

Plants Dig Soil | Season 4 | Episode 5 | 029 Think Outside the Field | July 7, 2022

Hello! This is Scott Gillespie and welcome to the fourth season of Plants Dig Soil. In this podcast, you will learn how to think critically about regenerative agriculture claims so that you can apply proven and profitable practices that benefit your farm now and in the future.

[TRANSITION MUSIC]

In the past two episodes I've talked about ways we can add some diversity to our fields without sacrificing yield. In the case of intercropping cash crops, we may even get more yield from a piece of land. In the case of intercropping cover crops we have similar cash crop yields, but we invest the overyielding potential in the soil so that we can see the returns in the years and decades to come.

Both of those systems work well in areas of the field that produce well. But what about the marginal areas? These are the areas that either are in your fields now and don't produce agricultural crops or they could be beyond them. They could be on land you own, or they could be areas beyond your land.

Let us start in our fields. You know of areas within them that just never really do well. Have you ever put a number to it? You can probably find areas that don't pay just by thinking of them as you harvest, but you could get more scientific.

I read about a fascinating case study in Saskatchewan a few years ago¹. I'll link to the article in the transcript. Larry Durand, an agrologist at Field Good Economics in Humboldt, Saskatchewan used SWAT maps (Soil Water and Topography) to map out the low and high potential areas of a field. Putting the low producing areas into forages resulted in \$5000 less revenue. However, it also meant \$11000 less expenses.

You may say: I don't have animals, why would I plant forages? To that I would respond, if that's the only thing that grows, why not? Does it make more sense to spend \$11,000 dollars and get only \$5000 back? Losing \$6000 every year vs having an area in forages for zero cost seems ludicrous to me. Usually, poor areas have something limiting them and in this case it was salt. The forages may not give you much now but in the years to come they will do more than planting an annual crop every year and getting less back than you put into it. It may take a generation but in time they will help to reclaim that area.

In times of drought this area may be the only green patch in the field. You may be able to take a cutting off it and sell to livestock farmers desperate for feed. You may just leave it and let it be the refuge for birds, animals, and insects that live in your area.

Why would you do that? It turns out that these natural areas support the beneficials that help your crop. It will never be 100% control, but studies show that farmers that have these natural areas near their farms tend to have less pest pressure and tend to need to use less pest controls². Anecdotally, I know of a farmer that rents land near a wildlife area and he says he definitely sprays less there.

In the era of insecticides these areas likely did not pay. However, as insecticides are being deregistered and public pressure means less access to them, these may be your best bet for defending your crop. Newer insecticides that are pollinator friendly may still give you the tools you need and be able to keep these places intact. However, as we've seen with every other chemical control out there, the pest always finds a way to develop resistance to it.

Lowering your insecticide use may not only pay in the current crop year. A research project stumbled upon a fascinating biocontrol that gets wiped out most years due to unnecessary use of insecticides³. A parasite of the wheat stem sawfly was found to emerge in canola fields. They were likely there because the previous crop was wheat and they overwintered in the stubble. As they emerge in the spring, you'd think they would be unhappy to find they are not in a wheat field. However, they are – they need the canola flowers to give them a little sugar rush to get ready to look for their victim – the pest in our wheat fields.

If we spray the canola for insects while they are flowering, we wipe these beneficial out. By killing them we have no natural enemy for the pests in our wheat and we need to spray them out. If there is a legitimate pest in the canola that needs spraying, then it may need to be done. However, choosing an insecticide or a timing of application that save the non-target species pays us back in the wheat as well.

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Having areas of refuge is important, but how much do we need? One researcher put forward the idea that we need 30% of our land in non-agricultural use to support these populations⁴. Yes, I understand that's unlikely to happen, but what can we do to get close to this?

The first thing, of course, is to take existing areas of the field that don't produce and let them go back to nature. The next thing is to look around and see what can be encouraged. Edges of the fields or odd shaped areas that machinery struggles to get to are obvious first choices. Ditches are another area that you can encourage to go to nature.

Scale is going to be important. Dr. Paul Galpern spoke at the Farming Smarter Conference in Lethbridge, Alberta last winter. He has studied the "messy areas" that border fields. He found that the effect radiated out for about 75m (~250'). That's not a lot. We'd need a patchwork of small fields to really make this work. However, we can work towards this and may look for ways to put annual pollinator strips through our field each year.

One big concern that I can see is that these natural areas may not discriminate against pests. Studies are on-going, but a rule of thumb that I came across is that weedy areas, that is, plants that tend to be undesirable plants in our agricultural systems, tend to host pests and native areas tend to host beneficials⁵.

I've seen this to be the case while scouting a new crop to my area: quinoa. It is in the same family as lambsquarters and shares many of the same pests that attack it. We often don't think of weeds as having pests, but they do. The difference for them is that if they don't reach 100% of potential it doesn't really matter. As long as they make enough seeds to ensure more of their progeny the following year, they have succeeded.

One insect that attacks lambsquarters is a kind of stem borer with the Latin name *Amauromyza karli*. Imagine the fly's coming across an entire field of plants they can lay eggs on? Normally they must seek out the lambsquarters within other crops, and these plants tend to get killed before they can reproduce. Here they have a whole field full of plants they love, and they are being protected by the farmer. It's unknown exactly how this insect lives its life on the Prairies because it was normally not seen as an important one to study.

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The next obvious question is how to pay for these areas. When there is an obvious economic benefit, as in the case study at the beginning of this episode, then there is a good business case to it. When the benefits are mostly for society, then society should be paying for them.

