Soil Productivity Training and Fun: The Manitoba Summer Soils Tour

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Abstract

•The Manitoba Soil Science Society features a one-day summer bus tour to different areas of the province to view and study different soils and soil management practices. Attendees consist of graduate students in soils, summer students, extension agronomists and an increasing number of industry Certified Crop Advisers seeking Soil and Water Management credits.

•In recent years we have developed a number of exercises to prompt knowledge in soil properties and appropriate production practices while we visit 2-3 farms and exposed soil profiles. The workbook is modelled after the US National Park Service Junior Ranger program that features activity based learning, including use of the web based soil survey to complete fill-in the blank soil descriptions, soil productivity assessment based on texture, structure, drainage and soil nutrient analysis, soil health assessment, soil suitability ratings, detailed soil horizon and landscape drawings, and an enroute scavenger hunt of various ag industry, farm type and land uses. Evaluations have scored this learning as effective. Prizes from ag industry are awarded for participation during the homeward trek. Later host farmers receive a soil monolith dug and prepared from the soil pit.

Recent Soils Tours

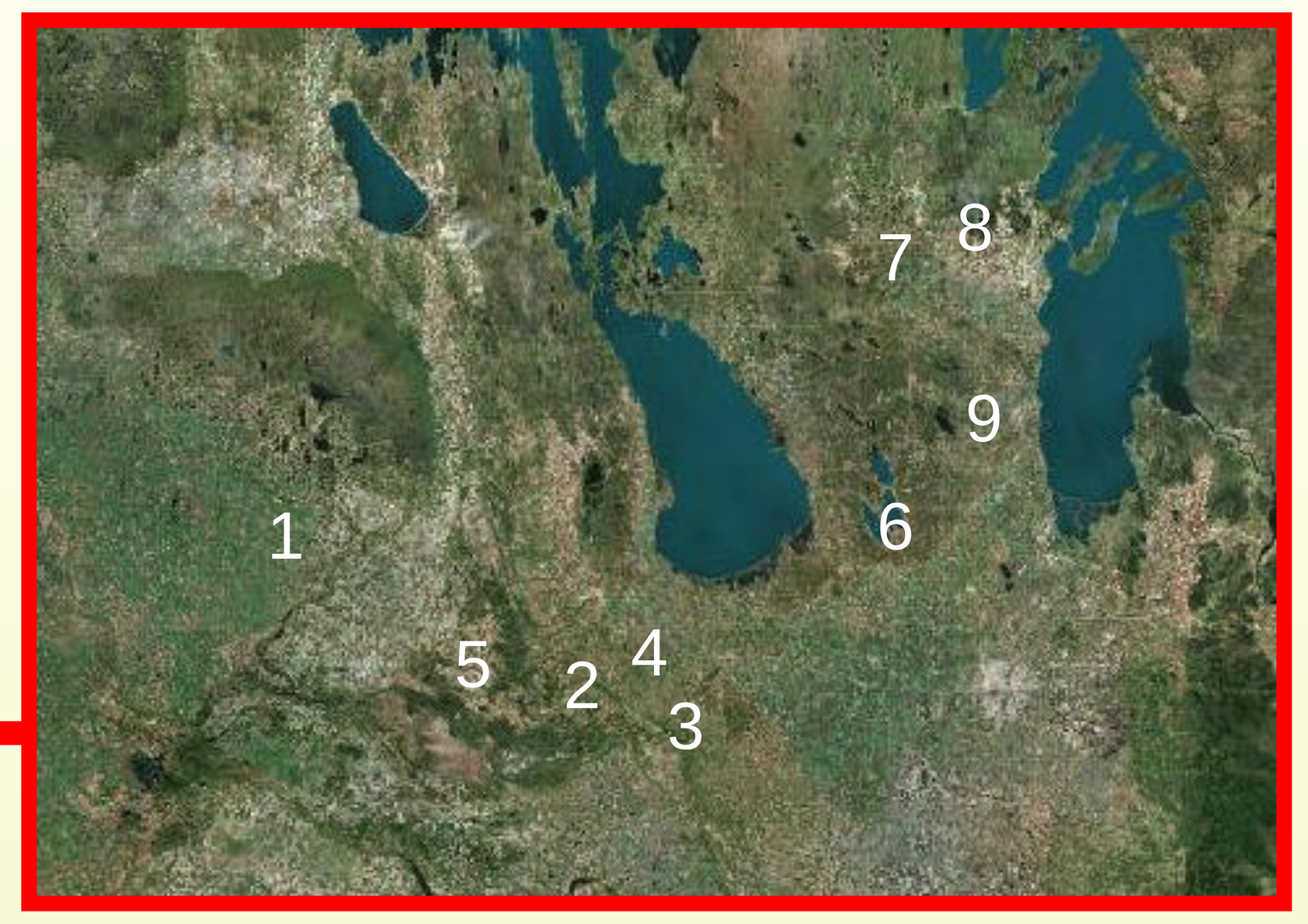


Figure 1. Soil trip locations. 2016, 2017, 2018

Since 2016 tours have employed "exercise workbooks[1]" to prompt education and interaction.

2016 = a western trek to our Provincial soil, the "Newdale clay loam" (1) and tile drainage of Gnadenthal wet sands (2)

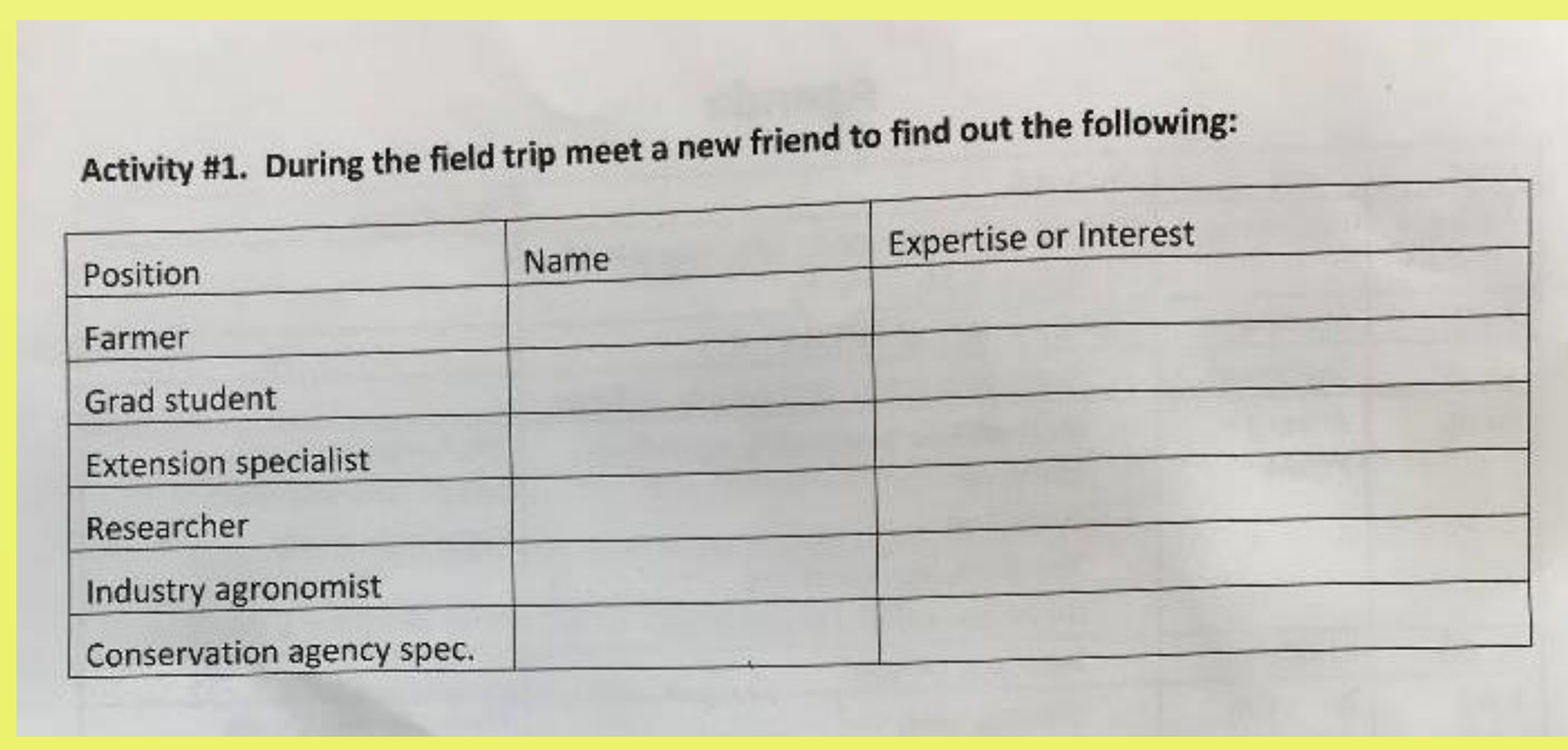
2017 = central Manitoba – vegetable production on Elm River silty clay loam (3), struvite extraction from municipal biosolids, cover and green manure crops (4), strip till field crop production on Almasippi sands(5).

