

541 From EEFs to Organic Challenges: This Month in Regenerative Ag

#RealisticRegenAg | You've heard me mention that enhanced efficiency fertilizers (EEFs) can reduce greenhouse gas emissions, yet they seldom boost yields. But what if we adjusted their usage rates? This approach might make them more economically viable for farmers and more beneficial for the planet. In other news, I'll explore how long-term crop rotations benefit cash crops, the cost-benefit analysis of cover crop rotations, and a contentious issue in organic farming: Should organic growers facing unsolvable problems be permitted to temporarily revert to conventional methods to resolve these issues, and subsequently regain their organic certification? I'll delve into these stories, along with a few brief updates, in this month's roundup of regenerative agriculture news.

Welcome to Plants Dig Soil, a podcast about #RealisticRegenAg. I'm your host, Scott Gillespie, and I'm an agronomist from the western Canadian prairies specializing in climate-smart agriculture. I discuss scientifically proven practices that benefit the planet and, just as importantly, farmers' economic sustainability. Be sure to visit my website, www.plantsdigsoil.com, for resources and information about the services I offer.

Transcript is available:

<https://www.plantsdigsoil.com/podcast/from-EEFs-to-organic-challenges>

Articles mentioned in the podcast:

<https://www.producer.com/news/research-makes-case-for-superu/>

<https://www.realagriculture.com/2023/11/corn-school-how-rotation-impacts-yield-and-crop-resilience/>

<https://www.topcropmanager.com/flax-underperforms-on-canola-stubbl/>

<https://www.topcropmanager.com/cover-crops-a-powerhouse-tool-for-building-carbon/>

<https://www.futureecologies.net/listen/fe-4-8-ground-truthing>

<https://www.futureecologies.net/listen/fe-5-6-making-a-living>

<https://soilhealthinstitute.org/news-events/soil-health-institute-launches-slakes-a-free-smartphone-app-to-measure-soil-aggregate-stability/>

<https://www.agcanada.com/2023/12/are-buffer-strips-right-for-your-farm>

<https://mailchi.mp/organicfederation/alternating-between-organic-and-conventional?e=6cca96f713>

Realistic Regen Ag Channel (WhatsApp):

<https://whatsapp.com/channel/0029VaBofw37NoZxtgHSRI3S>

My consulting packages:

<https://www.plantsdigsoil.com/pricing/#consulting>

My funding service offerings:

<https://www.plantsdigsoil.com/pricing/#paperwork>

SCAP overview: <https://youtu.be/0icitHJR2Ik>

SCAP program details <https://www.alberta.ca/sustainable-cap.aspx>

My course: Profitable From the Start: Cover Crops for the Prairies:

<https://plantsdigsoil.thinkific.com/courses/cover-crops-prairies>

Newsletter signup:

<https://mailchi.mp/plantsdigsoil/newsletter>

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Podcast Subscription Apps: <https://podcasters.spotify.com/pod/show/scottcgillespie>

Before we get started, I want to let you know about a new initiative I'm trying. WhatsApp offers a feature called 'Channels,' which allows anyone to broadcast updates or news links to their followers. There's no commenting, but you can like the posts. I searched for channels related to agriculture, farming, and regenerative practices and found none. So, I've created the 'Realistic Regen Ag' channel. You'll find a link in the description to try it out. If you don't have WhatsApp, the link should direct you to the app store to download it. It functions similarly to text messaging but offers more features, and it's not exclusive to one brand of phone. If you're interested in seeing all the articles I find, rather than just a summary of the top ones each month, check it out.

So let's start with Enhanced Efficiency Fertilizers, or EEFs. These products are designed to stabilize nitrogen in the soil. When nitrogen was cheaper and there wasn't as much pressure to lower nitrous oxide emissions, these fertilizers were not a focal point, except in very specific cases like for potato crops. For potatoes they can help the crop by slowing its early season growth and force it to set and size tubers earlier. In my experience, and according to research from the Prairies, they reduce emissions but rarely affect yield. They are more effective in warmer areas with higher rainfall, but that doesn't necessarily mean they are economically viable here.

There is new research investigating how these fertilizers could be more cost-effective. If the results continue to show consistent benefits, this would align perfectly with my criteria for regenerative agriculture practices: good for the planet and economically sustainable for farmers.

