Soil Quality Network Phone Interview - Summary

Of the 16 SQN phone interview participants, nine identified themselves as either working for an agency or as students. Four were either ag professionals or soil scientists and there was one each in the categories of farmer, researcher, and educator. The responses of these participants are summarized below.

Soil quality knowledge gained from SQN workshops

- **Regional awareness** - learned what growers/professionals are doing regionally for a better regional understanding, including:
  - Brendon Rockey, Rockey Farms – cover crop cocktails, nematode, crop rotation, biodiversity, microbiology.
  - Jeff Mitchell – University of California, Davis – comparison of Oregon to California
  - See and hear what people are doing, talk with SQN participants as well as presenters about what clients are doing. Applicable to W states.
  - Rick Fasching, NRCS - Climate change issues. Importance of C to soil health
  - Don Wysocki, Oregon State University Crop and Soil Science, Extension. Human impacts related to management
  - Greg Retallack – University of Oregon – history of Bk in profile; Mollisols cooled climate by C-sequestration
  - Hear challenges and solutions from other regions – application to PNW work
  - Benton SWCD Soil Quality Project

- **Knowledge of soil quality assessment techniques**
  - Wide range of methods to measure soil health including Graham Shepherd’s, Bioagrinomics, New Zealand, Visual Soil Assessment.
  - Use of Brix meter to include plant material in soil health assessment
  - Tools available for field work, demonstrations and research
  - Nick Andrews, Oregon State University, cover crop assessment that includes sample collection for biomass and nitrogen contribution and the cover crop calculator worksheet.
  - Andy Gallagher – soil classification and mapping
  - Penetrometer – root simulation; compaction
  - Ped size
  - How to collect a soil sample.
  - Infiltration

Since attending SQN, has the number of your work hours related to SQN changed?

**YES – 56% - nine responders**
- Coordination of NRCS Soil Health Initiative; not direct SQN result.
- Conference organization
- On-farm - seasonal; we actually have payroll category now to work on cover crops
- Seven (44%) had a 1-10 hour increase in their soil quality-related workload.
- Two increased workload 11-20 hours.

**NO (7) 44% - seven responders**
Have always dealt with soil quality in work.
Not as a direct result of SQN but work is more related to soil quality than prior to SQN.

Indicate the increase in your weekly work hours related to SQ.

Changes in soil quality work since SQN

- Inspiration for and excitement about field teaching and demonstrations and events with growers
- Partnerships and network development
- New knowledge and ideas - Use of knowledge, tools, activities and demonstrations to share with public; helped put projects into bigger perspective.
- Developed soil health education programs that align with public interest and priorities; show how farms provide ecosystem services.
- Increased confidence; to talk with individual farmers about soil structure on their farms; used concepts during cropping system diagnostic work.
- SQN shaped Oregon NRCS Soil Health work
- SQN 2014 – hosted by WSU and partnerships were critical
- Cover crops
  - Diverse cover crop mixes
  - Conservation cover (perennial) between blueberries, seeding grass
  - Pursued research project in SQ. would have changed techniques to include other types of assessment, e.g. VSA
  - Use of compost and cover crops to improve irrigation program
  - Implemented cover crops on large scale trials.
  - Started program with farmers to implement cover crops; providing cover crop incentives; working with OSU to provide technical assistance to understand nutrient contribution from cover crops for reduced fertilizer inputs.
- Expanded teaching content to include soil health and soil structure.
- Wrote journal article about soil health
- Obtained WSARE grant for cover crop trial in cherry orchards
- Did not change work but developed soil health support network
- It is fun and exciting to be around people interested in soil and make those connections.
- Inspiration to think about systems more deeply and decide upon focus to address local needs
- Shared soil health information with other students as OSU soil course TA and with student interns and farmers during Master’s research field and lab work
- As NRCS employee, share soil health information with NRCS state agronomists
- Offered cover crop incentive program to farmers
- Shared SQN knowledge during 4th annual Soil School offered in Portland area (100 attendees)
- Farmer has created new staff positions (20 hours/month) to deal with soil quality practices such as compost, bio stimulants, and fertigation with fish hydrolysate.
- Changes not related to work - use of worms and fish fertilizer in home garden

SQN knowledge shared: Half (50%) of interviewees had shared soil quality information in the week prior to the interview and the majority (81%) in the previous month.
Methods used to share soil quality knowledge with others:

- **Workshops** - 44% of phone interviewees have hosted or presented during soil quality workshops since SQN. Several described the work a continuation of pre-SQN work. Target audience descriptions included: Sauvie Island Winter Growers meeting, small gardeners up to large scale producers, dry and irrigated range/range land. Soil health knowledge was shared during the following workshops:
  - Soil School - West Multnomah Soil and Water Conservation District
  - Direct Seed Grower meetings in Jan/Feb – drumming up interest in cover crops
  - Soil health education has been incorporated into on-going programs, including: OSU Small Farms Conference, Growing Farms, Small Farms School, Soil School (West Multnomah SWCD), Extension pre harvest field tour June 4, 2014
  - OSU workshop for southern Oregon vineyard owners & managers. Promoted winter cover to add organic matter with an alternate-row tillage regime that includes low-growing grass and green manure tilled in spring; bare in summer; fall plant. continuation of NRCS program including RUSLE 2 and WEPS (wind erosion prediction system) trainings - tools highlight benefits of SQ rotations
  - The Risk Management Agency-funded project # 13-IE-53102-129 titled Reduce Agricultural Risk through Soil Health Education included (1) November 2013 Train the Trainer workshop – target audience of 16 included SWCD staff, agency, ag professionals and Extension staff, (2) support for a third Soil Quality Network workshop - SQN 2014, hosted by Washington State University at Mt. Vernon, Washington - 130 attendees included: majority of farmers, some ag professionals, state agronomists, Master Gardeners, biosolids professional, concerned citizens, farmers, and NRCS staff; speakers and students and (3) 22 soil health workshops to nearly 600 farmers and ag professionals and five courses reaching 200 high school and college students

