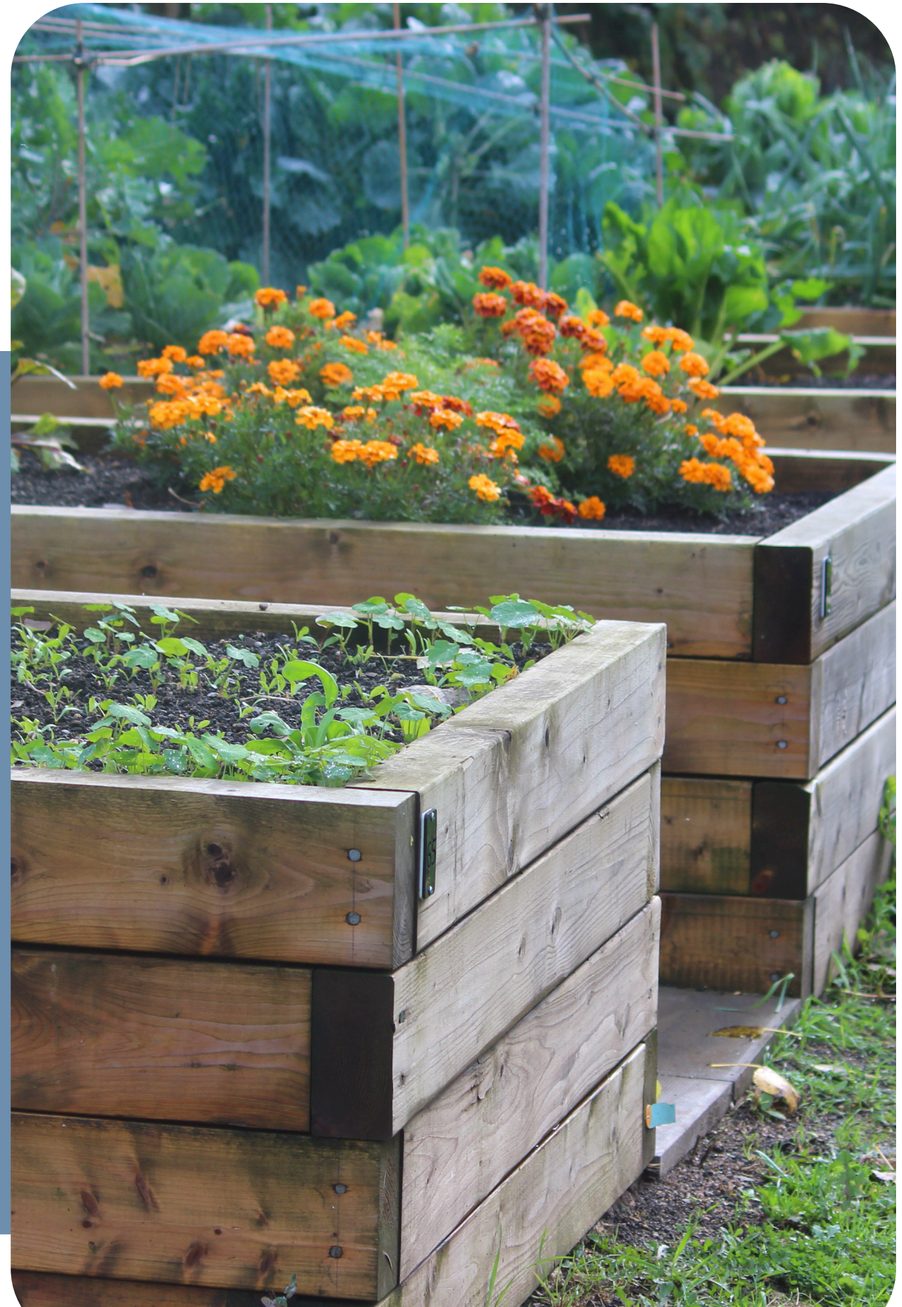
GARDEN TRIALS

Regenerative Organic Oats (ROO)
Learning Series

Canadian Organic Growers
Cultivons Biologique Canada

WHAT TO EXPECT FROM THIS RESOURCE

In the early months of 2025, the Regenerative Organic Oats (ROO) program hosted a series of virtual gatherings that created farmer-to-farmer learning opportunities focused on key topics in regenerative organic agriculture. This resource shares the experiences, insights, and advice of ROO farmers on garden trials, highlighting their unique experiments that tested out certain regenerative organic practices. Explore this resource to gain first-hand insights into real-life scenarios and discover how garden trials might be a perfect fit for your own context.