Here's some context: All nitrogen rate trials on crops exhibit a similar rate-by-yield effect. Initially, a small addition of fertilizer linearly increases yield. For example, with no fertilizer, you may get 10 bushels of crop. Add 10 lbs, and it goes up to 20 bushels. Add another 10 lbs for 28 bushels. But then, an additional 10 lbs might only yield 35 bushels. The gains diminish, but if the cost of the fertilizer is less than the value of the additional yield, it's still worth it. This calculation changes based on the relative costs of fertilizer and crop prices.

The key point here is that the efficiency of later fertilizer applications decreases. It takes more fertilizer to produce additional bushels of grain. Most research has focused on using standard rates. What if we reduced the rate, especially since we are using Enhanced Efficiency Fertilizers? The added cost of the EEFs could be offset by a lower rate, potentially maintaining the same yield. This could be a win-win for both the farmer and the planet. I'll be following this research closely.

Next, I want to revisit two stories I've touched on before that are back in the news. Long-term research in Ontario shows that a rotation of corn, soybean, and winter wheat is more profitable than just corn and soybean. Corn yields are consistently higher when winter wheat is part of the rotation. This research has been ongoing since my university days, and its continuation over the past two decades adds more weight to its findings.

Remember, the focus should always be on fundamental agronomy first, then enhancing the system. I'll also link to an article about crop sequence. This research from the Prairies demonstrates how flax is negatively impacted by preceding canola crops. Canola doesn't utilize mycorrhizal networks, leading them to go dormant. Flax heavily relies on these fungal associations, and there isn't enough time to restore them to benefit the crop fully. It's better to have a year with a crop, like a cereal, that isn't as affected by them but will help reactivate the networks. I'm curious if a cover crop after canola might help restore these networks in time for the flax, but so far, I haven't come across that research.

This leads to the next topic: Research in Ontario shows that cover crops are an economic gain in vegetable systems. This makes sense since vegetables don't return much to the soil, and their planting and harvesting processes can be compacting to the soil. In grain-based systems, the only way cover crops could pay would be through some form of additional payment, either for carbon or ecosystem services.

If you're interested in a deeper dive into carbon credits and ecosystem services, I'll link to two podcast episodes from 'Future Ecologies.' One of these, which I helped produce, focuses on carbon credits. The takeaway is that carbon payments are ahead of the science. In the rush to develop a system, the understanding of how things actually work may have been overlooked. Another concept is ecosystem services, which involves assigning a monetary value to the benefits nature provides. It seems promising, but I also have reservations about the science behind it. If you listen to those episodes, please let me know your thoughts by commenting or sending a message through my website, www.plantsdigsoil.com.

One of the best indicators of soil health is soil aggregate stability. Last year, I tried a smartphone app designed to measure this, but it wasn't very effective. I'd heard that the Soil Health Institute was investing in improving the app, and they've announced it is ready now. I suggest downloading the app now so you can be prepared for the upcoming growing season.

You've probably heard me talk about the S-CAP program and the available funding for regenerative practices. One such practice is the use of buffer strips. I'll link to an article about a farmer who has always included them in his farming practices. There are numerous environmental benefits, but there are also practical advantages that farmers and agronomists can appreciate. This farmer has noted the usefulness of having spaces to turn equipment around and for scouting his fields. From personal

experience, I can attest to the convenience of having pathways around fields – what is accessible is scoutable.

I'd like to conclude with an article that raises a challenging question: Should organic farmers be allowed to use conventional 'reset years' when problems become unmanageable? Weeds and fertility issues are common in organic systems. Purists argue for sticking strictly to organic methods, with no recourse to conventional farming. Realists, however, suggest that if we don't allow this flexibility, farmers might abandon organic farming altogether once they encounter insurmountable problems, ultimately reducing the overall land under organic cultivation.

There is already a precedent for using conventional manure in organic farming when organic manure isn't available, as long as it meets certain animal welfare and antibiotic criteria. This doesn't disqualify the land from organic certification. However, using chemicals like Roundup on weeds would. There are exceptions when municipalities mandate control of noxious weeds, but what if a farmer wants to do this intentionally and then apply for re-certification after the transition years? There's a survey linked in the article for you to share your opinions.

That wraps up this month's regenerative agriculture news. Talk to you next time.