- **Site visits:**
  - site visits with landowners provided opportunities to discuss soil biology and incorporate NRCS four basic soil health concepts
  - SQN provided information and knowledge to ponder relationships between pesticides, soil biology and compaction under blueberry planting sawdust. Knowledge was used to think through site preparation for tree planting in compacted area. The conversation included alternatives to ripping the soil, such as compost amendments that attract worms to biologically improve soil structure.

- **Tools** - Oregon NRCS has created valuable soil health education PowerPoint slides that discuss impact of partial or full implementation of 4 NRCS soil health concepts.

- **Future impacts:** Students who have become employed since SQN look forward to use of new knowledge in future work.

- **In reports to producers**
  - Soil health education tools are used in training field sessions.
  - Spoke at local grower meetings – “this year is cracking the box open on soils”
  - Telephone conversation 60% responses – yes. Those that say yes talk soil health on phone often

- **Social media** –
  - 1/3 don’t use social media; other 60% use following methods: Facebook, Twitter, Instagram, soil health articles in newsletters, joined SQN Map, soil health and compost workshop announcements, internal agency newsletters
  - Listservs - 10% have distributed soil quality information via listservs. For example, North Willamette Research and Extension Center listserv reaches multiple audiences, including PACSAC, the Portland Area CSA Coalition [http://www.portlandcsa.org/], NW Horticulture
Other methods of knowledge distribution

- National cover crop and soil health live stream. Can watch on SARE videos
- Conservation District newsletters – soil health articles
- Publications – see publication list
- Spoke to farmers in December 2013 at Washington Horticulture Society as Soil Organic Matter panel member.
- REACCH program demonstration, 2 field tours, articles in newsletters, fact sheet for SWCD including assistance in Soil health, one-on-one verbal, email to individuals - http://www.okanogancd.org/sites/default/files/publications/newsletters/March%202014%20web%20edition.pdf page 4 newsletter article (1800 addresses)

Financial or technical assistance provided to landowners related to soil quality.
Yes (7) directly (2) indirectly, including:

- NRCS Environmental Quality Incentive Program
- Technical assistance to farmers based on research data
- Publication – Technical Assistance
- Technical assistance shared through Extension Growing Farms course ($900 to $2700 is available to small farms to support their business needs; greenhouse, cooler; tractor) and farm business mgmt. workshop. Worked with SWCDs to provide scholarships for farmers to attend the Growing Farms course.
- yes lots, as part of BFR project he does soil samples for them, send into lab for analysis and reviews results with them as a part of the grant, has done the same with cover cropping (2x2 sample area) and demonstrating plant available N-
- Financial assistance indirectly via the sharing of information about Oregon NRCS EQIP and SWCD programs and Mercy Corps NW, which manages small business accounts -

Soil Quality Programs Developed

- Proposing new EQIP funding pool around water conservation. Soil health will help conserve water through WHC – use of conservation cover improves application ranking.
- Implementation of cover crops on dryland wheat fallow systems
- Short course on Soil Quality. Looking at all ATTRA SQ pubs to be more user-friendly and a more coherent curriculum, assessing what’s missing.

Farmer-to-farmer Information Sharing

- Christmas tree producers
- Two organic small farmers and one large acreage conventional grain seed farmer were on a soil health panel together. Despite the conventional farmer’s hesitation to be on panel with two organic farmers, this panel worked well and led to topics such as clover inoculation.
- During SQN 2014 two panels included farmers: 1) compost research with biosolids. Seed growers, concerned about disease, made up an interested contingent of the WSU audience.
- During soil and water conservation district board meetings – not directly related to SQN or continuing education.
- RMA Train-the-trainer – 3 farmers demonstrated farmer panels to future workshop facilitators.
- Experienced farmers teach a section of Growing Farms course.
- 28 RMA workshops with farmer presenters and field tours
• NW Horticulture Society – farmers as guest speakers provide agricultural compost use for production to fresh vegetable and berry farmers.
• WA Tilth workshops – organic farmers group – presentations include cover crops discussions
• December soil organic matter panel
• Growers meeting – organized by grower, conventional growers sharing about changing practices (40 attending).
• California Small Farms Conference – field tour and presentation from farmer at conference
• April 2014 California workshop – audience was 21 latino growers. Visited Almond orchard that had 6-7 species cover crop mixes. Farmer shared benefits and 6 new farmers signed up for consultation as result!

