Advancing Eco Agriculture

Products and Services Catalog

Contents

What is Regenerative Agriculture?

Regenerative agriculture is a way of farming that regenerates soil health, plant health, animal health, and human health.
It works by harnessing life's systems to:

- Bring soil back to life
- Improve crop quality
- Grow more nutritious food
- Use fewer synthetic inputs
- Reduce harmful toxins
- Improve farmers' quality of life.

Regenerative agriculture's approaches are unique to each time and place. They're focused on producing measurable, quality outcomes. Our vision for regenerative agriculture is to grow vibrant and abundant food without the need for chemical fertilizers and pesticides.

AEA's Mission

We are committed to developing regenerative agriculture systems that improve soil health, produce crops that are resistant to diseases and insects, and produce crops of such an 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. Mineral nutrition supports plant immunity

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

2. 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 attain immune resistance against insects and disease.

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

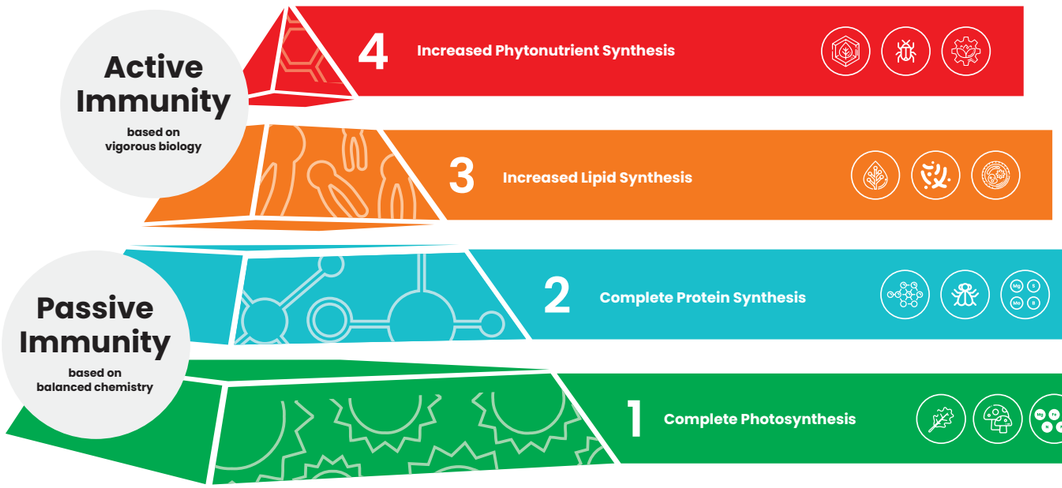
Regenerative agriculture begins by improving plant health. As plant nutrition improves, energy and immunity of crops increase, creating higher yields, better shelf life, flavor, and reduced dependence on pesticides. As quality increases, yield can't be stopped from following.

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.

Plant Health Pyramid

"Healthy plants can become completely resistant to diseases and insects." -John Kempf



1 Complete Photosynthesis

Photosynthetic efficiency increases substantially, shifting the carbohydrate profile to more complex carbohydrates and fewer non-reducing sugars.

Plants develop resistance to soil-borne fungal pathogens, like pythium, rhizoctonia, phytophthora and fusarium.

A balance of magnesium, iron, manganese, nitrogen, and phosphorus is essential for maximum photosynthesis.

2 Complete Protein Synthesis

Soluble nitrogen compounds are converted to amino acids and complete proteins in every 24-hour photo cycle – no excess nitrates or ammonium remain in plant sap.

Plants become resistant to insects with simple digestive systems, especially larval and sucking insects such as aphids, leafhoppers, white flies, thrips, tomato hornworms, cabbage loopers, corn borers, and ear-worms.

Adequate levels of magnesium, sulfur, molybdenum, and boron are key to complete protein synthesis.

3 Increased Lipid Synthesis

Nutrients absorbed in the form of microbial metabolites require less energy for cellular conversion. The extra energy is stored as plant lipids, like waxes and oils, shielding the leaf surface from pectolytic enzymes released when pathogens land on the leaf surface. The extra energy can also be used in times of energy crisis.