2018 = the Interlake – lime quarry beneath Stonewall clay loam "overburden" (6), tile drainage of Fyala clay (7), management of peat soils (8) and iron chlorosis management on highly carbonated Lakeland clay loam (9)

Activity #1 – Meet the other soil trip participants

The 40-50 tour participants are from a range of soil related disciplines and are prompted to mingle:

- 32% plant and soil grad students
- 30% government extension
- 14% ag industry
- 10% university professors, instructors
- 6% federal researchers
- 4% environmental regulators



Activity #1. During the field trip meet a new friend to find out the following:

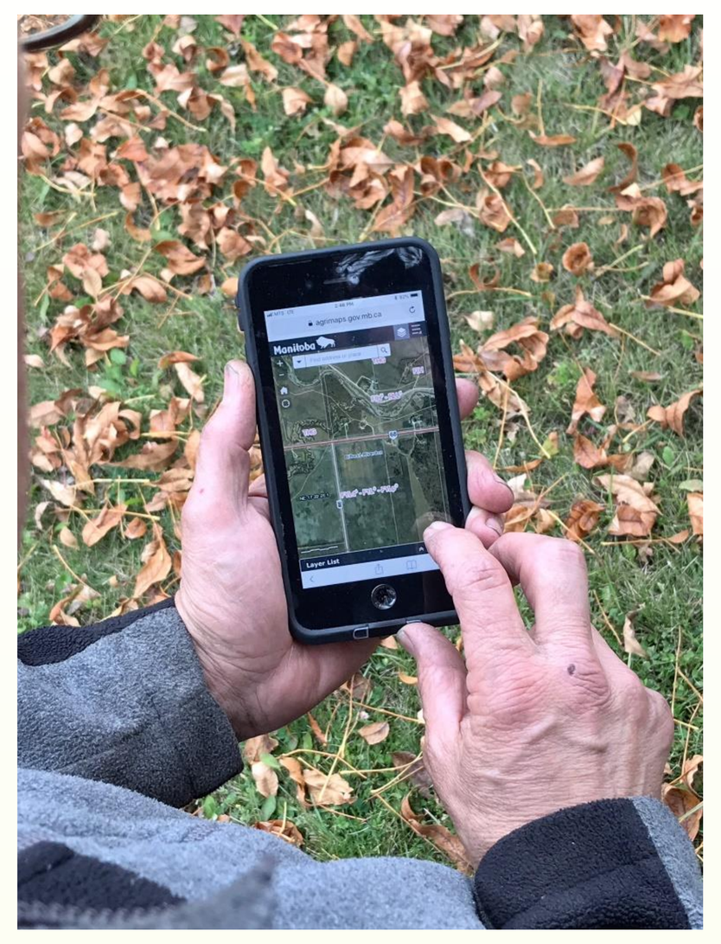
Position	Name	Expertise or Interest
Farmer		
Grad student		
Extension specialist		
Researcher		
Industry agronomist		
Conservation agency spec.		

