

Soils, Forages & Water Dynamics Course

By Lisa Belleville



Sept 13th was the first day of a 5 day series of a new round of courses that the Peace River Forage Association is partnering with UNBC and Shell Canada to organize. The new course title is Soils, Forages & Water Dynamics and there are new topics and resource people for those that want to continue learning with us at these very interactive field days.

Day 1 of the new course posed the question: Can we make pipelines disappear or blend into the landscape? The chilly morning began with hot coffee while we registered at the Thomson's Farm at Mile 23 on the Alaska Highway. From there, we car pooled to the Shell Pipeline Site located along the Stewart Lake Rd. A number of Shell representatives from different departments joined the course and led the morning orientation and discussion. Jim Chramosta, Regulatory and Environmental Specialist, explained Shell's interest in the day's question and its relation to each of their 8 principles. Abe Garcia, Project Construction Advisor, gave an overview that included the site's history and construction practices used.

At this site, the topsoil and upper subsoil were salvaged in separate lifts to maintain the land's agricultural capability for reclamation purposes. Each phase of the pipeline construction posed varying challenges for its final reclamation. Dan Webster, an environmental consultant, shared his experience with topsoil storage and hydro-seeding at the site. After some time, a section of the buried topsoil was moved, spread and seeded with care. However, there was little success with re-vegetation. Research proved that the aerobic microbes were dormant approximately 1 m below the surface of the large topsoil stockpiles.

The participants discussed mitigation strategies that included mixing topsoil piles during storage and adding inoculations to kick-start the microbes prior to spreading.

There were 4 stations or approaches that spoke to the question of the day each located at various spots within the pipeline site and led by wise station masters. The first station led by Bill Wilson asked two ancillary questions: What have we learned about fall seeding, techniques and mixes? What about seeding rates and fertilizing? The groups walked along the pipeline right-of-way where, during the fall of 2012, different seed mixes and fertilizer rates were used within sample plot areas. Participants compared the composition and health of each area and discussed factors that contributed to the success or failure of the plots. As an interactive demonstration, Bill displayed the seeds in glass jars to show the size and weight of the different seeds. We experienced bridging effects of the seeds by tipping the jars over to encourage the seeds to fall through our fingers. Then, participants took turns seeding over a large white sheet spread on the ground where it was clear how techniques and seed mixes affected the rate. It was noticeable that optimal seeding rates were achieved by using a combination of different seeds as well as a fertilizer.



Bill Wilson shows Bess Legault and David Miller how different seeds flow or bridge in seeders & broadcaster seeders.



Bill Wilson illustrates the important difference between % of seeds in a mixture by weight vs. % by seed count.



Lori Vickers, Lynn Norman, Pat Sutherland, Cali Seater, Jim Little and Carmen Schneider learn about weed control strategies from Kari Bondaroff.

The second station led by Kari Bondaroff asked an additional question: What are the plants telling us? As a proactive measure, Kari put up a canvas tent to display an array of resources and nuisance plants found in our region. As an exercise, the participants used the available resources to identify each sample exhibited within the tent. As Invasive Plant Program Manager for the Peace River Regional District, Kari offered extensive resources for identifying, locating and managing nuisance plants while referencing places for additional information. *(continued next page ...)*

Soils, Forages & Water Dynamics Course cont'd



Bill McGill demonstrates how to measure water infiltration and soil moisture (photos left & above). He shows Kristin Kendrew how to measure soil compaction and take bulk density samples (right).

At Kari's station, each group played a fun golf game where we received a management scenario involving nuisance plants. The end score was determined by the number of strokes each person received. The more positive management strategies we had, the better the score! One of many interesting management techniques was training cattle to eat the heads of Canada Thistle.

The third station led by Bill McGill asked a compounded question: What are the soils telling us in terms of infiltration, compaction and soil health indicators? To prepare for the dynamic exercise, Bill installed metal rings into the surface soil within the pipeline site and added a known amount of water. A participant from each group added a specified amount of water to the soil within the ring while Bill recorded the time it took for the water to completely disappear. As a group, we discussed the factors that affected water infiltration including soil moisture and compaction. We took turns using Bill's clever instruments that measured soil moisture, compaction and bulk density. It became evident that water infiltration decreased with increased soil moisture and bulk density due to compaction. The groups discussed how compaction may reduce vegetative cover by restricting root growth, decreasing porosity and increasing erosion.

The fourth (& last) station led by Richard Kabzems and Sandra Burton asked a subsidiary question: What can soil and plant indicators teach us about water dynamics? To add to the quality of the discussion, Richard pre-dug a soil pit in the upland forest and Sandra classified the soil series as Moberly. Moberly soils are loam to clay loam and occur on hilly topography where stones and gravel are common, especially where the underlying bedrock comes close to the surface. These facts came true to life as we hit bedrock at about 80 cm deep. As a group, we looked at the many indicators surrounding us such as vegetation type, canopy cover, surface soil type and depths to discuss the water dynamics in the upland forest compared to the pipeline site. It was apparent that deep, dark topsoil created the best medium for retaining water while reducing opportunities for nuisance plants to flourish.



Richard Kabzems demonstrates what soil texture and native indicator plants tell us about water dynamics.

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Bill McGill, Dan Webster, Bill Wilson,
Kari Bondaroff, Richard Kabzems, Sandra Burton

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Darryl Kroeker, Carmen Schneider,
Julie Robinson, Talon Johnson

Thank you to our panel discussion participants:

Abe Garcia, Jim Chramosta, Dan Webster

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