A SPACE FOR LEARNING AND EXPERIMENTATION

Garden trials offer an opportunity to apply a regenerative mindset through experiential learning: learning by doing, observing, and reflecting. These trials provide a hands-on space to test and explore ecological approaches in food or ornamental gardens, offering insight into how techniques might function at a broader field scale.

WHY START A GARDEN TRIAL?

By starting small, it becomes easier to manage more variables with less risk. Garden trials help control resource use (i.e., time, tools, seeds, amendments) while still yielding meaningful insights. Their smaller scale makes them easier to manage and less overwhelming, offering a more practical and flexible space to experiment without the pressure or potential cost of full-scale implementation. Trials can also spark curiosity, which invites new questions and observations.

A WILLINGNESS TO LEARN

Approaching trials with a regenerative mindset means being open to learning, adapting, and questioning. It is not just about what works, but about observing interactions, welcoming surprises, and embracing complexity.

GARDEN TRIAL CONSIDERATIONS

A good trial begins with a clear question:

- Are you exploring *why* a process works the way it does?
- *What if* you shift a method or input?
- *When* or *how* often should something be done?

Maybe you’re comparing different ways of doing the same task. Defining the question helps shape the observation and monitoring approach.

GARDEN TRIAL SCALES

To stay manageable, trials should be scaled to what is realistic in terms of time and capacity. It is also important to recognize that what you observe may not always be tied to a single cause. Repeating a trial under different weather or rotational conditions can help test consistency. Monitoring tools or techniques should be simple enough to use reliably and allow you to track change.

EXPECT THE UNEXPECTED

Equally important is staying open to the unexpected. Some of the most valuable insights come when outcomes do not align with expectations. Even when a trial does not “work,” it still provides direction. And sometimes, the results are better than anticipated. Either way, garden trials offer a space to experiment, reflect, and grow.

EXAMPLES OF GARDEN TRIALS

- Use of living or dead organic material to extend soil cover.
- Inclusion of multi-species plantings to evaluate effects on biodiversity and crop interactions.
- Comparison of disturbance types, timing, and intensity to assess impacts on weed pressure and soil function.
- Evaluation of equipment modifications and small-scale implements for garden use.
- Assessment of nutrient amendments and their influence on plant growth and soil response.
- Testing of monitoring tools and observation intervals to track changes in soil or crop performance.

WHAT ROO PRODUCERS ARE DOING

The material discussed in the following slides was compiled in a producer-centric gathering in Spring 2025.

In these slides, we share the perspectives of ROO farmers regarding their experience with garden trials and how they have adapted their farm management based on their learnings, successes, and challenges.

Each farmer’s context is completely unique and emphasizes the necessity to apply changes within your own management based on your own context.

WHAT PRODUCERS ARE DOING:

HEPBURN, SK

ROO participants from Hepburn, SK are combining mulch management with cover cropping to reduce hardpan. They established a no-till garden nine years ago, which revealed a persistently compacted layer roughly six inches below the surface. This layer limited root development despite repeated compost and manure applications.

They trialed various mulch strategies over time, rotating between straw and wood chips. In 2025, a garden-specific cover crop mix is being seeded to help break up compaction, supported by the regular use of vermi-compost and compost tea as part of the in-season fertilization program.

WHAT PRODUCERS ARE DOING:

SASKATOON, SK

A ROO participant is using foliar feeding and deep-rooted cover crops to support soil biology. He is using foliar phosphate applications to improve early growth and soil structure, and he is observing increases in root exudation and microbial activity.

Deep-rooted species (including sweet clover, tillage radish, and tillage turnip) are being trialed to reduce subsurface compaction and enhance biological function in the root zone.

WHAT PRODUCERS ARE DOING

BIRSAY, SK

A ROO participant from Birsay, SK is broadcasting a diverse seed mix using a low-input “chuck-it” method. He trialed a “chuck-it” style garden by broadcasting a mix of older garden seeds across a mulched plot in late June using a lawn spreader.

Despite weed pressure and a short growing window, the garden produced tomatoes, beans, pumpkins, and zucchini.

The plot had previously been a flower bed with deep, decomposed wood chips, which likely supported fertility. He is repeating the approach to assess consistency.

INTEGRATING LIVESTOCK IN A GARDEN SETTING

Livestock can be integrated into garden trials to cycle nutrients, manage residue, and add organic matter. One approach is to use chickens seasonally with a portable infrastructure, such as chicken tractors or electric netting. Birds can be rotated through selected areas or kept in a fixed location near garden beds.