**Publications** – interviewees’ publications have been added to the SQN website.

**Soil Quality Research**

• Already doing compost trials but now have more confidence to discuss results of 10-year trial of cover crops in Christmas trees.
• Explored biological health of soil through relationships of Arbuscular Mycorrhizal Fungi (AMF) to soil quality parameters.
• Measurement of soil infiltration rate and N-mineralization test on-farm trials
• **Western SARE Farmer/Rancher Grant:** FW14-019, “Improving Orchard Floor Management through Multi-Species Cover Crop Mixes,” Principal Investigator: Mike Omeg, Oregon; $18,340. Summary: “Planting cover crops in the alleyways could increase the sustainability of tree fruit orchards, but this practice is not utilized at all in the Columbia Gorge region, according to the local Oregon State University Extension office. This project has three primary objectives: 1) to research and quantify some of the key benefits of multi-species cover crop mixes in orchard systems, 2) identify the best seed mixes for the region’s soils and climate, and 3) demonstrate management techniques that orchardists in the region can use to effectively incorporate cover crops into their operations. If the project’s cover cropping results are positive, this should lead to increased adoption of this practice by orchardists in the region and increased sustainability of this cropping system. The project team expects to see cover cropping benefits in reducing soil compaction rates and increasing tree nutrient uptake, fruit size and fruit quality, among others. Education and outreach will include two field days (pre- and post-harvest), a cover crop in orchards “How-To” guide that will be distributed for free to orchardists in the region, articles in trade publications and sharing the research results via social media outlets.
• Organic fertilizer in corn production; investigating the mechanisms that cause soil water repellency
• Oregon Department of Agriculture Fertilizer Research Grant – Environmental Protection Agency Lysimeter Study includes soil quality assessments.
• Application for NRCS CIG – for on-farm demonstrations, planting 10-40 acres in cover crop over 3 years. Tracking moisture, soil biology activity and active carbon.
• Several interviewees mentioned partnering with Oregon State University researchers
• Pre-proposal for cover crop trials 2015-2017 on dry land production.

**Contacts you’ve made as a result of SQN**

• Farmers
• Brendon Rockey and Woody Thorpe; a beet seed farmer who attended SQN 2014, typically not known as quick to change, is excited about compost and building soil quality.
• Farmers who have been presenters in subsequent workshops.
• Cover crop seed suppliers - at May 2013 SH workshop funded by ODA Fertilizer Research grant (Benton SWCD).
• Provided technical assistance to vineyard managers and hazelnut producers.

• **Professionals**
  - Strengthening of current relationships as opposed to new contacts.
  - Since SQN 2012, worked with Owens; Matteson; Cassidy; Mitchell; Shepherd, Andrews
  - SWCD internship and research opportunities
  - NRCS advising on SARE project; NRCS financial assistance
  - As a SQN presenter, interacted with ag professional audience

• **Students**
  - One student volunteered for NRCS and created soil health education tools.
  - All participants, including students, who attended SQN 2014 received book - *Building Soils for Better Crops*
  - A student met Caitlin Price Youngquist, PhD candidate and student researcher, who collaborated with the Conservation District in her area. After meeting her, he declared his major in Soil Science!
  - Student’s dad is a soil scientist, who did graduate work with Dr. Larry Boersma, Oregon State University. Dad’s research was around Bend – hydrophobicity of cinderytypic cryorthents. 😊 and the use of prescribed burns to reduce tinder load. Student now enjoys talks with dad!
  - Students enjoyed the poster session, learning about research and conversations
  - One participant has been invited to be guest lecturer in following classes:
    - Cassidy’s OSU Organic Farming and Gardening class HORT 260
    - Willamette University
    - Linn Benton Community College
    - Reed College
    - Clackamas Community College
    - Now includes Soil Health concepts in Cover Crop lectures
  - During SQN workshops, informal meetings of OSU students facilitated discussions of real world implementations
  - Chemekata Community College soils class, soil morphology primer and met OSU intern

• **Coworkers and work collaborators**
  - Teresa Matteson & Natalie Allen
  - Lindsey du Toit, WSU researcher, seed pathologist. She is new faculty at WSU and plans to work with soils and will have workshops.
  - Farmer has horticulturalist who will work on SARE grant; Hispanic field crew quite crew thrilled with size of tillage radish.
  - Discusses soil health all the time; works with Benton SWCD on soil quality project; another soil health cohort is Tom Thompson (soil scientist)

• **Researchers**
  - Professors about sponsoring Master’s project
• Worked with Lynn Long, Wasco County Extension to invite David Granatstein, WSU, to present about soil quality at morning orchard managers meeting - 30-40 local orchardists.
• other researchers (dairy waste mgmt. and crop production)

• **Program Coordinators**
  • Held a Conservation District workshop in May 2014; Washington NRCS is doing a little Soil Health education.
  • NRCS funds are from state case studies EQIP practices for soil quality; expanded cover crop work; Beau Sorensen – NRCS District Conservationist.

• **Other**
  • Don Wysocki spoke at SQN 2012 then at Baker
  • “The guy with the hat” James Cassidy, OSU Soil Science instructor
  • Renewed acquaintance with SQ researcher, Cover Crop contact. SQN 2012 provided the opportunity to get the word out about ATTRA soil health publications and programs.
  • Soil consultants and connected with publications, specifically the Visual Soil Assessment book
  • SQN has provided multiple opportunities to share cover crop calculator information to a variety of audiences.

