

Farmland and Wildlife

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DF&WT-UBC GLSA Soil Evaluation Commences

DF&WT is pleased to announce the receipt of a five-year research contribution through the Investment Agriculture Foundation of BC (IAF). The project will be carried out in partnership with researchers from the Soil, Water and Sustainability group within the Faculty of Land and Food Systems at UBC.

"We are excited to continue our long-standing relationship with UBC and IAF," remarks Christine Terpsma, DF&WT Program Coordinator. "The bulk of our original stewardship program research that took place in the early nineties was conducted in partnership with UBC. At that time, IAF was instrumental in supporting our research, which laid a foundation for the best management practices we continue to encourage through our programs today. We are grateful to have had the opportunity to partner with UBC, with the support of IAF, numerous times over the past two decades."

Current funding will support an evaluation of a full cycle of fields enrolled in the Grassland Set-aside (GLSA) Stewardship Program. From the planting date to the time grasslands are tilled back into the soil for production, participating GLSAs will be monitored to determine how quickly soil benefits accrue, and how long those benefits persist after incorporation. The research is comprised of two complementary components: the first focuses on set-aside fields entering the program in 2015, while the second component is concerned with fields where set-asides were incorporated into the soil. The evaluation of grassland set-aside impacts on soil quality during the four years following seeding will be done by a research team led by Associate Professor Dr. Maja Krzic (Faculty of Land and Food Systems, UBC).

In April of this year, soil samples were collected from 10 fields in Delta and Richmond to allow establishment of baseline soil properties, reflective of conditions prior to a GLSA seeding. These fields will be monitored for a total of four years to evaluate soil improvements over time due to GLSA management. Monitoring will include soil organic matter content, structure stability, bulk density and aeration porosity.

The second component of the research project is under the direction of Dr. Sean Smukler, Associate Professor

and Junior Chair of Agriculture and Environment at UBC. With the assistance of a research team, Dr. Smukler will evaluate how long soil benefits, as a result of GLSA management, will persist in the soil after the field's return to crop production. Four fields that had been GLSA for the last four years have been selected for the study. The GLSAs in these fields were mowed and incorporated into the soil this spring and now have been planted with production crops. Over the next two years the UBC team will track the availability of nutrients and other soil quality indicators to compare with fields that have not had GLSAs. "While there are many reported benefits for increasing soil organic matter, the long-term impact of GLSAs on crop production has not yet been carefully quantified," says Dr.

Smukler. In future years of the project, the UBC team will work with Delta farmers to track benefits to subsequent production crop yields and the economics of using GLSAs as a management tool.

Ultimately, these two components of the research project complement each other to provide farmers with a comprehensive understanding of the Grassland Set-aside program. "Farmers need this information to make decisions regarding their rotations and the management of their farm operation," says Christine.



UBC M.Sc. student Khalil Walji monitoring a cropped field for the DF&WT-UBC Soil Evaluation.

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"To be able to provide farmers with specific data on how their soil changes under a GLSA treatment is valuable information. Farmers ask if they can achieve the same soil benefits from a three-year set-aside as a four-year set-aside. They want to know how long nutrients persist in the soil after the GLSA is returned to production. Farmers have seen value in this program for over twenty years, but to quantify the benefits and address the challenges of GLSA management – these are the important goals that this research will help us achieve."

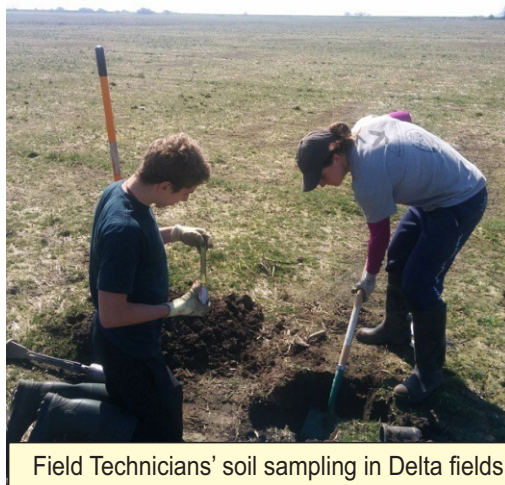
The five-year project is one of the most significant research initiatives the Trust has undertaken. "I think it's important to recognize that our farmers are doing all

they can to maintain their soil resources," notes Christine. "Farmers continue to face pressure from competing land uses as well as other challenges to

farming in the Fraser River delta. Despite these challenges, our farmers are still utilizing this program to its full potential. Conducting a research project of this scale will benefit the local farming community by giving them the answers they need to maximize their soil productivity and steward their soil resources for continued long-term management."

Funding for this project is provided in part by Agriculture and Agri-Food Canada through programs delivered by the Investment

Agriculture Foundation of BC.



Field Technicians' soil sampling in Delta fields

Barn Swallow Monitoring Continues in Delta

Chloe Boyton, Junior Ecosystem Technician

Have you ever seen a group of birds following dangerously close behind a tractor, diving skillfully for insects? These dynamic birds that frequent many farms and stables are known as aerial insectivores. Several species of these birds have been steadily declining and reasons behind their decline are still uncertain.

This summer I am conducting research in the Ladner area which is a continuation of work done by SFU Master's student Olga Lansdorp, examining *Hirundo rustica* (Barn Swallow) and *Tachycineta bicolor* (Tree Swallow) productivity relative to agricultural landscapes. The focus of my research this year is on Barn Swallows, as their populations have been rapidly declining in Canada. I am specifically examining post-fledging chick survival and habitat use, which is the three to five week period after

chicks have left the nest, and before their long migration south. The post-fledging stage is a crucial part of their life cycle, and even more important because there is little known about this period.