COMPOSTED MANURE

Another option for integrating livestock without bringing animals directly onto the land is to apply composted manure. Manure can be delivered and spread in the fall, allowing time for decomposition before spring planting. When applying composted manure in small garden systems, it is important to consider the potential for nutrient imbalances. Over-application (particularly of composted animal manures or green waste) can disrupt nutrient cycling, affect crop performance, and alter soil structure. If growth is uneven or unexpectedly low, assessing soil nutrient distribution and comparing plant responses between transplants and direct-seeded crops may provide useful insight.

TERMINATING CROPS WITH LIVESTOCK

Livestock can also be integrated into termination strategies. Grazing plant residue at the end of the season can help return nutrients to the soil, stimulate root exudation, and increase surface biomass. This can be especially useful in systems managing high nitrogen or phosphorus levels, where additional carbon may help buffer nutrient excess. Different animals offer different termination intensities and options. For example, goats will graze down more woody materials and pigs can really turn over and root up soils.

USING VERMICOMPOST TO SUPPORT MACRO-LIFE

Vermicompost is one approach that can be trialed to promote macro-life diversity in garden systems. Worm bins are kept indoors over winter with castings applied during spring seeding, either mixed directly with seed or added to beds. Remaining material from the bins is added to the compost pile. Over time, this practice has been linked to increased earthworm activity and the return of visible soil organisms such as nematodes, spiders, and other arthropods.

INCORPORATING FISH EMULSION INTO FOLIAR FEEDING STRATEGIES

Fish-based foliar applications can be explored as an alternative fertilizer strategy in garden or crop systems. A common blend includes fish emulsion, magnesium sulfate, boron, fulvic acid, and seaweed extract to raise sugar levels and stimulate root exudation. As one ROO producer puts it, this is essentially “gasoline for microbes”.

HOW TO USE FISH EMULSION

Fish emulsion can be sourced from a local fish processing facility using waste material and should be screened before use to reduce the risk of clogging. Applications may be diluted with water and applied at rates up to 15 gallons per acre (approximately 68 litres per acre). Higher dilution improves coverage and foliar absorption. A boomless nozzle sprayer is commonly used for field-scale applications, covering up to 105 feet in width. For garden-scale use, the same blend can be applied with hand sprayers or hose-end applicators.

FISH EMULSION CONSIDERATIONS

Unfiltered materials or non-micronized minerals may clog nozzles. Diluted biological inputs can also lead to biofilm buildup in tanks or lines if not cleaned regularly. When scaling up foliar spray practices, it is important to confirm that all ingredients meet organic certification requirements. Producers working in certified systems should verify product approval with their certifying body before use.

USING STRAW MULCH FOR GROUND COVER AND BED BUILDING

Using straw mulch is one approach to establishing ground cover without tillage. Seeds or seedlings are placed directly on the soil surface and covered with straw. At harvest, the straw is pulled back and crops are collected. This method can be paired with building permanent beds by moving topsoil from adjacent paths onto the growing area to increase depth. Cardboard and wood chips may be used in the paths to suppress weeds and define bed structure. Straw with slower breakdown rates (i.e., flax or other dense materials) is often selected to retain moisture and suppress weeds over an extended period.