**Key soil quality topics in conversations since attending SQN.**
• Basic soil quality (75%) – including: Bulk density, Organic matter, compaction, infiltration, biological activity, water holding capacity; drainage, erosion prevention
• Soil quality assessments (88%) – including soil testing, soil degradation and degree of degradation,
• Cover crops (81%)
• Crop rotation (50%)
• Organic amendments (81%)
• Reduce soil disturbance (81%). Found a conflict with NRCS about tillage recommendations. Disagreement: NRCS takes text book approach, basin team leader, soil scientist, cover crops, suggest there should be no tillage what so ever. This interviewee thinks that shallow tillage every 2 years may be benefit. We need soil health answers for perennial systems.
• Cover crop calculator (56%) – one interviewee put together spreadsheet for nutrient management so you could enter previous crop, this year’s crop, soil assessments, and other info – look up table with OSU recommendation for crop, a hybridized planning worksheet with cover crop calculator and soil nutrient management worksheets.

• **Other topics** –
  • Water quality and quantity; soil health relationship to water quality
  • Plant health and disease suppression
  • Oregon issues – slugs; Oregon NRCS Soil Health committee outreach strategy and message; right approach is important!
  • Conversations with coworkers – research farm manager and faculty – interest to improve Soil Health on research farm.
  • working with farmers to invest in their soil as soil is the capital equipment of the farm
  • Teaching people how to use RUSLE 2 via phone calls with state agronomists. Wyoming this month (April 2014) RUSLE 2 training.
Soil Quality on-the-ground or field work you’ve been involved with or heard about since SQN.

- NRCS people implementing Conservation Implementation Strategies to get practices on ground. Oregon Counties: Wasco and Hood River Counties - CIS about soil health, orchard
- Grant County – CIS on rehabilitation of abandoned crop (no water) weed patches,
- Benton Linn Lane Lincoln, indirectly draws on SH concepts
- Linn Larsen (Baker County) CIS for irrigation = cover crop, reduced tillage.
- Mixed grasses in berries fall 2013
- On farm trials – beet seed growers – 1 grower; 1 rate of compost; 25 applications. Field research – biosolids compost; soil parameters, fertility, crop yield. Field assessments.
- OSU Research involves farm field soil collection and assessment. Farmers receive report that encourages informed management decisions to sustain or improve soil function.
- Okanogan SWCD’s (Leslie’s) cover crop grant; conservation district program rents no-till drill to farmers to encourage reduced disturbance.
- Has been previously been involved in field observations with farmers to see how practices impact soil health – now has confidence to discuss impacts with farmers.
- Regularly samples cover crops for N levels on cover crop demo plots and on farms with farmers.
- Phone conversations about on-the-ground work.
- Work with Nick Andrews related to cover crops and soil testing throughout the year. Taking soil tests for small farms, advising on cover crop mixes and how to plant, and cover crop on the ground analysis – total biomass.
- In Hermiston discussed with grower management practices to encourage infiltration. Crop rotation was 3-yrs alfalfa then 2-yrs blue grass, tilled for corn crop…tilled wet with large amount of dairy manure.
- Working with growers on grant proposal to determine which practices are necessary……for grant proposal demonstration plots and farm visits for workshops

Opportunities for farmers to implement soil-building practices:

- On farm trials.
- Conversations with farmers but no technical or financial follow up.
- Organic EQIP use has increased through SWCDs; has been involved in management planning for organic farms; Professional Development Program grant with Oregon Tilth/NRCS.
- NRCS staff learned about how to direct farmers to specific practices.
- Cover crop incentive program and NRCS soil health initiative with incentives
- Increase in awareness with Direct Seed grower meeting, Spokane SWCD has direct seed equipment and more interest locally with education happening at the Direct Seed grower meetings.
- Sustainable soil management @ Soil Born Farms, CA SFC SQ sessions, radio programs, webinars, workshops and trainings (at least a half dozen on SQ)
- 5,000 acres – lobbying for cover crops to be covered under crop insurance program – a 15-year process.

Barriers/challenges to outreach efforts or on-the-ground implementation:

- Slugs and voles are Willamette Valley barrier to reduced soil disturbance.
- Risk Management Agency - crop insurance is limited one crop every two years therefore farmers are reluctance to consider cover crop use because they will lose insurance.
- Columbia River basin uses summer fallow to save moisture, all dry land;
- There needs to be a national conversation.
• What is NRCS role and how to interface with RMA? Regional perspective.
• Time.
• Development of Technical tools.
• Program finance system requires work within a defined structure. Soil Health must be built into the way they do business and disperse money.
• We don’t have established set of metrics that lead to practices. Soil chemistry tests tell the farmer that she does not need P, but there is not a matric that tells the farmer that she needs a specific cover crop mix.
• Grain and seed farmers rely too much on soil disturbance especially perennial rye grass, weed control, band active charcoal over seed; herbicide kills between bands of charcoal. No weeds around rye grass. Pulverize soil and no residue to use charcoal. Work heavily in fall. Significant erosion. And, with all grains – slugs are killed by tillage.
• Small organic farms – apply compost usually not expensive. Put too much on – total P and K too high. These farmers should use less compost or have alternatives to compost use. They have the idea that compost and organic matter is good; more is better. They apply thick 3-inch compost mulch for weed control which adds P and K to soil.
• Climate; ground stays wet; heavy clay; late harvest in fall; declining organic matter; cost
• Compost – cost and time
• Potatoes 3-year rotation; some seed crops have 15-year crop cycle - diversity of crops require long rotation.
• Rental land – low incentive to build soil quality; Land owner-managers more likely to practice soil building on property they own but not on leased land.
• Different perspectives on farming. Conventional growers may have barrier; Big and busy farmers don’t have time.
• No-till drill is large; difficult to move;
• Lack of support from employers (supervisor).
• Lack of information.
• Farmers like to wait for someone else to try practices. Lack of research. Farmers will act only on practices that have sufficient information, so lack of data prevents support. Inertia – growers have confidence in the way they’ve done things. It is difficult to get them to adopt change. Hesitant to try new things, what they did before seems to work; Cultural ‘this is the way I do and the way my dad did it’.....scared to try different because it seems that what you are doing is working
• Profitability is a barrier.
• Depends on grower’s need to change. Has worked with a farmer who could tell that his management was not working so that farmer was determined to find different strategy and change.
• Willamette Valley farmer tried cover crops in 1990’s and had problems related to weather and management challenges in spring.
• Estimation of Nitrogen and cover crop management.
• Sauvie Island, Oregon – farmers don’t appreciate cover crop management in vegetable systems. Biomass management can be a barrier. One farmer planted crop one day after incorporation of cover crop. There was inadequate time for decomposition and he lost the crop.
• Timing, in various seasons it can be difficult to get cover crop established and incorporated. Relay seeding helps.
• For Farmers, the barriers are time and money. Integrating cover crops into a cropping system requires planning a year ahead. Allow timely planting and termination.
• Organic amendments: costly, deciding what portion of budget can be used that may not buy you instant results but will build future soil quality. NRCS programs can soften the financial burden.
• We have a real challenge with lack of knowledge in orchard systems. Cover Crop research has been
done in field crops where no shade and tree competition are considered. These considerations are
fundamental to orchards and will affect the implementation strategy and benefits gained.
• There are too few people promoting soil health. Get the SSSA “highlings” to CPSS/NRCS camp.
• Farmer time – this will change if good approaches to soil health management are showcased.
• Funding and understanding the needs of the farmers and how to take what they need and figure out
a practice that can address it.
• Depends on group – ignorance about how soils function.
• Access to implements, specifically a manure spreader.
• Funding and micro-scale translation for small farmers

Strategies to overcome the barriers:
• Have not overcome barriers.
• Outreach not problem – farmers are interested in this.
• May 7, 2014 in Salem, Oregon - huge slug pow wow
• Get Oregon State University, Natural Resources Conservation Service (NRCS) and farmers in one
room.
• Use a spreadsheet with the OSU cover crop calculator that shows Phosphorus and Potassium values
and defines other ways to get Nitrogen.
• NRCS work with grain and seed farmers on slug plot trials - work in progress
• Seed growers concerned about disease are interested in soil health.
• 20 – 50% yield boost by adding compost.
• On-farm trials get attention - fast economic benefits.
• Identify field, crops and practices that get quick attention and benefit. Flashy Soil Quality
improvements.
• During a conference field trip (not SQN) I talked with a large-acreage, busy farmer about
involvement in my research who agreed to participate!
• RUSLE 2 and WEPS – encourage farmers to use the models to answer questions. No specific
complications; the answers are what you expect.
• Encourage farmer-to-farmer sharing of experiences; anecdotal stories in same neighborhood are
respected. Anecdotes that are consistent with research provide validity. Farmer name dropping by
Extension staff helps with competitors’ adoption of practices.
• Beginning farmers – when taught from scratch, they can be more receptive and willing to change.
They do not have the generational inertia that long-time farmers carry.
• Washington State University work has helped. Seeing more use of Cover Crops and reduced tillage
with varied success. Some spectacular and others flop. Example, community garden next to house,
has adopted cover crop practices in garden beds. Hand broadcasted crimson clover in tomatoes and
collards last fall. Planted garlic into young crimson clover. Hand clipped. Results pending.
• There is always a need for soil health education. Farmers don’t know enough about soil!!!
• Create good relationships with farmers and they will share with you and trust you. Then work
closely with them to apply for grants.
• Keep informing and working with new farmers.
• Few people have tried to work with minority farmers about what’s happening in the soil food web.
• Land grants teach about nutrient management and pesticides but don’t talk about the basic of soil
function.
• Going in with neighbors to get manure spreader.
• Education to overcome cultural barriers by talking to ag professionals and extension agents
• Biology is important and farmers want to make it better.