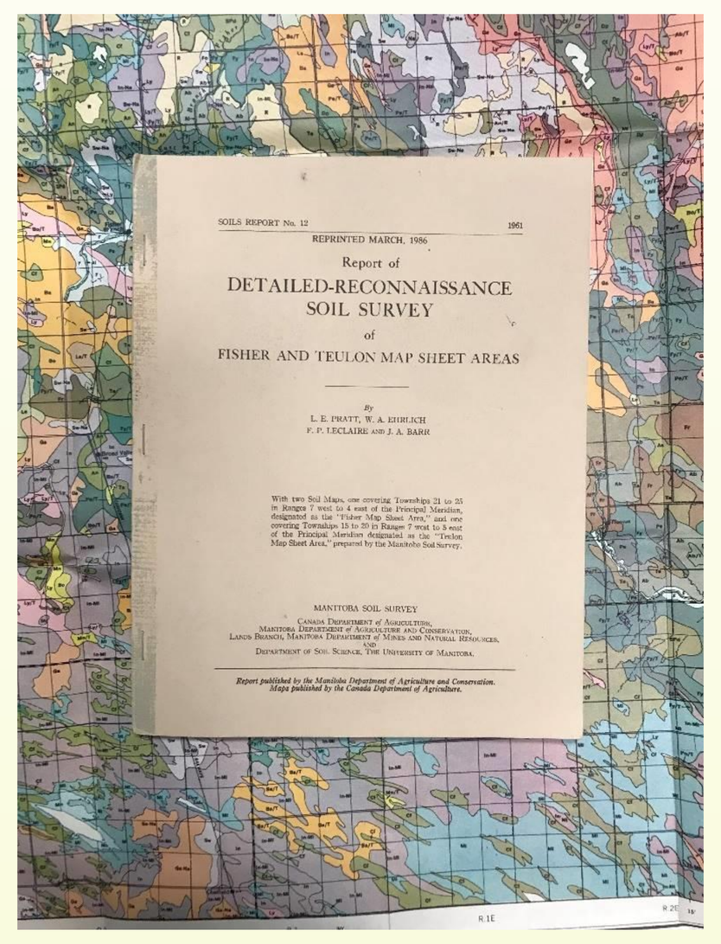
CCA CEUs are offered:

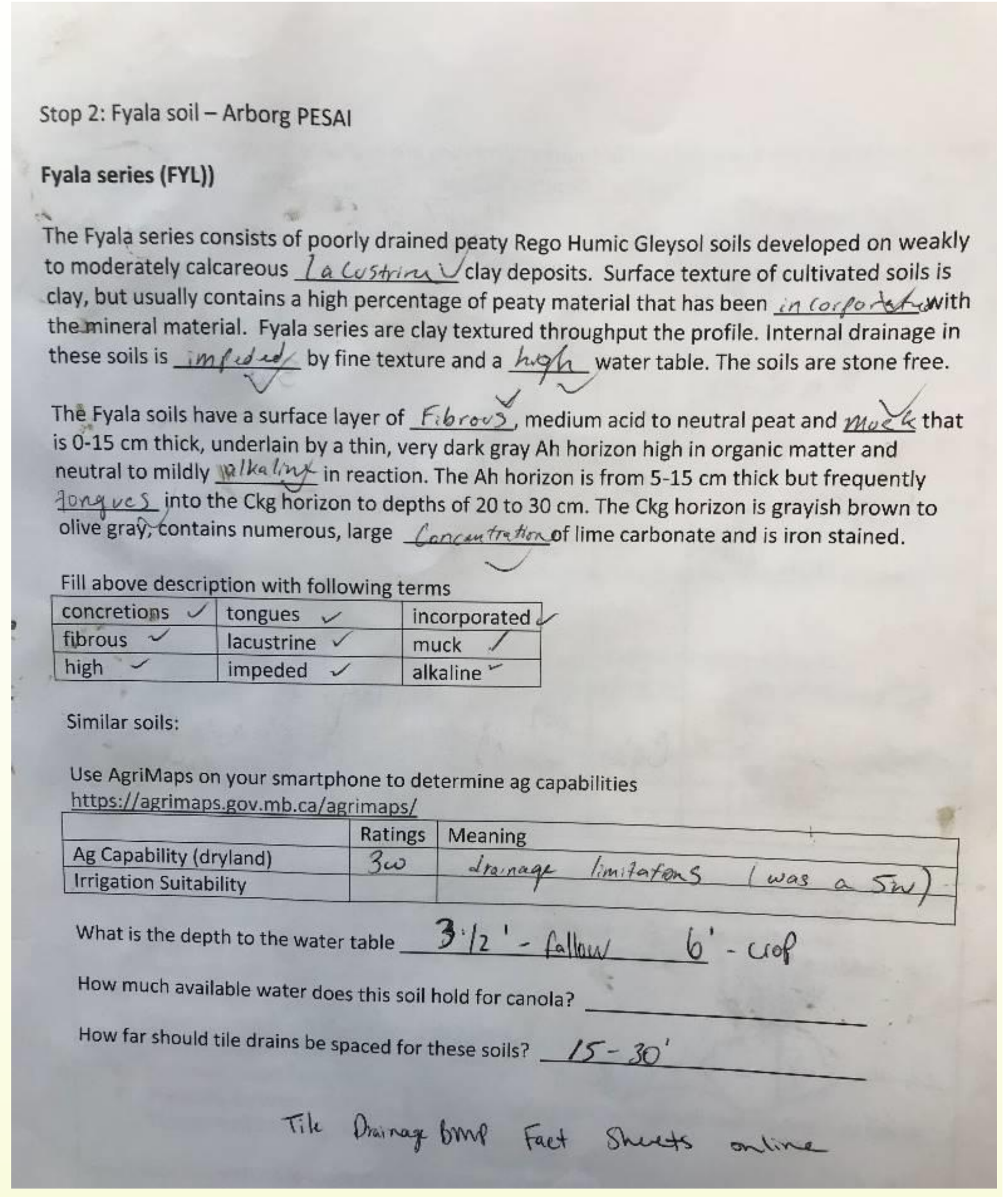
- 5.0 in Soil and Water Management
- 0.5 in Nutrient Management

Activity #2: Soil identification and description

To identify and describe the soils, participants are encouraged to use web-based AgriMaps soil map tool (https://agrimaps.gov.mb.ca/agrimaps/) or the papercopy soil report, to "fill in the blanks" .







Stop 2: Fyala soil – Arborg PESAI

Fyala series (FYL))

The Fyala series consists of poorly drained peaty Rego Humic Gleysol soils developed on weakly to moderately calcareous lacustrine clay deposits. Surface texture of cultivated soils is clay, but usually contains a high percentage of peaty material that has been incorporated with the mineral material. Fyala series are clay textured throughput the profile. Internal drainage in these soils is impeded by fine texture and a high water table. The soils are stone free.

The Fyala soils have a surface layer of Fibrous, medium acid to neutral peat and muck that is 0-15 cm thick, underlain by a thin, very dark gray Ah horizon high in organic matter and neutral to mildly alkaline in reaction. The Ah horizon is from 5-15 cm thick but frequently tongues into the Ckg horizon to depths of 20 to 30 cm. The Ckg horizon is grayish brown to olive gray, contains numerous, large concentration of lime carbonate and is iron stained.

