

Advancing Eco
Agriculture



The Regenerative Soil Primer

Resource Guide &
Grower Results



AEA's Mission

We are committed to developing regenerative agriculture systems that improve soil health, cultivate resilient crops resistant to diseases and insects, and achieve such exceptional quality that we can have a legitimate conversation about growing food as medicine. It's our mission to have these regenerative agriculture systems become adopted globally and become the mainstream—the status quo against which all other growing systems are compared.

AEA's Five Core Concepts



1. Healthy plants resist insects and disease

Animals and people have immune systems for defense against pathogens and physical stressors. The same is true of plants. When nutrition is poorly balanced, plant immunity is compromised, but when optimized, plants can improve immune resistance against insects and disease.



2. Mineral nutrition supports plant immunity

To enhance immunity, plants create higher-order compounds through multiple enzyme systems, many of which require trace minerals to function. Without these mineral cofactors, enzyme pathways collapse and incomplete metabolites accumulate, creating a food source for pests that leads to infestation and reduced plant health.



3. Microbial metabolites are a more efficient source of nutrition

Plants absorb nutrients most efficiently as microbial metabolites. A complex community of soil micro-organisms serves as the plant's digestive system, breaking down organic residues and root exudates. Minerals extracted from the soil matrix are then released in bioavailable form allowing plants to utilize them more efficiently than simple ions from fertilizer in solution.



4. Quality drives yield

Regenerative agriculture begins by improving plant health. As plant nutrition improves, energy and immunity of crops increase, creating higher yields, better shelf life, flavor, and reduced dependence on pesticides. As quality increases, yield can't be stopped from following.



5. Healthy plants create health soil

While healthy soils can create healthy plants, the reverse is also true. Healthy plants send much of the sugar they produce into the soil as root exudates. This in turn fuels soil microbial metabolism which releases carbon from photosynthates back into the soil environment, efficiently building soil organic matter.



“The reward is going out there and digging and finding mycorrhizae in your soil. That’s one of the rewards, ‘Man, we’re actually doing it!’”

— *John Bays*

J&V Bays Farm

Regenerative Soil Primer

AEA’s Regenerative Soil Primer unleashes the biology that can provide the nutrients needed for crop quality and increased disease resistance.

Soil primer can help:

- ✦ Digest crop residue
- ✦ Boost microbial populations
- ✦ Increase cover crop success
- ✦ Decrease chances of overwintering disease

Soil primer provides the food and shelter needed for soil biology to do its work all winter long, priming the soil for a more productive crop the next year. It is the first step in creating a regenerative system, putting more energy into the soil than is taken out.

Soil Primer consists of three key ingredients:

- 1. Rejuvenate™** helps build an environment in which microorganisms can flourish by supplying the structure and energy they need to thrive.
- 2. SeaShield™** supports healthy fungi by providing phosphorus, calcium, trace elements, amino acid nitrogen, fats, and oils.
- 3. Spectrum™** is a soil inoculant that enhances and restores beneficial soil microbe populations.

Soil Primer:

Rejuvenate™

Broad spectrum nutrition for soil biology

Why Use?

Rejuvenate™ provides everything that soil microbes need to thrive. It is designed to provide the commonly missing resources needed by soil bacteria, which are the foundation of the farm ecosystem. Rejuvenate™ ensures a successful inoculation event, establishing microbes in all manner of conditions. It can help build up microbial populations in the soil to a point where they can rapidly digest crop residues, thus releasing tied-up nutrients for the following crop.



Features and Benefits

- ✦ Builds an environment in which microorganisms can flourish
- ✦ Acts as a catalyst for the creation and breakdown of proteins
- ✦ Helps crop residue decompose faster, reducing the potential of overwintered diseases
- ✦ Promotes faster release of soil mineral reserves
- ✦ Aids micronutrient uptake
- ✦ Increases soil calcium availability

Key Ingredients

- ✦ Molasses
- ✦ Seaweed Extract
- ✦ Desalinated Sea Water
- ✦ Humic Substances

Application Rates and Timing

- ✦ **In Soil Primer:** 1-2 gallons per acre
- ✦ **Row Starter:** up to 6 quarts per acre
- ✦ **On Cover Crops (prior to incorporation):** up to 2 gallons per acre
- ✦ **On Crop Residues:** up to 3 gallons per acre
- ✦ **Fruits and Vegetables:** up to 5 gallons per acre

Soil Primer:

SeaShield™

Critical support for plant immunity and thriving soil fungi

Why Use?

SeaShield™ is an essential part of a balanced nutritional program for plants and soil. It enhances plant vigor and resistance to pests and pathogens. SeaShield™ works especially well when combined with other AEA nutritional formulas and is one of the three products in our cornerstone Soil Primer application.



* SeaGuard™ is available as a non-NOP compliant SeaShield™ that is only available in 275-Gallon totes.