Soil quality resources and tools that you have used since attending a SQN event:

**online resources**
• NRCS website (3); NRCS soil health website - PowerPoint by Haney on Solvita and other stuff (ARS) NRCS funding to pay for multi-parameter analysis for Soil Health focus on biology. Solvita is one; NRCS soil health theater; used Ray Archaletta videos for Oregon High School biology teachers and NR teachers to teach the environmental impact of soil degradation.
• BSWCD assessment webpage
• OSU Small Farms, OSU and WSU pubs.
• publication, e-book, WSARE cover crop book, NRCS SQ test kit
• Web Soil Survey; inherent properties of soil is basis for soil quality work
• OSU Cover Crop Calculator (2), UC cover crop database, Nebraska cover crop mix calculator – gives aspects of cc qualities of each species includes cost and seeding rate, categorized, organic cover crop and fertilizer calculators

**field tools**
• All Oregon NRCS field offices now have infiltration rings, pH meter, Solvita bags to send in for solvita test, ag stability, and she now has RMA rainfall simulator. Held at Keiser, NRCS soil health training, July 2013.
• Solvita test
• Use of previously known tools, such as infiltration, for workshop demonstrations (2)
• RMA Soil Health Education and Rainfall Simulator kits (2)
• Compaction tester, Penetrometer – doing work with quantifying effects of SQ amendments.
• Infiltrometer (2), aggregate stability
• Purchased all kinds of equipment including: Kuhn knight manure spreader; spader for reduced tillage, Europena low compaction seeder – no-till drill; penetrometer
• assessments
• cover crop calculator
• Graham Shepherd’s Visual Soil Assessment (2)
• Willamette Valley SQ Card

**other**
• professor’s comment – if people want to do something with soil in next year or decade, they need to consider what has happened in the past.

**Agency and University resources**
• NRCS resources
• WSU extension
• USDA ARS, SARE book - *Building Soil for Better Crops*
• Crop rotations on organic farms
• Cornell Soil health training manual
• Ohio State University has biology of soil compaction
• Assessing soil quality on organic farms

What other resources have you discovered in this process?
• NRCS bulletins
• ATTRA resources
What resources are missing?

- Journal articles for literature review – Master’s thesis
- Extension bulletins
- Compost bulletins – WSU soil management for home gardeners; soil mgmt. for small farms; use manure calibration rates method. D. Collins improved reduced tillage for organic producers.
- Popular Press articles for general public – soil bacteria – human health
- Found manure denitrification and decomposition model that she is using for her research
- Cornell and other universities’ websites
- Washington State University has number of tools; weather data (ET info) for water efficiency; Extension no-till pubs very helpful.
- Ray Archuleta videos (NRCS)
- Andy Bary compost calculator
- Cover crop system use of common rye as grain cover. Aroostook County, Maine has a rye with advantages. Aroostook rye is expensive and not yet available on west coast. Common vetch – from Oregon has been used in Washington plots with good results.

How have you shared these resources with others?

- All the time.
- In demonstrations.
- Gave to farmers or other researchers
- Shared with farmer and during ag energy audit.
- Research – not shared; paper in review RAFS – renewable ag food systems. Doug extension bulletin. Reduced tillage
- Links in mailing, distributed at workshops, putting them in her thesis, and shared manure model with other colleagues and discussed how it can be used in life cycle assessments to measure environmental impact

What resources are missing?

- There is a void in human resources. To address this, the Oregon NRCS website will have Faces of Soil Health in Oregon, to showcase not just producers but other agencies, extension workers, etc., to recognize people across the state.
- Soil health has to do with biology. There needs to be a good biology test on soils that lead to definitive recommendations for changes in management.
- Relative comparisons between two management systems using tools such as infiltration.
- Define tools that are helpful for soil health professional on SWCD level. The RMA project developed kits and provided tools that need information about the use of tools with interpretation and printed resources. Use the tools in different soil textures – clay vs sand – to show how results change.
- Economics of soil health.
- More research papers, for example, Cornell’s assessment development papers/document.
- Research papers are often behind pay wall and inaccessible without payment.
- Practices supported by research data
- Reduced tillage – how feasible is it?
- Make Soil Health a safe, comfortable place to talk about your work.
- Evaluate economic benefits of soil health; easier to do with nutrients and physical characteristics; how does a grower decide “is it worth it?” Weigh costs vs. yield;
What needs must be met in SQN future?

- Workshops
- Gather partners in same room.
- Keep information fresh.
- Expand on West Coast.
- Sort out testing protocols so we get established limited set of tests for soil biology.
- Build on people pool. Recruitment of soil health educators in SWCDs, NRCS and other professions working with land managers.
- Get tools to people – basic tools and regional training.
- Connection with growers; Continue incorporation of conversations with growers;
- Economics are big piece – how to quantify and connect science and technical with economics.
- Continue the network between professionals with different specialties.
- How many growers have attended workshop; 95% of attendees are agency folks (NRCS or CDs). More farmers attending will be better. All we talk about will be useful for farmers.
- It is intimidating to talk with farmers. Have workshop about how to talk with farmers. Talk about farmers’ concerns about talking with agency, how to get beyond that, and what farmers want to hear, instead of what we want to tell them. Experience is that farmers are curious when concepts are information and incentivized and not mandates.
- Washington State University no-till trials use <25 acre plots for demonstration - that is a good model.
- Help home owners understand the environmental conditions of their property via education about soil properties, Web Soil Survey. Provide related resources to public.
- From the environment consultant perspective – concerns about soil contamination and how contaminants interact with soil texture. Engineering use of soil stability.
- Continue building relationships amongst people with peripheral interest. Continue to build network.
- Enhance the capacity for more teachers; provide ways for instructors to share slides such as a cloud library of teaching slides; share resources. Host online spaces for sharing works in progress.
- On-farm implementation projects – track cover crop acreage for national goal. Set targets, e.g. 20M acres of cover crops by 2020. National Cover Crop Conference...Howard Buffett and son...get SQN on board with this movement. Join the National leadership committee to digest suggestions and get the plan implemented.
- Have a core group of people who are passionate about carrying soil health education forward.
- Look at climate change context 1) If we can effectively sequester carbon, take carbon out of atmosphere. What is potential? 2) use of soil quality as adaptation tool; hotter temperatures with varied precipitation vs drying climates.
• More field days in more diverse cropping systems. Demonstration trials by local NRCS and SWCD cooperatively with farmers to try and demonstrate soil health practices. Farmers gain inspiration from neighbors. Can SWCDs provide match for grant work.
• Have more events and get more growers thinking about how to incorporate the ideas behind soil quality into their practices.
• Spread the message and get more implementation and resources for people coordinating these efforts, have access to SQ research.
• A group of landowners excited about SQ and making changes on their farm….attending conferences, but need more in-depth learning opportunities, perhaps intensive full-day workshops on “why organic matter is good”
• Funding for SQN conferences and the face-to-face info exchange.
• Encourage backyard gardeners to not over fertilize, more simple soil tests for these folk and advising them on how much they really need.