Fill above description with following terms

concretions ✓	tongues ✓	incorporated ✓
fibrous ✓	lacustrine ✓	muck ✓
high ✓	impeded ✓	alkaline ✓

Similar soils:

Use AgriMaps on your smartphone to determine ag capabilities
https://agrimaps.gov.mb.ca/agrimaps/

	Ratings	Meaning
Ag Capability (dryland)	3w	drainage limitations (was a 5w)
Irrigation Suitability		

What is the depth to the water table 3½' - fallow 6' - crop

How much available water does this soil hold for canola? ______

How far should tile drains be spaced for these soils? 15 - 30'

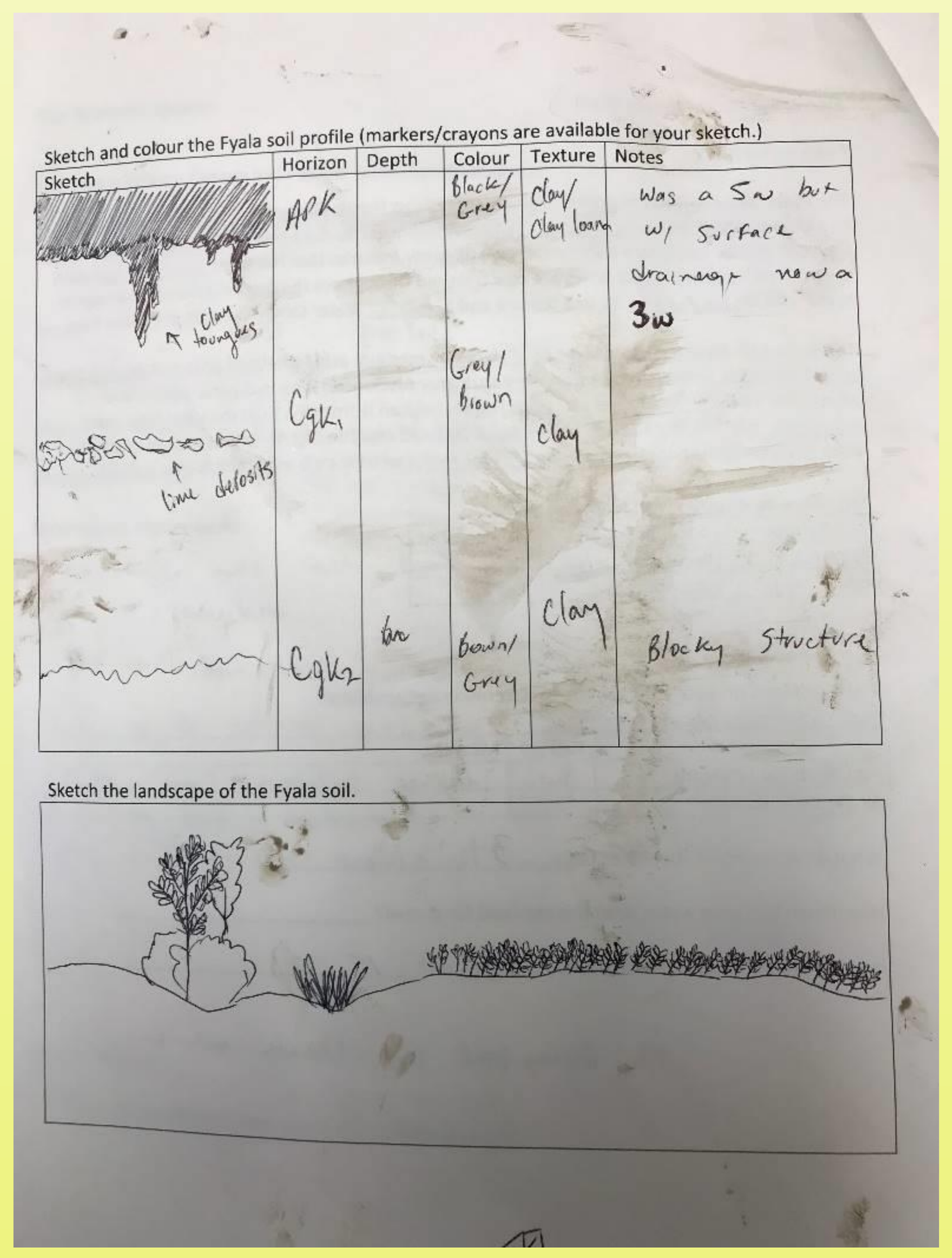
Tile Drainage bmp Fact Sheets online

Comments:

- *Really liked fill in the blank exercise*
- *informative workbook but unable to get data on phone*

Activity #3: Soil profile descriptions

Our "pit crew" of practical federal and provincial soil specialists describe the soil characteristics at each site. Participants were invited to complete their own profile descriptions and to verify textures and colours



Sketch and colour the Fyala soil profile (markers/crayons are available for your sketch.)

Sketch	Horizon	Depth	Colour	Texture	Notes

Sketch the landscape of the Fyala soil.

Soil monoliths are also extracted at each pit site

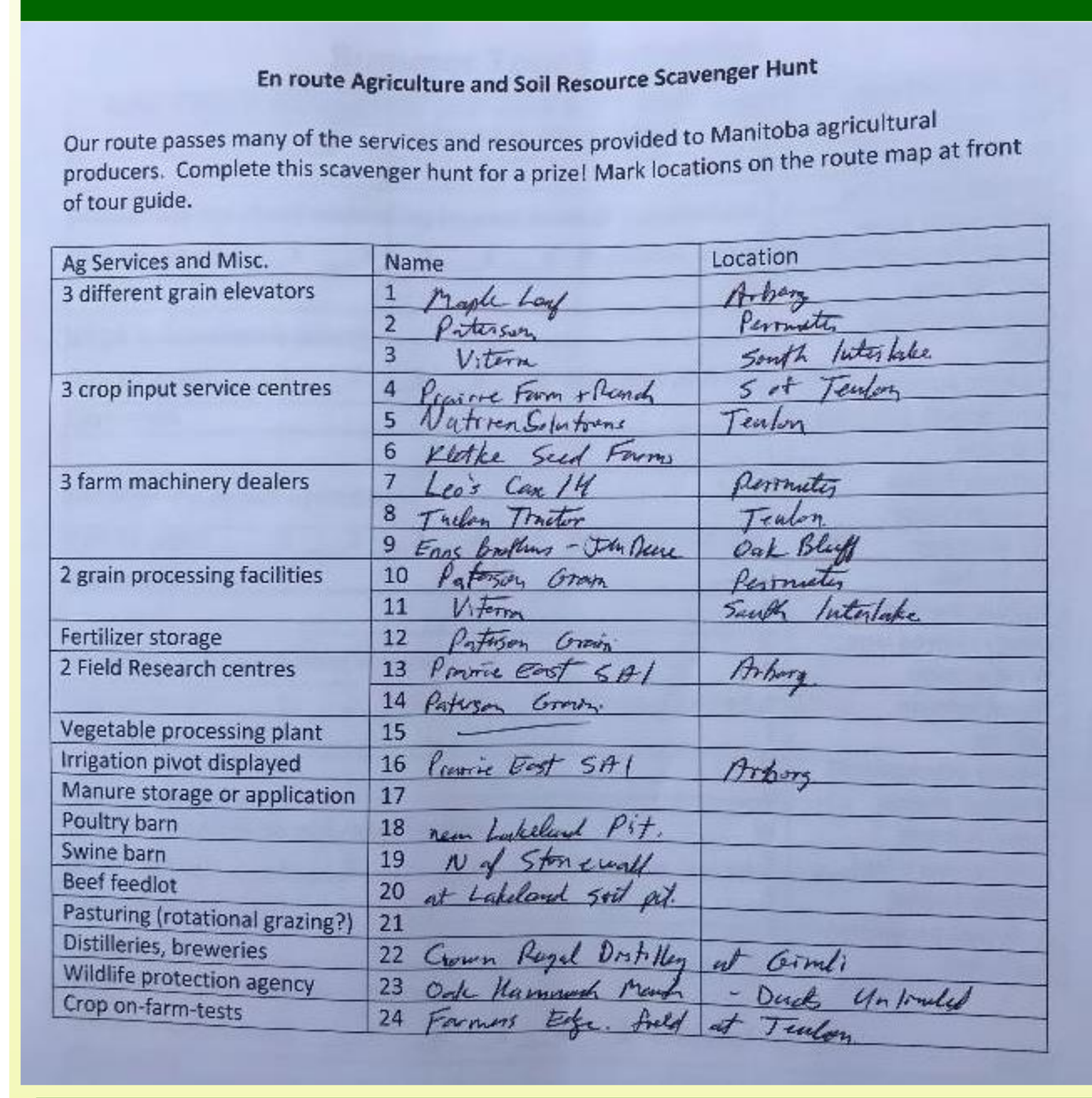
Activity #4: Soil management considerations