USING MINERAL INPUTS: GYPSUM AND GSR CALCIUM

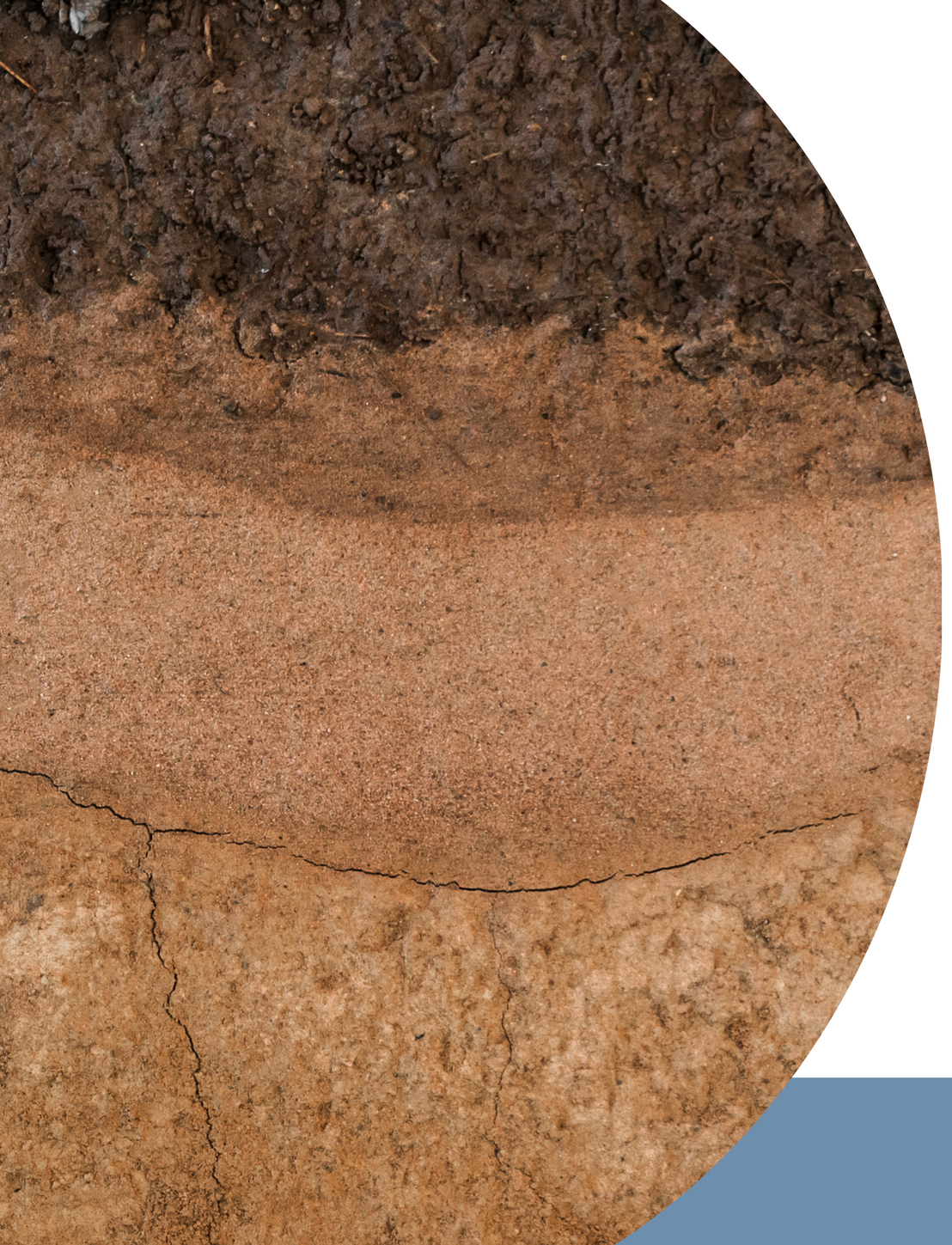
Mineral amendments can be trialed in garden or field settings to address specific nutrient imbalances or soil structure concerns. When applying insights from garden trials to field-scale use, it is important to ensure that soil conditions and context are comparable.

GYPSUM

Gypsum is a mineral amendment made from calcium sulfate. It provides plant-available calcium and sulfur without significantly affecting soil pH, making it a useful input in systems where nutrient correction is needed without raising pH.

HOW DOES GYPSUM HELP?

Gypsum can help address nutrient imbalances that can develop with repeated manure applications, particularly when potassium and phosphorus levels become elevated. High potassium can interfere with calcium uptake in plants, and excess phosphorus can throw off the ideal phosphorus-to-sulfur ratio, which is generally considered to be 1:1. Gypsum supplies calcium to help offset potassium-driven calcium deficiency, and provides sulfur to help balance high phosphorus levels.



GYPSUM AND FLOCCULATION

The sulfur in gypsum also supports flocculation, which is a process that helps separate clay particles and improve soil structure, especially in compacted soils. While not always consistent in its effects, gypsum is also sometimes used to help manage high sodium levels in soil. Testing sodium levels can help determine whether gypsum is an appropriate input.

GYPSUM IN ACTION

Gypsum has been trialed at field scale by applying rates up to 900 pounds per acre, including in potato and barley systems. In one example, potatoes were followed by hemp, and producers observed a notable improvement in crop performance compared to the rest of the field. Results with barley have been mixed — effective in some cases, but not always consistent year to year.