Features and Benefits

- ✦ Provides support during crop stress
- ✦ Supports soil fungal populations
- ✦ Promotes lipid production in plants, which results in leaves with a waxy sheen and increased resistance to pests and pathogens
- ✦ Helps plants develop strong cell membranes that aid in resisting disease and insects
- ✦ Supports plant immune responses to a broad array of fungal and bacterial organisms

Key Ingredients

Mechanically cold-processed:

- ✦ Micronized crab shell
- ✦ Micronized shrimp shell
- ✦ Fish protein hydrolysate derived from ocean-caught fish by products

Application Rates and Timing

- ✦ **In Soil Primer:** 1-2 gallons per acre
- ✦ **At Planting:** up to 2 gallons per acre
- ✦ **Foliar:** up to 2 gallons per acre every 2 weeks
- ✦ **Fertigation:** up to 5 gallons per acre every 2 weeks, up to a maximum of 100 gallons per acre per year

Soil Primer: **Spectrum™**

Brings soils back to life

Why Use?

Spectrum™ is a soil inoculant to enhance and restore beneficial soil microbe populations. It is a critical component of AEA's Soil Primer application.

There are four different products in the **Spectrum** line:

- ✦ Spectrum™
- ✦ Spectrum DS™: better for drought-stressed soils
- ✦ Spectrum PSB™: better for soils with low phosphorus or bound-up phosphorus
- ✦ Spectrum+Myco™: a convenient combination of Spectrum™ and MycoGenesis™



Features and Benefits

- ✦ Breaks down and releases vital nutrients stored in soil particles
- ✦ Makes nutrients more readily available to the plants in forms they can absorb
- ✦ Speeds up the decomposition and recycling of organic matter

Key Ingredients

- ✦ Beneficial microorganisms: Plant growth promoting rhizobacteria (PGPR) and plant growth promoting organisms (PGPs)

Application Rates and Timing

- ✦ Spectrum™ and Spectrum DS™: 50 grams per acre
- ✦ Spectrum PSB™: 75 grams per acre
- ✦ Spectrum+Myco™: 155 grams per acre





Decreased Nitrogen Use

Conversation with John Kempf and Dennis Paschovitz, a canola grower in Saskatchewan, Canada

J “Dennis, can you tell us a little bit about what you did, treated and untreated?”

D “On the left is the way I conventionally farm with high inputs. I put 160 lbs of nitrogen on last fall and top dressed this spring with another 60, phosphorus around 50 lbs, 30 lbs of sulfur, and sprayed with fungicide. On the other side we used the AEA program. We put down 100 lbs of nitrogen in the fall, but no additional top dressing, so this has 60 lbs less nitrogen than the other side. As well, I did not put any fungicide on the right hand side. It looks quite healthy at this point.”

J “It’s obviously still too early to tell yield, but are there any observable plant differences at this point?”

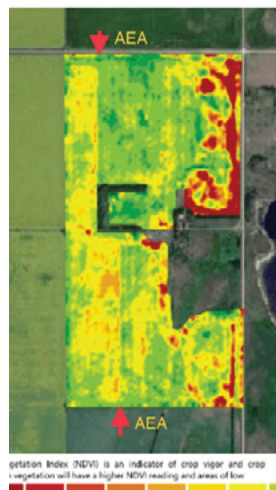
D “Yeah, one of the big things that a guy looks for is the color, the darker green the better. The AEA product side is a darker green, which is surprising because usually we use nitrogen to get it as dark green as we can. Where I put more nitrogen it’s actually not quite as green which was a surprise to me. On the AEA side, if you look it’s probably at least 8 to 10 inches taller. It flowered longer, which will produce more buds and more yield. As well, I get NDVI reports every



week and you can see a distinct difference on the NDVI between the two sides.”

J “What do the differences look like on the Normalized Difference Vegetation Index (NDVI)?”

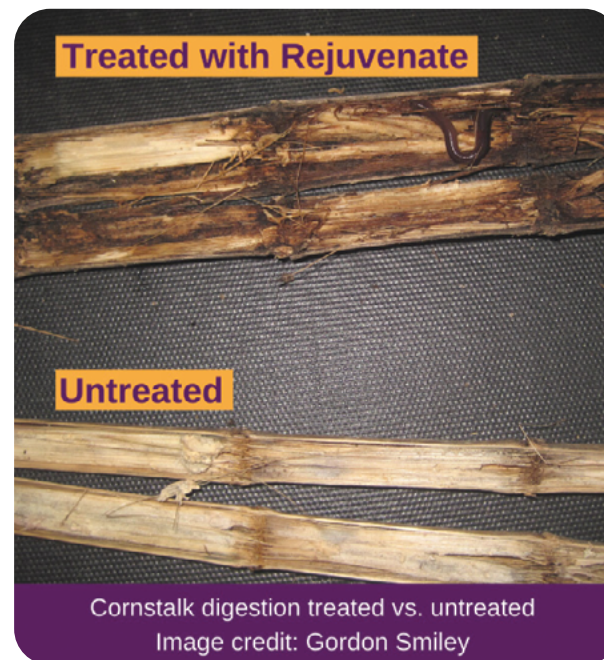
D “You can see the distinct line in the color in the field. I do have a weigh wagon, I can weigh the two sides [at harvest] and find out exactly what it is and I’ll have yield maps too.”



