Data Collection, Characterization, Monitoring

Charge from Groundwater Management Area Advisory Committee

Working Group Members

Melanie Redding (Chair); Andres Cervantes; Bob Stevens; Charles (Pony) Ellingson; David Bowen; Chelsea Durfey; Dave Cowan; Doug Simpson; Elizabeth Sanchey; Frank Lyall; Ginny Stern; Jaclyn Hancock; Jan Whitefoot; Jean Mendoza, John Van Wingerden; Laurie Crowe; Lino Guerra; Mike Shuttleworth; Ralph Fisher; Ron Cowin; Scott Stephen; Steve Swope; Stuart Turner; Dr. Troy Peters

Meetings/Calls Dates

Meeting: Thursday, March 29, 2018, 1:00-3:00 PM
Call Number: 509-574-2353 pin: 2353#

Participants

Present: Melanie Redding (Chair), Vern Redifer, Jean Mendoza, Steve George, David Bowen, Ginny Stern, Stuart Turner, Andy Cervantes, Gary Bahr*, Chris Saunders, Star Betancourth (Yakima County support staff)

Key Discussion Points

The meeting convened at 1:00pm. After the customary introductions, Jean Mendoza presented via PowerPoint a document labeled "Analysis of Lower Yakima Valley Groundwater Management Area Deep Soil Sampling".

Deep Soil Sampling Analysis & Discussion:

Jean began by setting the stage. When the deep soil sampling began, the group had a lot of ideas for how the data could be used, and was hoping for a statistically valid representation of fields.

Slides 2 and 3 of the analysis contained the following conclusions:

- There are differences between spring and fall deep soil testing results
- There was unequal coverage of the various combinations of irrigation practices, crop types and leaching factors. (See Attachment 2)

  o Data was gathered for 15 out of 27 categories.

  o Only 7 categories had six or more samples
  o One category had 3 samples
  o Two categories had 2 samples
  o Five categories had only one sample.

- Sixty five of 175 samples or 37% fell into the category of sprinkler irrigation, 2.5 ft to 4 ft crops and moderately high to high Ksat
- There were fields with extreme values that would ideally be re-tested. Those fields are #'s 3141, 2044, 2047, 4152, 3117, and 3119.
- The two asparagus samples, #'s 4175 and 4176 may not be representative of that crop
- The range of values for alfalfa is huge and suggests a need for further study
- The range of values for hops is large and suggests a need for further study
- Over half of the fields planted in triticale are at medium to high risk for leaching nitrate to the groundwater
- Double cropping is associated with higher nitrate levels
- In this data set rill irrigation is more protective of the groundwater than sprinkler irrigation
- Application of liquid manure is significantly more likely to result in high nitrate levels
- There is more soil testing on fields with higher nitrate levels.
- There are wide ranges in values for many of the crops in this data set.
- Some of the project purposes were not achieved in this round of DSS.
- Baseline data for many of the crops and conditions is still lacking. However there is adequate information to proceed with recommendations regarding triticale and application of liquid manure.

Discussion ensued on some of the limitations of the data, and what they suggested for future areas of study. Outlier results should be tested again in the future, with the permission of the owner, to see how the outcomes compare. Slide 9 described how crop history was provided for the past four to five years in most fields, and how fields which had been planted with multiple crops made it difficult to assess how much the current crop being grown there was contributing to nitrate levels.

Slide 10 contained a table outlining the percentages of crops in the deep soil sampling. Triticale had contributed 22 percent of the fall samples and 46 percent of the spring samples, although triticale amounted to only one percent of the fields in the Lower Valley, according to the WSDA's 2005 survey. A more recent survey by WSDA had put the estimated acreage for triticale at 10,780. Slide 19 contained work plan estimates of irrigation practices compared with what the study did, and found that 74 percent of fields sampled used sprinkler irrigation compared to 63 percent in the original work plan. Rill irrigation came in at 19 percent, compared to 16 percent in the work plan. Slide 23 contained a table with numbers from each sampling category, broken down by irrigation method and crop type. Slides 24-28 contained graphs illustrating the data. Rill irrigation showed low nitrate levels below the 1-foot level on the sites sampled, while sprinkler

irrigation showed higher levels at the 2-4-foot depth. Drip irrigation showed high nitrate levels for crops with a 4-ft root depth like alfalfa, hops and fruit at the first two feet, and then declined sharply afterwards. Based on the number of samples available, certain groups of data lent themselves to limited analysis, such as alfalfa, triticale and corn silage, double-cropping, fertilizer practices, and root depth.

Slide 30 contained suggested goals for end-of-harvest soil testing at the 2-foot level in Eastern Washington based off of the Department of Ecology's CAFO permit, which described 55 pounds per-acre as "low-risk", and above 110 pounds-per-acre as "high-risk". Slides 33-52 contained graphs illustrating nitrate levels at one-foot intervals going down to six feet, broken down by irrigation method, crop type, fertilizer type, and season. There were 60 slides in Jean's presentation. In the interests of time, she stopped at slide 44.

Members discussed how best to utilize the data Jean had brought forward. Ginny expressed concern about using average numbers given the diversity of results within the samples, and offered that perhaps expressing the values in mode and median terms would be more useful. Vern stated that the main reason the deep soil sampling efforts had fallen short in obtaining people to volunteer their fields was a lack of incentive. A future sampling program would probably need to offer some amount of monetary incentive to participate. Group members would have to give further thought to what might be reasonable to ask in return for that incentive. One group member thought it might be worthwhile to roll any incentives into the Voluntary Stewardship Program.

Some members expressed a willingness to present an analysis of the deep soil sampling results at horticulture and grape grower trade shows, as long as there was a pre-packaged delivery for specific groups. It would be important to present the information in a way that got the attention of the target audience, gave them something meaningful to do, and a vehicle for them to do it with. Ginny agreed to dig further into the numbers and produce a summary of what Jean and Melanie had produced. Gary Bahr agreed to talk with staff at WSU about their interest in pursuing a research project in the future aimed at filling in some of the gaps in the current data in order to meet the original project goals, and offering incentives for grower participation.

The meeting adjourned at 3:14pm.

Resources Requested

Recommendations for GWAC

Deliverables/Products Status

Proposed Next Steps

Ginny Stern will summarize Melanie and Jean's analyses of the deep soil sampling data with the goal of initiating discussions with stakeholder groups on changing practices. Gary Bahr will contact WSU about their interest in designing a future deep soil sampling project.