A soil management issue is generally presented at each site: tile drainage suitability, fertility management, strip tillage, cover crops.

Comments: *Really appreciated the farmer perspective.*

Would be great to have the farmer at each site.

Activity #5: Ag industry/land use Scavenger Hunt



En route Agriculture and Soil Resource Scavenger Hunt

Our route passes many of the services and resources provided to Manitoba agricultural producers. Complete this scavenger hunt for a prize! Mark locations on the route map at front of tour guide.

Ag Services and Misc.	Name	Location
3 different grain elevators	1 Maple Leaf	Arborg
	2 Paterson	Perimeter
	3 Viterra	South Interlake
3 crop input service centres	4 Prairie Farm + Ranch	S of Teulon
	5 Nutrien Solutions	Teulon
	6 Klotke Seed Farms	
3 farm machinery dealers	7 Leo's Case IH	Perimeter
	8 Teulon Tractor	Teulon
	9 Enns Brothers – John Deere	Oak Bluff
2 grain processing facilities	10 Paterson Grain	Perimeter
	11 Viterra	South Interlake
Fertilizer storage	12 Paterson Grain	
2 Field Research centres	13 Prairie East SAI	Arborg
	14 Paterson Grain	
Vegetable processing plant	15	
Irrigation pivot displayed	16 Prairie East SAI	Arborg
Manure storage or application	17	
Poultry barn	18 near Lakeland Pit.	
Swine barn	19 N of Stonewall	
Beef feedlot	20 at Lakeland soil pit.	
Pasturing (rotational grazing?)	21	
Distilleries, breweries	22 Crown Royal Distillery	at Gimli
Wildlife protection agency	23 Oak Hammock Marsh	- Ducks Unlimited
Crop on-farm-tests	24 Farmers Edge. field	at Teulon

While en route between soil pits, participants are encouraged to record specific agricultural activity or land use

Evaluations

Participants have scored the activities well (1= poor, 5 = excellent)

Activity	2017	2018
Workbook exercises	4.43	4.28
On bus Program	4.30	4.46

Comments: *Workbook was well curated and informative*

- *Fun workbook*
- *Workbook really made them work*
- *Lots of writing can distract from listening*

Prizes

Soils participants were rewarded for their workbook efforts through prizes donated by sponsors:

Agrium – ESN
•A&L Laboratories
•AgVise Laboratories
•Farmers Edge Laboratories
•Fertilizer Canada
• MB Pulse and Soybean Growers Assn

Host farmers receive mounted soil monoliths for their farm soil

[1]Note: pdf versions of Tour workbooks are posted at the MSSS website https://www.mbsoils.ca/