Transcript of Episode 017 of the Plants Dig Soil podcast – "The Long View on Regeneration."

Hello! This is Scott Gillespie and welcome to the third season of Plants Dig Soil. In this podcast, you will learn how to think critically about regenerative practices as you work to incorporate them into your agricultural, horticultural, and home gardening systems.

[Transition Music]

In the first episode of the season, I used a story of discovering barefoot shoes to illustrate what I think regenerative agriculture is trying to accomplish. If you have not heard about barefoot shoes, then the easiest way to think of them is shoes without all the engineering and design of the typical athletic shoe. They can come in many levels of minimalism, but most allow the foot to move and flex as much as possible. They are usually flat so that they allow the foot arches to strengthen and do what they were intended to do. I have been using barefoot shoes for two years and never intend to go back to the rigid shoes and boots I used to wear.

From my perspective, the barefoot shoe movement and the pioneers of regenerative agriculture share a common starting point of getting to a point of frustration in the existing paradigm and choosing to go back to the drawing board. Instead of trying to fix a broken system with more technology, they reset the system and watched what nature would do.

However, this does not mean everyone who observes and arrives at a conclusion is correct. Ideas must be tested and allowed to evolve. In both movements, there are people with ideologies that are hard to substantiate. Many times something appears to work initially, only to be proven wrong later. The problem is that hubris can creep in and cause certain people, and those who follow them, to believe so wholeheartedly in the system that they are unable to see anything working in any other way.

That is why, in this episode, I want to take a step back, and take the long view on soils. I will talk about the soil in the area that I live and work in because that is where my knowledge is and that is where I do most of my consulting work. If you are listening from another area, you will need to learn more about the geological and anthropological history of your soil to gain this perspective.

The area that I live is in what we now call the Southern portion of the Province of Alberta, Canada, just north of what is now known as the State of Montana, United States. It has been farmed in the way we know it now for about 150 years. However, it has a long history of human inhabitation and management spanning thousands of years. The Blackfoot Nation resided in this area, and in the vast areas surrounding it, for time immemorial, in what is now Canada and the United States[1].

These soils are incredibly young in a geological timeline. In a human timeline, it is almost unfathomable. The soils in this region are about 10,000 years old. To put this in perspective: If you took every year and condensed it to a day, so we are talking about 10,000 days now, it would take 27 years to see these soils develop. Think of a 27-year span. This could be how long you have been farming; perhaps it is how long you have been married. If you are just starting out farming, you may not even have lived 27 years yet.

However, if you wanted to see these soils develop on a human scale and made every year of development one day, then 27 years is how long you would need to live to see the soils get to the stage that they were at before agriculture. Now when we put agriculture into the picture, you will only need wait another five months. Five months is a typical growing season here: mid-April to mid-September.

Imagine living for 27 years, seeing these soils develop, and then in the span of one growing season watching agriculture completely change them.

If that is hard to fathom, here is another quicker way to think about it. If you took the entire development of these soils and condensed it to an hour, agriculture, as we know it, would only appear in the last minute. And do not forget that these soils are considered young in geological terms. There are soils that are much, much older than these.

As mentioned earlier, agriculture is new in this area but human management is not. The human management of that I am speaking must be thought about in terms of hundreds, or thousands, of years. The changes were at landscape scales. The land management was truly sustainable at that point. The number of people that could live on it was directly tied to what it could give. The people had a close connection to the land. It was a closed system.

It began about three centuries ago that there was a change in the management. The colonists arrived and opened new trade networks. New technology in the form of guns and horses allowed greater harvest off the land than had ever happened before. There was now export off the land as buffalo products were sent to far off areas of the world. For the first time in history, it was not a closed system. Instead of returning to the earth near where it grew, there were instead some things that did not return to it. Over the generations, there were more buffalos taken than could sustain the herd. The change was so gradual that most people did not see the collapse coming.

It is unfortunate how events unfolded. None of us were around in the late 1800's when change accelerated and culminated in the Indigenous Nations being forced into signing treaties and being put on reserves. What is worse still is how the promises made have yet to be fulfilled[2]. However, we can work now to understand what happened and work in the present to make a better future.

[Transition Music]

In this area, the Indigenous populations were mostly based on buffalo but there was a pocket near us that did support agriculture. In what is now the Dakotas, in the United States, there were tribes that practiced agriculture in the bottom land by the Missouri River. They never tried in the lands that we are trying to farm on because it was too hard and dry to be worth their effort.

I found some remarkably interesting parallels to how we farm today.

Buffalo Bird Woman[3] talked adamantly about having to keep up with weeding. Letting them go meant less crop. If she could kill them before they set seed, she would leave them in place. But if they had seed heads, she removed them from her field so they would not cause more problems in the following years.

She was incredibly careful in saving seed. Varieties had been passed down through generations of selection and trading. She knew that you saved the best seed at harvest to plant next year, not what was leftover in the spring. She kept a two-year supply of seed because she knew that years would come when early frosts meant poor seed. She had scorn for the unwise families that did not save as much as she did. She did not share with them. Instead, she sold to them. The price of 65 ears of corn was a tanned buffalo skin.

