

Transcript of Episode 007 of the Plants Dig Soil podcast – “Plants as Soil Amendments”

[Intro Music]

Hello! This is Scott Gillespie and welcome to the second season of Plants Dig Soil. In this podcast, you will learn ways to transition from conventional to regenerative practices in agricultural, horticultural, and home gardening systems.

[Transition Music]

Some of you will be thinking – I don’t remember the first season. In fact, I don’t remember subscribing to this podcast! That’s because it has a different name now. I had called it “Helping Plants to Help Your Soil” but I always found it wordy. Also, the title gets cut off in a lot of podcast apps. Over the Christmas break, this year “Plants Dig Soil” came to me and it made so much more sense. I quickly checked the domain name, it was available, and so I reserved it right then and there.

What do you think of when you hear Plants Dig Soil? Email me – scott@plantsdigsoil.com or message me on Twitter or LinkedIn. Links will be in the episode description.

On to the first topic of the year – Plants as Soil Amendments. This was supposed to be a presentation at a Seedy Saturday event in Lethbridge, Alberta, Canada put on by a local group called Environment Lethbridge. Seedy Saturday events are organized independently by local community organizations to allow gardeners to exchange seeds, listen to some talks on gardening, and exchange ideas with others. However, as with most events this past month, and for the foreseeable future, it was cancelled. I’d still worked on my presentation and wanted to get the information out there so I thought I’d adapt it to podcast form and post for everyone to benefit from.

So let's get into it.

When most people think of amendments for their garden they think of bringing something in from the outside. There are two basic types: One is a biological amendment that brings some type of organic matter to the soil, such as animal manure. The other type is something that changes the chemical structure of the soil; an example of this is lime to raise the pH.

These shouldn’t be confused with organic and conventional agriculture. Organic agriculture is a system that doesn’t use synthetic inputs. It can still use chemical inputs as long as they are natural. Bt is a chemical that is created by bacteria and that is permitted to be used because it is created by natural processes. Likewise, conventional agriculture uses organic amendments along with synthetic inputs.

Biological and chemical amendments work together to change the physical nature of the soil to help plants to root better and gather more nutrients. It also helps the microbes to function better by getting more gas exchange – carbon dioxide and oxygen.

Gardeners are accustomed to picking up these amendments from their local garden centre and adding them to their soil. We forget about the long supply chains that it takes to get these

amendments to us. We can't continue to take it for granted that we will just be able to pick these up. If the amendments aren't local, they may have travelled thousands of kilometres to get to us. The fuel alone is a large source of carbon. But let's think even further back through the chain.

If you buy a bag of sheep manure, where did it come from? It didn't come from a farm where sheep graze out on pasture. No one can collect manure from there. It had to come from a farm where sheep are kept in a barn. Where did the feed come from? It had to come from being grown on a field. This field may be nearby but it also could have been thousands of kilometres away. Now think about that field. This food was exported from the field and animals and their manure was not returned. Nutrients must be replaced. Where did those nutrients come from?

If you want to dive deep into this, I suggest you read through a series of articles from Andy McGuire¹. He's the one that got me thinking through this and has done a wonderful job in putting numbers to the nutrient and carbon flows. The links for the articles, and any other resources mentioned, will be on the transcript of this podcast posted to my site. This will also be in the episode description.

Imported amendments aren't bad as long as you understand the carbon footprint and the journey that they have taken. In my own garden, I use compost that I make by collecting local leaves and combining them with vegetable scraps from my kitchen. Around my trees, I use wood chips that my town allows residents to pick up for free. These wood chips come from residents as they trim or cut down trees and from the employees of the town as they maintain local parks.

I'm still a part of transporting nutrients because the leaves, wood chips, and vegetable scraps (except for those that are grown in my garden) all rely on nutrient replacement from an external source. I delved deeper into this last year so if you want to learn more check out Episode 002² from last season.

What if you don't have a local source? Or for me – what if this source isn't available to me? The town is running its own compost system now so if it decides that all waste needs to go through its system I may not have access. Or, if everyone realized the value of their wood chips and leaves I wouldn't have any available!

This is where plants come in. The shoulder seasons are excellent times to have something that is cold tolerant and can grow when none of our vegetables can. From harvest to winter freeze and again from thaw to planting, there is a tremendous opportunity.

Since this episode is covering a local topic, I'm going to cover only those species I have experience with and are locally available. Or at least *were* locally available. I was able to get the seeds last year from nearby garden centres and the seeds were also available from online sources that originated only a province away. This coming year may have a greater challenge if supply chains are interrupted.

I am fortunate to have enough leftover seed for this year, along with some seed from local farms that I've consulted with. I encourage you to start looking for the seed now so that you are ready to plant in the summer. Yes – the summer. Listen to Episode 006³ to learn more about what I did to establish cover crops early so that they maximized their growth in the fall and early winter.