Increased Residue Digestion

When crop residue isn’t properly broken down and assimilated into the ground, it can harbor diseases that will carry over to next year’s crop. This year, make sure you are keeping that valuable nutrition and carbon on your farm in the form of stable humic substances by developing microbial populations to digest the residue and convert it to stable organic matter.

Some growers apply soluble nitrogen products to help break down crop residue by addressing the carbon-to-nitrogen ratio. However, without adequate levels of sulfur and proper microbial digestion, the carbon and minerals contained in the plant are oxidized and burned off into the atmosphere as CO₂.





Decreased Soil Compaction

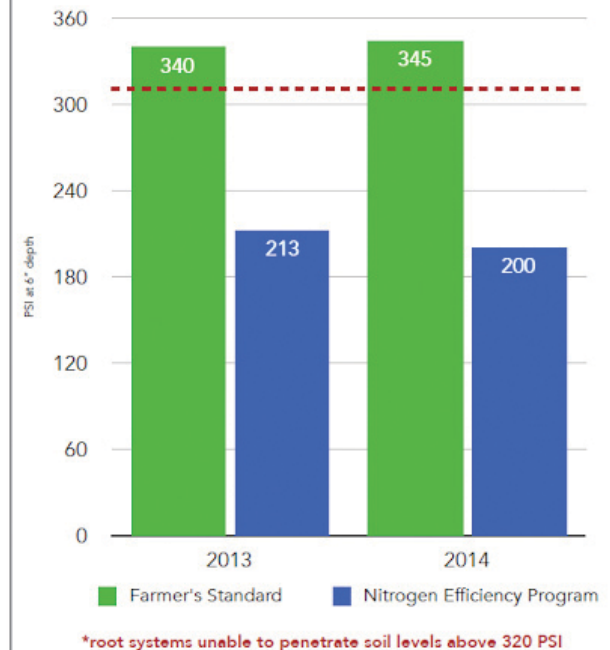
Compaction can cause problems for a crop that result in low vigor and yields. Contrary to popular belief, compaction does not always come from heavy equipment and tillage, but rather from an

improper calcium-to-magnesium ratio, and from low levels of microbial activity. When these two points are addressed, the soil becomes crumbly and porous.

Gordon Smiley - Greensbrug, Indiana

Soil Compaction Down 29% in One Year

The Regenerative Soil Primer was started in 2013.



"After applying the Regenerative Soil Primer, the soil structure on my heavy clay soil has changed to crumbly and mellow and forage quality and yield has drastically improved."

— Toby Baldauf,
Pennsylvania



Get Started

“The solution to mineral deficiency is to solve the lack of microbial populations and increase their health and vigor.”

— John Kempf


To get started with the Regenerative Soil Primer, reach out to our Customer Care Team. Place your order for the Regenerative Soil Primer and learn more about how you can work with other Advancing Eco Agriculture products and our consulting services. This will help determine the biological inoculant best suited for your soil and product application ratios and frequency.

Call our Customer Care Center

800-495-6603, ext 344

or email us at

hello@advancingecoag.com



“I initially thought the AEA Soil Primer was expensive, but when you get to the end of the season and see what other inputs you saved, you see the return on investment”

— James Johnson,

Carzalia Valley Produce Inc.



Program FAQ

What's included in the Regenerative Soil Primer?

This program consists of one or more soil applications of [Rejuvenate™](#), [SeaShield™](#), and [Spectrum™](#) or, if called for, another biological inoculant like [Spectrum DS™](#), [Spectrum PSB™](#), or [OP-8™](#).

Will this program take the place of my current nutrient program?

No, this program enhances almost any fertility practice, but is not a stand-alone fertility program in most instances. The materials in this program are compatible with most agricultural inputs, though care should be taken to avoid practices that may diminish microbial activity.

How will I know if this is right for me?

This program is designed to improve the soil condition and nutrient efficiency of all soil types by increasing helpful microbial populations and vitality. It is especially beneficial on soil and crops experiencing compaction, soil-borne disease, poor mineral availability, and limited biology. Rates and timings will vary, talk to a member of the AEA team for more information.

How often do I apply?

For fall harvested commodity crops, one application in the fall is typical. For vegetable crops, an application before each succession planting is ideal. For high value specialty crops, multiple applications can lead to higher marketable yields and better quality. This could mean both spring and fall or making repeated applications through fertigation. The more challenges to biology or “steps back” your practices involve, the more likely you benefit from repeated applications.

How much does it cost?

Depending upon soil and market conditions, growers typically spend between \$50-\$85 per acre for an annual application. Remember, this decreases costs elsewhere, and the benefits are spread out over multiple years. It is not just an annual input, but is the basis of a long-term regenerative investment in your operation.



Learn more about the
Regenerative Soil
Primer



Learn more about
Regenerative
Agriculture

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