Describe future SQN building blocks that you envision.
• Conversations
• Research models
• On-ground demonstrations on-farm
• Workshops for farmers
• Professional workshops about working with farmers
• Pick up reins and carry on. Identify people to carry on.
• Core group of people; 2015 UC Davis new; CALCAN Cal climate network audience.
• Being a network connecting all involved with soil quality
• Building excitement about SQ and making it exciting, getting farmers involved that are excited about the benefits they are seeing from building SQ...contagious!
• Crop rotations promotes different soil microbial populations – sharing articles like this on listserv
• Soil quality manual or template that can then be adapted to soil associations.
• Infest public libraries with books and stories about Soil Quality for kids.

Describe actionable objectives for future SQN work:

<table>
<thead>
<tr>
<th>Continue annual SQN meetings</th>
<th>Continue website</th>
<th>Find grant writers for E&amp;O efforts</th>
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<tbody>
<tr>
<td>Establish set of tests for soil biology</td>
<td>Identify soil challenges</td>
<td>Provide tool kits to work with people</td>
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<tr>
<td>Cover crop and compost demonstrations with benefits</td>
<td>Host soil quality field days</td>
<td>Start conversations</td>
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<tr>
<td>Accumulate SQP data base of 200 samples for WV</td>
<td>More than one SQP workshop/year at local level to 1) professionals and 2) farmers</td>
<td>Build a network of professionals to work with one grower including water, soil, and other resources that are all important.</td>
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<tr>
<td>Train professionals in methods for interaction with farmers</td>
<td>Provide outreach materials specifically for farmers</td>
<td>Encourage on-ground cover crop demonstrations</td>
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<tr>
<td>Track Cover crop acreage</td>
<td>Track number of Soil Health related EQIP contracts</td>
<td>Track # of people introduced to soil health, e.g. 70 attending soil school last week</td>
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<tr>
<td>Set goals (25) and track the number of growing [soil health]</td>
<td>Host soil health sessions at Small Farms Conference</td>
<td>Track farmers’ intention to change – evaluations; ask intent to implement</td>
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<td>farms/year</td>
<td>practices...</td>
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<tr>
<td>Build on cover crop research and education in organic and conventional systems.</td>
<td>Refine the message of soil quality.</td>
<td>Get the latest research to the people working on the ground</td>
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<td>Provide connections between all parties involved in SQ</td>
<td>Identify successful approaches to soil-building to get farmers with poor soil quality practices to pay attention to their soil</td>
<td>Teach techniques that would help support the soil quality effort</td>
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<tr>
<td>Soil quality outreach with gardeners; development of simple take home test kit for nitrogen</td>
<td>Obtain funding</td>
<td>Bridge gap between soil health and research that is peer reviewed. Talk with those researchers – what does soil health mean in physical, chemical and biologically terms?</td>
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</tbody>
</table>

**Please identify future funding needs or opportunities that will help sustain the SQN.**
Partner with universities; small farms – 2016 whole SQN –

- Very interested in food quality or flavor with soil quality. Drill down to what makes food taste the way it does. Big money in nutrition. Specialty crops and varieties for picking up flavor differences –
- Food soil connection. Food money connecting to soil.
- Funds from Washington State Conservation Commission. Soil quality demonstration plots for will show the need for more funding.
- Fund event in county to encourage soil quality.
- NRCS event – hardly any growers…although emailed all growers in program invited.
- Implementation of Soil Health practices in commercial rotations.
- Use of cover crops, change rotation, amendments.
- Provide one-on-one support for farmers.
- Link in with Sustainable Agriculture Research and Education, National Institute of Food and Agriculture (Beginning Farmer and Rancher Development Program) and US Department of Agriculture to make the point that soil quality needs to be a research priority, for example cover crops
- SARE; used application for recent training
- Private donations; Coffee with Bill and Melinda Gates
- Membership fee
- Funding for statewide meeting
- Grocery stores and big food companies as funders. Find one big sponsor, like Quaker Oats or General Mills.