The first soil-building crop I want to cover is fall rye. In the United States its commonly called cereal rye. It is an absolutely amazing plant. One year I planted it in mid-October, a month after our typical killing frost, and it grew! There was snow after I planted it and I didn't see much until mid-November when it melted. I could find germinated seeds below the ground. After another snow in November and a thaw in December, they were out of the ground! In March they were already growing into the snow as it melted away. This is a pretty common experience among farmers.

Ideally, it's planted much earlier than that so it has more time to grow and hold the soil in place but it shows just how hardy it is. Too much growth can be a problem so you don't want to plant it too early.

The claim to fame for fall rye is its allelopathic effects. It creates its own herbicide to inhibit the germination of plants nearby. This makes it both a good choice and one to be cautious about. I have found that as long as it's killed and the ground is slightly disturbed where I plant my vegetable crops it is totally fine. Soybean growers have been successful in letting it grow to heading, crimping it to the ground, and planting directly into it.

The best way to use it for your garden is as a late-season soil stabilizer and weed inhibitor. In spring it's best to kill it early, whether by mechanical or chemical means. I learned the hard way that it grows a massive amount of roots quickly and can be a nightmare to manage once it gets over 15cm or 6" tall.

The second soil-building crop I want to discuss is hairy vetch. It is a cold-hardy legume that can help to add nitrogen to your soil. As it grows well in cold weather it is a good erosion preventer and weed suppresser as well. The big caution with hairy vetch is that there can be hard seed. This means there can be seed that will not germinate when planted. Some seeds are genetically programmed to wait a few years. This is not genetic modification. This is a completely natural trait that is a part of this species. Due to this, hairy vetch can become a weed if it gets out of hand on you. If you manage your garden well and control weeds quickly it shouldn't be a problem.

My first experience with it was this past fall. I planted it between my vegetable rows in June along with many other soil crops. They all established and didn't grow much until harvest, which was the intention. Even though the fall was short and cool the hairy vetch thrived. It was 30cm (12") tall when 60cm (24") of snow came in late September. It was flattened, but two weeks later when the snow had melted and we returned to non-freezing temperatures it continued its growth.

This past January there was about 15cm (6") of snow on top of the ground when the high temperature dipped to -25C (-13F) for about a week. After this, we had 2-3 weeks of temperatures above freezing, which is common for our area due to our proximity to the Rocky Mountains. I found new growth on the plants!

Having cold-tolerant crops that can overwinter, or at least have the potential to overwinter, is very important in a short growing season area like I live. As long as they can be managed before planting the vegetable crop this maximizes the time that the soil crop can do its job.

The last plant I want to feature is mustard. It will winterkill in my area but it can tolerate some frost. Mustards are known to suppress diseases in the soil. In cases where potatoes have been grown too often, they can be used as a green manure that is tilled into the soil

Where it fits in well is as a part of a mix of seeds. Fall rye, hairy vetch, and mustard can all be planted together where each will give some benefit to the soil. If you have a problem that is best solved with just one I'd advise you to use that one exclusively. If your soil is in good shape and has no particular issue a mix helps to maintain the soil. It also gives some resilience to the soil crop. In years where one crop is favoured or even particular places in the garden, that crop will thrive. If planting one crop and it doesn't do well in an area you just end up with a bare spot.

So there you have it. Three plants that you can start using this year to help amend your soil. There are dozens more, if not hundreds, that can work well in your garden, but you've got to start somewhere. Do you have a plant that you love and you think I should have covered? Email me or send me a message through social media. My email once again is scott@plantsdigsoil.com and my social media links can be found in the description of this episode.

Don't forget to start looking for these seeds now, not when you need them. The great thing about seeds is that they keep for years and they don't take up much space. Once you get seeds you like you can start to learn how to save some of them so you always have your own supply. I know I'm going to start learning how to save seeds. I dabbled in it a bit this past year but I'm going to put more effort into it this year.

[Transition Music]

Remember to get local advice before acting upon this information. If you don't know who to talk to, get a hold of me and I'll help you find someone. If you're in my local area and are in need of help, contact me. It's 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're still listening you're 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 farmers and agronomists 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 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 ereader. The information is out there – sifting through it all is what takes the time.

I make a living entirely from consulting. I don't 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.

[Outro Music]

¹ Andrew McGuire. "There is not enough manure (or compost) to sustain agriculture"
<http://csanr.wsu.edu/not-enough-manure-to-sustain-ag/>

² Scott Gillespie. "002 How I Build Health Garden Soil"
<https://www.plantsdigsoil.com/podcast/002-how-i-build-healthy-garden-soil>

³ Scott Gillespie. "006 Lessons Learned in 2019"
<https://www.plantsdigsoil.com/podcast/006-lessons-learned-in-2019>