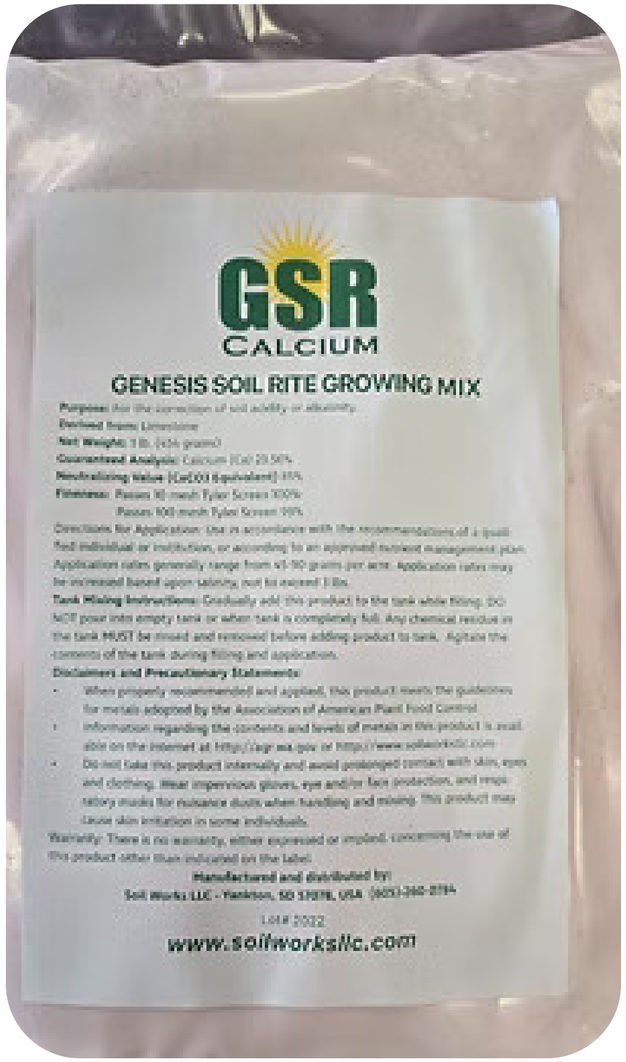


Photo credit: https://www.highbrixmanufacturing.com/product-page/1lb-dormant-gsr-calcium-1

GSR CALCIUM

GSR Calcium is a calcium product made from micronized limestone, specifically calcium silicate. It gained popularity through consultant networks and publications like Acres U.S.A. as a mild liming material.

The product is applied at very low rates and diluted heavily, often over multiple passes. It was trialed by organic producers in Ontario who were persistent over a few seasons, but ultimately did not observe any consistent or measurable benefits.

WHY GSR?

The idea behind GSR is to micronize calcium, which is a cation that is notoriously difficult to get into solution. Micronization is intended to keep calcium suspended in solution and more readily available for plant uptake. By micronizing it, GSR can be applied in diluted form and used to raise pH in low-pH soils. In addition to calcium, GSR also supplies silica, which is considered beneficial for strengthening plant cell walls.

MONITORING TO ASSESS IMPACT OF MANAGEMENT

Soil health monitoring in garden systems offers an opportunity to observe how biological, chemical, and physical conditions respond to different management practices at a small scale. Consistent monitoring helps track changes over time and assess the impact of those decisions.

CONSIDERATIONS DURING MONITORING

- Penetrometer readings, for example, are sensitive to soil moisture. Compaction may appear lower in wetter soils, which can make it difficult to compare one reading to another over time unless conditions are the same.
- Using an unmanaged or undisturbed area as a reference point provides valuable context, especially in smaller garden trials where variability across space or time may be more pronounced.
- Establishing a control or baseline improves interpretation and helps clarify whether observed changes are due to management, weather, or other factors.

APPROACHES TO GARDEN CROP TERMINATION

Garden trials offer a practical setting to experiment with different crop termination methods and observe how they influence soil structure, residue management, and biological activity. Termination options to trial include mowing, weed trimming, or roller crimping. These leave plant residue on the soil surface which maintains ground cover, prevents seed set, and helps regulate moisture and temperature.

TERMINATION CONSIDERATIONS

- In garden settings, simple tools like a weighted board with ropes can be used to crimp effectively at a small scale.
- Leaving roots intact allows soil biology to keep functioning. There cannot be microbes without plants – active roots drive that system. Root exudates and microbial residues help bind soil particles, build structure, and improve airflow and water movement.
- Tilling in green material can speed up decomposition and nutrient release, but surface termination tends to preserve structure and biological activity for longer. The choice depends on what you are trying to shift, protect, or prepare.

REFLECTIONS AND TAKEAWAYS

The garden often falls to the bottom of the priority list when other demands take over. But the garden feeds us and deserves the same care we give to our fields. It can also serve as a starting point for observing, learning, and improving broader management practices.

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THANK YOU FOR READING!