**Are you Interested in future SQN events?**
- Host many small workshops - include SQ information routinely in many workshops – MONTHLY!!!
- Weekly in winter!!!
- Grant to fund Farmer-focused events – workshops for farmers – can be done on local level and farmer conferences.
- Audiences must include producers and professionals
Where should future SQN events be held?
Various producing regions; NE, gorge and WV

We often deal with soil quality on soils as a whole but I think it increases the relevancy of our message if we deal with more site specific issues and towards that I think it would be interesting to look at the major soil groupings (example Willamette terraces, floodplain, Volcanic Foothills etc) and deal with issues specific to particular soils in any particular SQN event.

SQN Website:
Have you visited the SQN website?
75% (12) of the interviewees had visited the SQN website. Responses include: probably, OSSS link request, once and just now.
(4) NO
Was it helpful?
Yes (4) workshop related visit, brief visit, need time to go through it
No (1) and (1) don’t remember

Q. 40 Was it easy to navigate?
• Yes (4) – have not used extensively
• Maybe (1)
• Didn’t find much on it, extension pubs; small farms connection,
• Been a while

What components, links and tools would you like to see posted on the SQN Website?
• People photos
• Fresh content - what happened this month in SQN!
• Clearing house for soil resources.
• Videos for using different tools – infiltration, compaction, Compile best videos. Where are the videos that already exist?
• NRCS links
• Slide share cloud
• Dropbox for publications in progress – down load capacity.
• PowerPoint format for example; e.g. facilitate the ability to take spreadsheet to farmer location w/o internet.
• Online manual for soil quality
• K-12 School resources
• Upcoming workshops – also use workshops as a way to promote SQN
• Cover crop calculator

What will make the website/listserv more useful?
31% of interviewees knew they were subscribed to the SQN listserv.
• Degree day calculator
• Listserv reminders
• Milestone announcements
• Reminder of what resources are there
• Other society websites: Oregon Society of Soil Scientists, Soil and Water Conservation Society, Oregon Branch
• Shotgun information with varied interest for audience
• Potential for tons of resources and events
• Updates, workshops, events and speakers
• Publications
• Innovative projects or programs, examples of soil quality work on the ground
• Quarterly project spotlight
• New soil quality initiatives through NRCS
• Grants
• New journal articles
• Problems others are having.
• Ask a soil scientist questions.
• Tools
• Q and A

SQN Database
Originally the SQN database was intended to build on a previous project, the NRCS Conservation Innovation Grant-funded Soil Quality Project, to generate soil assessment reports for farmers. SQN 2012 workshop questionnaires indicated a strong need for a resource that would provide information about on-the-ground soil quality work. Throughout the 3-year SQN project, agricultural professionals repeatedly stressed the need for access to on-the-ground soil quality work, especially farmers’ soil building practices. Revisiting the proposal logic model’s short, medium and long term outcomes, Amy suggested a database of soil quality work linked to a global map. Viewers click map pins to see contacts, programs, research and events in specific locations.

The purpose of the map is to increase the capacity for the global audience to access SQ resources, such as research, on-the-ground successes, and lessons learned. During SQN 2013, we introduced the concept of an interactive database linked to an online map with an enthusiastic response from the audience. The SQN Map went live May 2014 as a low tech prototype. With adequate funding, a future version has signficate potential to serve information sharing needs and showcase people performing soil quality work in these categories:
  • Assessments – Field / Laboratory
  • Assistance – Technical / Financial
  • Consulting
  • Education
  • Event Coordination
  • Farm/Ranch
  • Research
  • Urban
  • Other: Forestry, Watershed restoration, Advocacy, Landowner, etc.

Have you visited the SQN Map? 25% interviewees had visited the map because they were inspired by the interview appointment, had received an email from SQN Team and to see if they were on the map.
The current data collection and mapping process is slowing evolving as we work out the glitches. The prototype collects data through a survey. After data conversion and validation the points are uploaded to the map. This slow is frustrating to participants. Some people are not sure how to answer questions, for example when their work supports but is not direct technical and financial assistance to farmers.

Map improvement comments are:

- Contact Howard Buffett, who supports cover crops and soil health programs, for fund upgrade.
- Add contacts by zip code instead of only by lat/long.
- Make map identifiers more concise, hyperlink website links on map.
- Need more info about what SQN Map is for with simple directions; what does the map actually provide? Include description. Why get on the map?
- Have farmer try to retrieve information from the SQN Map.

**Interviewees suggested the following ways to increase map visits:**

- Listserv emails about map updates, especially milestones – 200 points on map
- SQN Map workshop sessions
- Publicize SQN Map during workshops
- Promote the map as a travel tool to locate soil quality activities at destination.

**The following email is sent to SQN Map participants:**

Welcome to the Soil Quality Network!
Thanks for your contribution to the world-wide SQN map. By highlighting examples of SQ work, others will be informed and inspired to develop a program, host a workshop or plant a cover crop.

The next step – invite three other people to contribute their soil quality work to the map.
The more points on the map, the stronger the network.
Build a future with healthy soils!

**Phone Interviews - In closing:**

At first, sixteen phone interviews was a daunting undertaking. In reality, the process was comfortable and informative. We are grateful to the participants who each invested from 45 minutes to nearly 2 hours in provided SQN feedback. It was obvious that they valued the project through their preparedness and comprehensive responses. Sincere thanks to all!