Point Topic: Analytical Methods and Validation needs for PFAS (needs expressed in the following working groups: Abatement, Environment, Food, Livestock, and Plants)

Roadmap title: *The need for rapid quantitative methods for PFAS*

Key Aspects

1. Validated & standardized methods for various matrices
2. Networks and forums/sharing information
3. Workshops & trainings
4. Lower cost of analysis

Impacts if completed:

1. Better methods => lower cost & quick turn-around time
2. Generated data will help farmers and communities and inform risk assessment for regulations
3. Trained workforce
4. Improved environmental & human health

2. Focal Point Topic: PFAS Alternatives, Abatement & Remediation (needs expressed in the following working groups: Abatement, Environment, Livestock, and Materials)

Roadmap title: *Reduce PFAS from agroecosystems while optimizing resource inputs*

Key Aspects

1. Replace PFAS in industry, textiles, fire-fighting foams, others
2. Immobilize PFAS so that it is not bioavailable from any matrix
3. Destroy PFAS completely, economically, and in environmentally friendly ways

Impacts if completed:

1. Remove 100's of tons of PFAs from food packaging in 5 years
2. Source reduction of PFAs entering agroecosystems
3. Deliver a toolbox for partial reduction of PFAs moving from agroecosystems to environmental systems
4. Develop water treatment systems to remove 90% of PFAs

3. Focal Point Topic: PFAS Thresholds and Action Limits (needs expressed in the following working groups: Abatement, Environment, Food, Livestock, and Socio-Economic)

Roadmap title: *Where and when to apply Thresholds and Action Limits to PFAS in Agroecosystems*

Key Aspects:

1. Screening and threshold levels for PFAS on all land applied sludges.
2. Mapping to show biosolid (all land) application history and PFAS levels

Identifying and Prioritizing Research and Programmatic Needs in the Detection, Mitigating, and Remediating PFAS in Agriculture and Food Systems Workshop – Developed focal points and roadmaps.

3. Soil Screening level testing (focusing on precursors, PFOA and PFOS, key PFAS entities) and recognize that these levels will be production system dependent
4. Plant-uptake and plant product thresholds
5. Plant-animal transfer factors and weighting factors for threshold development for livestock related edible tissues.

Impacts if completed:

1. Production of Maps showing biosolid applications, history, and status
2. Identification and measurement of field PFAS levels nationally, including soil mapping at important levels of resolution
3. Production of plant and Plant-animal transfer values will be available for multiple feed ration-animal combinations and that lead to understanding of safe food levels.

4. Focal Point Topic: Data Tools and Mapping (needs expressed in the following working groups: Environment, Food, and Plants)

Roadmap title: Development of a data integration structure and harmonization system for PFAS in agriculture and food production

Key Aspects

1. Establish trans-disciplinary data governance boards
2. Create data catalogue (inventory)
3. Integrate existing data networks into a common access node that is flexible and agile
4. Develop/establish best practices that include minimum data standards
5. Highlight use cases to develop and refine the overall process
6. Data integration structure and harmonization (DISH)

Impacts if successful:

1. Reduce redundancy in research
2. Fosters data transparency and trust amongst stakeholders
3. Improve efficiency of data queries
4. Identification of data gaps
5. Application within more complex tools
6. Foundation of communication output
7. Accelerates our understanding

5. Focal Point Topic: The Problems of PFAS Scale, Scope and Source Tracking Arising from Biosolids (needs expressed in the following working groups: Abatement, Environment, Livestock)

Roadmap title: Development of a Science-based Biosolids Management Program (The BMP)

Key Aspects

1. Background Levels
2. Actionable Thresholds
3. Testing Standardization
4. Data Repository

Impacts if completed:

1. Reduction in agroecosystem exposures to PFAS contamination.
2. Can then divert resources into combatting legacy PFAS contamination.
3. The BMP provides a roadmap for PFAS reductions in other systems (e.g., water reuse).

6. Focal Point Topic: PFAS Fate and Transport in Agricultural Systems (needs expressed in the following working groups: Environment, Food, Livestock, Materials, Plants)

Roadmap title: Development of solutions to the PFAS problems - in whole production systems: fate, transport and effective engagement

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Key Aspects

1. Predictive tools for PFAS transport through soil, plant, and animal
2. Understanding the effects on plant/animal species, physiology, and component partitioning
3. Evaluate production inputs and outputs
4. Develop guidelines for effective engagement to provide information on management options

Impacts:

1. State and federal agencies have stocked toolboxes for public health and regulatory decision
2. Improved engagement, trust, and technology transfer stakeholders and state cooperators
3. Foundational knowledge to inform critical production decisions
4. Building blocks for best management practices

7. Focal Point Topic: Communication and Education (needs expressed in the following working groups: Food, Materials, and Socio-Economic)

Roadmap title: Development of Targeted Communication Tools to help address uncertainty and provide evidence that generates assurance of good alternatives for PFAS-safe paths forward - for diverse audiences

Key Aspects:

1. Identify knowns (e.g., sites), known unknowns (baseline), unknown unknowns
2. Recognize key audiences: farmers=states; consumers, farm communities, producers (this is state-specific)
3. Have teams of teams who have expertise to address necessary topics
4. Recognize that much PFAS-centric information is available and is expanding, and is of different levels of quality. Build on the best information and ensure effective communication and transparency.
5. How do people respond to information and process and use it?
6. Ensure engagement across all relevant federal and state agencies and experts

Impacts if completed:

1. Better farmer, community and farmscape PFAS health
2. Farmer and consumer confidence
3. Informs late-adopters and helps them adopt