In the United States, Prairie Strips have been so successful in Iowa that they have been added to the Conservation Reserve Program so that farmers can get paid to use them anywhere in America⁶. Unlike traditional grass waterways, they run perpendicular to the land to slow the flow of water through the landscape. In irrigated areas they may be adapted for use in the dry corners outside of an irrigation pivot. If its very dry it may mean just taking the end gun area, which is usually a poor performing area of the field and converting this to natural areas. A small area around the pivot centre would give a refuge in the field.

In Canada, Ducks Unlimited has announced that it will help farmers convert marginal areas to forages or wetlands. Early settlers focused on draining wetlands as they saw them as problem areas on the landscape. It turns out, the landscape needs these areas. They help to collect water in high rainfall and high snowfall times and can be a source of animal feed in the dry time. This is in addition to the benefits of having other insects and birds around that help your crop. Beyond pure economics, they can be a nice place to visit on the farm.

Turning our attention to the hot button topic of carbon sequestration, I believe looking beyond the field may be a better place to focus our efforts on for this. Instead of focusing on making all of agriculture as carbon sinks, look to the natural areas around and focus on them.

Henry Janzen spoke about soil health from the perspective of a soil scientist at a recent Alberta Institute of Agrologists webinar. His main point was that it is all about your perspective. We may look at a saline area full of kochia and think it's poor soil. From the perspective of the kochia and all the microbes underground that it supports, that's healthy. The kochia benefits from the salt because it can handle higher concentrations and favours it over other plants. Below ground there may be insects that happily live there because there are less predators.

Carbon is good for agriculture, but it's best use is if its cycling. We can focus on the best land for annual production and by maximizing it we can spare the other areas. Riparian areas are best used as filters for the rivers and wetlands they surround. Excess nutrients into these areas can be brought back to the agricultural system by harvesting or grazing occasionally instead of letting them get into the water.

Part of the problem that Prairie agriculture has is how the land was divided up. Grids were placed over the landscape and 160-acre parcels were carved out. If a stream went through your quarter of land, you felt like you had lost some of what you were owed.

This contrasts with the Indigenous view of the land. They saw the whole and used the best areas. I remember chuckling when I read Buffalo Bird Woman dismiss the Prairie land for farming. She knew the best land was in the river bottoms. They could farm it for generations and move on when it became unproductive, or the tribe had grown or shrunk. It even had resources for building shelter and the banks could easily be adapted for food caches, not unlike root cellars. I've covered her life in more detail in a past episode called "017 The Long View on Regeneration" so I encourage you to go back and listen to it.

There are too many people here now to live like that. We can't go back to that time, but we can learn the principles and apply them. Our perspective can lead to tunnel vision. To a farmer and policy makers in agriculture – the only solution seems to be to pay them to sequester carbon. Environmental groups may focus solely on the natural areas. Looking at things together I'm sure we can find ways that both can exist and make for a better future.

[TRANSITION MUSIC]

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I always like to know how people that give out information for free actually make money. The podcast is free so that you can learn something new and get to know how I work through issues.

If you need a little more help than the podcast can provide, I am developing self-directed, online courses to help you dive a deeper into issues. Included in the courses are office hours that let you have time with me to fine tune your plans. Details are at my website: (<https://plantsdigsoil.thinkific.com/courses/cover-crops-prairies?coupon=newsletter>) and if you use the coupon code "podcast" (no quotes) at checkout you'll get \$20 off.

When you need more than that, I provide consulting packages that can be used in person, online, or a combination of the two (<https://www.plantsdigsoil.com/pricing>). Most people start with a Q&A session where I answer your top questions and we both get to know each other. Beyond that we can move to Farm Planning or an Annual Retainer.

If you live in Southern Alberta, Canada, I can provide scouting services throughout the summer with weekly field checks for crop staging, pest presence, and, under irrigated fields, soil moisture and weekly irrigation plans. I go beyond the standard crops of wheat, barley, canola, and peas to include things like potatoes, quinoa, and hemp. And of course, I love taking on cover crops.

My expertise is centred around the Canadian Prairies. I have a B.Sc. (Agr.) with an agronomy focus and a M.Sc. with a focus on Plant Science. Beyond my formal education, I have attained, and maintained, my Certified Crop Advisor designation and am a member in good standing with the Alberta Institute of Agrologists.

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See you next time.

¹ Karen Briere. Nov 12, 2020. The Western Producer. “‘Messy’ fields may help bottom line”
<https://www.producer.com/news/messy-fields-may-help-bottom-line/>

² Xerces Society. 2016. P.1 Habitat Planning for Beneficial Insects.
<https://xerces.org/publications/guidelines/habitat-planning-for-beneficial-insects>

³ The Growing Point Podcast. Jul 2, 2021. Alberta Wheat & Barley Commission. Parasitism of Wheat Midge and what you can do to help with Jennifer Otani (AAFC Beaverlodge).
<https://thegrowingpointpodcast.podbean.com/e/parasitism-of-wheat-midge-and-what-you-can-do-to-help-with-jennifer-otani-aafc-beaverlodge/>

⁴ Julienne Isaacs. Dec 23, 2020. Country Guide. “Less mowing, more flowers, more yield”
<https://www.country-guide.ca/crops/less-mowing-more-flowers-more-yield/>

⁵ Xerces Society. 2016. P.9 Habitat Planning for Beneficial Insects.
<https://xerces.org/publications/guidelines/habitat-planning-for-beneficial-insects>

⁶ Field Work Podcast. May 3, 2022. “The Genius of Prairie Strips”
<https://www.fieldworktalk.org/episode/2022/05/04/the-genius-of-prairie-strips>

⁷ Scott Gillespie. Apr 9, 2021. “017 The Long View on Regeneration”
<https://www.plantsdigsoil.com/podcast/017-the-long-view-on-regeneration>