For the months of May and June, my field assistant (Jessie Russell) and myself monitored Barn Swallow nests around the Ladner area, which included several different agricultural sites with and without livestock. Twice a week we checked nests to determine the overall productivity (essentially whether the chicks successfully left the nest) as well as counting the number of chicks per nest. Additionally, we set up nets that move with the wind to collect insect samples so we can later identify types of insects found at the different site types. We are also continuing to monitor Tree Swallow nest boxes to gather information about their reproductive success this season.

To study the post-fledging period we fastened radio tags on chicks and followed them using radio receivers to determine where they went after for part of June and July. We followed individual chicks several times a week for about three to five weeks. By tracking the juvenile Barn Swallows, we hope to gain a better insight into what type of habitat is important during this life stage, as well as sites that are important for foraging and roosting. We also hope to determine if there is a higher rate of mortality during this period of the Swallows' lives, and if habitat and insect abundance are possible contributing factors to the alarming decline of the Barn Swallows. Stay tuned for reports on our research progress in future "Farmland and Wildlife" publications. You may even find myself and my colleague, Jessie, leading Barn Swallow education at the DF&WT booth at the "Day at the Farm" community event on September 12, 2015.



Barn Swallow chicks in nest. Photo: Olga Lansdorp

The Benefits of Farmland Hedgerows: Research Results

Bryanna Thiel, M.Sc.

Ecosystems are complex. They exist at many different scales and vary widely in their makeup. They can be wild and untouched, or managed and cultivated by human activity. Ecosystems also provide services. They provide us with access to abundant food sources, recycle vital nutrients, help regulate the climate, and also provide spaces for us to play and learn. The diversity of their plants, animals, and microbes, and the way these living organisms interact with the non-living environment (soil, air, and water), provide richness to these systems.

In 2012 I started a research project with DF&WT and the UBC Sustainable Agricultural Landscapes laboratory to determine: **Do planted hedgerows provide the same ecosystem services as remnant ones?** We know DF&WT's Hedgerow Stewardship Program brings complexity to farmland ecosystems by planting diverse grasses, shrubs, and trees along the edges of fields that are not in production. These hedgerows are important for conservation. They provide a number of services to the region including habitat for wildlife and pollinating insects; acting as windbreaks to reduce soil erosion and crop damage; and also sequestering carbon.

It turns out that DF&WT's hedgerows hold immense value to farmland in Delta from a conservation point of view. First, compared to remnant hedgerows, which are hedgerows that are not planned, planted, or managed by DF&WT in the region, I found that the ones in the program had a much greater diversity of trees and shrubs. This is important because it improves the diversity of habitats for birds, animals, insects, and even soil organisms. Also, the diversity of trees and shrubs can impact the amount and type of decomposable organic material (such as dead leaves and roots) in these non-production farmland areas. I found this to be true in Delta since there was greater carbon (which is a primary component of organic material) stored in the soil of DF&WT planted hedgerows.

This information is valuable because carbon is a critical part of carbon dioxide (CO₂), a greenhouse gas which plays a role in warming our climate. As a result, finding ways in which we can increase the amount of carbon stored in non-gaseous forms is critical for diminishing atmospheric greenhouse gases and consequent climate change impacts. For this reason, I also looked at how much carbon was

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Bryanna sampling a farmland hedgerow. Photo: Christine T.

stored in the trees and shrubs I measured. Between the planted DF&WT and the remnant hedgerows (unmanaged trees and shrubs) around Delta, I didn't find any difference in the amount of carbon that was being stored in their vegetation despite the fact that the remnant hedgerows were more mature. This may be because the diversity of the planted hedgerows results in a different overall hedgerow structure, compensating for the age difference.

Working with farmers and on farmland in Delta was an experience in which I take much pride. The farming community is passionate about their industry, their heritage, and the conservation work they are doing to maximize the benefit farming has for the region's food production and environment. When I presented the results of this research to the DF&WT Board, it was really interesting to have discussions what other research could be done regarding the impact of hedgerows on farmland, including how they may impact crop production or water usage on local farm fields.

DF&WT's hedgerows are an important component of the agricultural landscape, and I am happy to have been able to provide more information about the ecosystem services they provide to the region.

10th Anniversary "Day at the Farm" Event!

It's coming up fast! The 10th Annual "Day at the Farm" community event will be held on **September 12, 2015**. We are pleased to celebrate 10 years of agriculture and conservation education at the Westham Island Herb Farm (4690 Kirkland Road, Ladner). Bring the whole family for a fun-filled day!

Entry is free or by donation. Be sure to bring non-perishable food items for the Food Bank!

As this is a working farm, we ask you to please leave dogs at home.



Wildlife Tidbits by John Hatfield

Ever try sitting on 24 eggs for approximately three weeks? A Gray (Hungarian) Partridge hen did just that! I found her sitting quietly on her nest near our headquarters at the Last Mountain Lake National Wildlife Area (NWA) in Saskatchewan. The normal number of eggs per nest for some of our common birds are: 8 - 10 for Mallards; 3 - 4 for Killdeer; 4 - 6 for Canada Geese; and 3 - 4 for Robins. This is the largest number of eggs that I have ever seen any bird sit on! Keep in mind that this Partridge is about the same size as a Bantam Chicken. I kept careful watch on this nest throughout the incubation period. All the eggs hatched and soon I counted 24 little yellow balls of fluff scooting around in the grass, chasing insects!



Student Chefs will be preparing fresh local fare at the Agriculture in the Classroom booth at "Day at the Farm" on September 12, 2015.

Thank-you to our Stewardship Program supporters:



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