



Photo: Sullivan

## CROSS-CUTTING RESULTS FROM ROADMAP EFFORTS

Each focus area unearthed different perspectives and feedback, but there were common themes between focus areas, detailed below. Additionally, across focus areas there was a common emphasis on the need for production system-specific research, outreach and technical support, optimization of soil health metrics, and incentive programs.

### Goals and Priorities

Description: Positive soil health outcomes achieved through action.

- Soil health measurements and metrics that are standardized, inexpensive, and easily deployed.
- Easy access to equipment that maintains soil health (e.g., no-till seeder).
- Improved knowledge of soil health specific to production systems.
- Improved information dissemination to agricultural professionals and producers.
- Greater valuation of soil health in the marketplace.
- Protection of existing soil organic matter, and future increase in soil organic matter levels.

### Research Priorities

The top five soil health related research priorities for this group are:

- © Develop better tools and strategies for managing challenging soilborne pests.
- © Develop strategies to effectively use reduced tillage in organic production.
- © Develop metrics for measuring soil health (including carbon sequestration).
- © More research on cover crop combos and termination methods.
- © More information needed on managing common soil issues in western Washington: soil compaction, wet soils, soil pH.

- Tillage is minimized where applicable and is well-timed and strategic.
- General public understands and values soil health.

## Soil Health Issues

Description: Prioritized soil health issues.

- Soil pH.
- Soil tilth.
- Soil compaction.
- Nutrient cycling.
- Wind and water erosion of soils.
- Water-holding capacity.
- Soilborne plant diseases.
- Tillage requirements for certain crops limit that ability to reduce soil disturbance.
- Poor soil structure that results in drainage issues/flooding and limits field access.

## Milestones

Description: Specific metrics that gauge progress towards the above listed soil health goals.

### Short-Term (1 to 5 years)

- Establish a network of soil health research sites across the state that generate and disseminate soil health information.
- Identify management practices to increase soil water holding capacity.
- Increase landowner incentive programs by 30%.
- Increase knowledge of soil health by farmers, agricultural professionals, and the public.
- Hire three soil health-focused researchers for tree fruit, grapes, and Columbia Basin irrigated systems.
- Increase enrollment in incentive programs that pay landowners to utilize management practices that sequester carbon.
- Increase soil carbon levels.
- Reduce soil erosion rates.
- Position Washington as the preeminent state deploying soil health efforts and providing guidance to other states to follow suit.

### Medium-Term (5 to 10 years)

- Identify production system specific practices production system specific practices that build soil health on farms with degraded soils.
- Allow farmers and consultants to efficiently track soil health conditions through production system specific metrics.

### Long-Term (10 to 20 years)

- Rebuild soil organic matter levels to pre-tillage levels.
- Reduce soil erosion rates to represent pre-cultivation rates.
- Increase adoption of practices that suppress or provide resistance to soilborne diseases particularly in perennial production systems.
- Farmers can deploy targeted soil health practices to overcome problems based on production

systems specific metrics.

- Improve nutrient cycling.

## Information Gaps

Description: Gaps in soil health understanding and knowledge.

- Several respondents across focus areas noted the lack of a universal definition for soil health. Agencies such as the NRCS has provided a definition that is used widely. Either there is a lack of the awareness of this definition, or respondents that made this comment don't agree with it, or soil health metrics are perceived as a definition of soil health.
- Understanding of soil biology.
- Information to *translate* the current state of soil health knowledge to practical agronomic decisions.
- Understanding of soil health in overall ecosystem function.
- Relationship between soil health and food quality.
- Return on investment (ROI) of soil health practices.

## Barriers to Adoption of Soil Health Practices

Description: Barriers prevent the adoption of actions (e.g., management practices, policies) to protect or improve soil health.

- Soils are inherently complex.
- Lack of clarity and consistency of soil health sampling and metrics. Soil health metrics and expected measurement values vary across geography, production systems, and users.
- There is often a weak connection between soil health indicators and economic and environmental outcomes.
- Soil health-promoting practices can lead to unintended consequences (e.g., increased weed pressure and herbicide resistance).
- Producers do not have a good understanding of return on investment of deploying soil health practices.
- Lack of local technical support to deliver production system-specific recommendations.
- Producers are paid to produce crops not to undertake soil health practices, especially in commodity markets.
- Complex, time-consuming incentive programs.
- Complexity of crop rotations.
- Difficulty of investing in soil health practices for leased land.
- Costs associated with soil health practices.
- Logistics of using practices that improve soil health.
- Difficulty of incorporating soil health practices in perennial production systems.

## Overcoming the Barriers

Description: Actions (e.g., incentive programs, policy) that would help to overcome the previously

listed barriers to adoption.

- Financial incentives for soil health practices that appropriately cover costs.
- Stable, long-term research that connects economic and environmental benefits.
- Increased agency and University capacity and expertise in soil health.
- Implementation of soil health practices needs to be coupled with monitoring.
- Education efforts should simultaneously target K-12, College/University, and landowners and emphasize technical communication.

## Soil Health Policies

Description: Are there specific state policies that could increase adoption of management practices that improve soil health?

- Incentive programs that reduce the risk for farmer experimentation, provide direct payments for practices that are known to improve soil health, and are not complex or burdensome to farmers.
- Resources available for farmers to try soil health practices.
- Taxes on fertilizers, carbon, and soil erosion.

## Resources, Tools, and Opportunities

Description: Resources/tools/opportunities that could help advance soil health goals.

- Evaluation of soil health indicators across production systems.
- Coordination with other states and regions.
- Grant dollars from Federal, State, and commodity commissions.
- Technical support with expertise in soil health.

## Investment Areas

Description: Strategic investments (e.g., personnel capacity) that could improve soil health knowledge and/or adoption.

- Quantify the value of services provided by soil health improving practices (e.g., crop rotations, cover crops, amendments).
- University research and extension capacity in soil health.
- Funding for long-term experiments that evaluate soil health practices.
- Reliable, simple, universal soil health assessment tools.
- An effective tool to assess soil carbon at scale.
- Inclusion of socioeconomic aspects in soil health research.