Fallow was practiced. New fields were opened by clearing the timber on the river flats, digging up the grass, and burning it in place the season before starting to farm it. The first crop was always the best.

The second was never greater than the first but it often equaled it. After three or four years she would rest a field for one or two years in order for it to regain its vigor.

It is estimated that this kind of agriculture developed around the 12th century. It continued to evolve for 700 years until the colonists took over the land, moved the tribes to reservations, and tried to change them to their style of agriculture.

I have another account of one of the first farmers: This one is based in the area in what is now Northern Saskatchewan, Canada, and is made by a colonist by the name of Seager Wheeler[4]. He is most widely known for his prize-winning wheats, but he was also an extraordinarily successful farmer; what struck me about reading his book was his attention to detail.

He sorted out the best seeds from his grain to be planted the next year. He was just as adamant about weeds as Buffalo Bird Woman. He scorned his neighbors for letting them go and not controlling them in newly broken land. When breaking land, he had a similar process as Buffalo Bird Woman. He held the same belief that you needed to start the work in the year before you wanted to produce a crop.

Where he differed from Buffalo Bird Woman was in his belief that there was an inexhaustible supply of plant food in the soil. He believed that with proper tillage he could replace all that the crops removed. He advocated for deeper plowing once the soil was getting too loose and erodible. Bringing up and mixing in a new layer of humus was seen to restore it.

He mentions the actions of bacteria helping to release nitrogen a few times, so I do not believe he thought of the soil as a completely inert substrate. However, he still seems to have been following the theories of the 1700's that believed that you needed to pulverize the soil to a powder to allow the plants to take up the actual particles – that is, the silts and the clays and perhaps the fine pieces of humus or organic matter[5].

[Transition Music]

So, which of these systems is sustainable? I argue that both are destructive to the land. Each farmer admits that the best crop comes in the beginning and that the land slowly degrades over time. The difference is in the time scale. Imagine the tribes moving up and down the river valley for centuries. A site could be used for a few generations and then left for 10 or 20 generations. In that time, it would have a chance to regenerate and could be ready to support a few generations of human habitation again.

We know from the dust bowl times in the 1930's that the system of the colonists was not sustainable. To be fair to Seager Wheeler, he was writing his book near the culmination of his farming career which was a decade or more before it became obvious that the soil did not have an inexhaustible supply of nutrients. As I mentioned at the beginning of this episode – oftentimes something can appear to be working in the beginning, only to be proven wrong at a later time.

I like to keep my episodes to be around fifteen minutes long, so I am going to end the first 9,900 years of soil development and agricultural history back in the early 20th century and pick up the story from there in my next episode. You may be left thinking that there really was not much practical knowledge in this episode, and you are right, in a way. However, I believe that in order to properly regenerate the soil we need to look at the full timeline of its development and what the people that have come before us have

done. It seems ludicrous to us now that tilling soil to a fine powder was a path to an endless nutrient supply, but there are those in the regenerative agriculture sphere that are promising just that same thing – only this time we can get the endless nutrient supply with cover crops.

[Transition Music]

Remember to get local advice before acting upon this information. If you do not know who to talk to, get a hold of me and I will help you find someone. If you are in my local area and need help, contact me. It is always free to chat. If we get to the point that the scope broadens to consulting work, we can work out a plan that fits your budget.

Would you like to keep up with me through a free monthly newsletter? Go to www.plantsdigsoil.com/contact and select the newsletter option. If you have not subscribed to the podcast yet please make sure you do that in your favourite app. If you are a long-time listener – will you consider leaving me a review? This helps others discover the podcast. If you know of someone that would enjoy this, please be sure to share it with them directly or through your social networks.

If you are still listening, you are probably like me and like to know what the catch is. Why am I putting out this information for free? The reason is that I love to learn, and I love to share the information. My knowledge has been built up from experiences in my own garden, advising clients in my consulting business, and from reading the latest books and articles on agronomy and regenerative agriculture.

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.

Nearly everything I talk about is from free resources posted to university and research organization websites. Books that used to be hard to track down are available to buy or borrow for nearly anyone with an e-reader. The information is out there – sifting through it all is what takes the time.

I make my living entirely from consulting. I do not sell any products, software, or systems. I strive to be as independent and as unbiased as possible so I can provide the best advice to my clients and help as many people as possible move from conventional to regenerative agriculture.

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[1] Hugh A. Dempsey. 2015. The Great Blackfoot Treaties.
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[3] Gilbert L. Wilson. 1917. Buffalo Bird Woman's Garden: Agriculture of the Hidatsa Indians.
Full text online: https://digital.library.upenn.edu/women/buffalo/garden/garden.html
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[4] Seager Wheeler. 1919. Profitable Grain Growing. (Not in print but some booksellers have used copies.)
Full text: https://www.canadiana.ca/view/oocihm.991508/8?r=0&s=1

[5] University of Minnesota Extension. 2017? Upper Midwest Tillage Guide
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