Plant develops increased resistance to airborne fungal and bacterial pathogens on the leaf like downy and powdery mildews, late blight, fire blight, rust, bacterial speck, and bacterial spot.

An active and functioning symbiotic relationship between plant and the (soil) microbiome is crucial to provide plants nutrition in the form of microbial metabolites to reach this stage of health.

4 Increased Phytonutrient Synthesis

Plant immune pathways (SAR and ISR) are prompted and enhanced by the plant's microbiome, resulting in increased concentrations of immune compounds and increased phytonutrient synthesis.

Plants develop increased resistance to the entire beetle family, stink bugs, squash bugs, root knot nematodes, and even viruses.

Plants require diverse and abundant microbiome relationships to trigger immune responses to reach this stage of health. Any nutrient imbalances and deficiencies quickly limit a plant's ability to reach this level.

Product Categories and Application Method

Products	Category	NOP Compliant	Seed	Soil	Foliar
BioCoat Gold™	Essentials	✓			
SeedFlare™	Essentials	✓			
Rejuvenate™	Essentials	✓			
Spectrum™	Essentials	✓			
SeaShield™	Essentials	✓			
SeaGuard™	Essentials				
MacroPak™	Essentials	✓			
MicroPak™	Essentials	✓			
Accelerate™	Functional	✓			
SeaStim™	Functional	✓			
SeaCrop™	Functional	✓			
PhotoMag™	Functional	✓			
HumaCarb™	Functional	✓			
CalGuard™	Nutritional				
HoloCal™	Nutritional	✓			
Holo-K™	Nutritional	✓			
HoloPhos™	Nutritional	✓			
Rebounds™	Nutritional	✓			
MycoGenesis™	Biological	✓			
BioGenesis™	Biological	✓			
Micro5000™	Biological				
Micro5000 Organic™	Biological	✓			
PZ 1000™	Biological				
BioDigester™	Biological	✓			
OP-8™	Biological	✓			
Pepzyme Clear™	Biological	✓			

Product Categories

1 Essentials

Any grower of any scale could benefit from these products and should consider using them. They are designed to be used confidently without the need for sap analysis.

2 Functional

These products can be applied strategically based on the Critical Point of Influence for each crop. This approach allows you to target specific plant behaviors, such as initiating flowering, fruiting, or other desired outcomes, precisely when needed.

3 Nutritional

Products that deliver specific nutrients. They are most effective when informed by data from sap analysis, though it's not a requirement

4 Biological

These probiotic inputs contain beneficial microorganisms, such as bacteria and fungi, to promote healthier soil and enhance plant growth.

BioCoat Gold™

Germination Catalyst

Why Use?

BioCoat Gold™ provides the nutrients and soil microbes needed during germination so seeds can get off to the best start possible. BioCoat Gold™ allows newly emerged roots to be immediately inoculated with vital microbial life, setting the root system up for sustained nutrient access and availability throughout the growing season. BioCoat Gold's™ low cost and high ROI make it an essential product for any grower.

NOP Compliant

Features and Benefits

- Speeds seed germination
- Increases germination consistency, which means plants are ready to harvest at the same time
- Increases seedling vigor and resistance to weather stressors
- Supplies critical endomycorrhizal fungi
- Replaces graphite, talc, or other lubricants in planters

Key Ingredients

- Microbial inoculants
- Kelp Blend
- Calcium
- Humic Acid

Application Rates and Timing

- Up to 4 oz per 100 lbs of seed or per acre
- Can be increased to 6 oz per 100 lbs of seed for smaller seeds

SeedFlare™

Nutritional Seed Treatment

Why Use?

SeedFlare™ is a nutritional seed treatment that provides trace minerals directly into the seed to encourage rapid germination and emergence. SeedFlare™ is designed to supply nutrients that are commonly missing from commercial seed.

NOP Compliant

Features and Benefits

- Increases seedling chlorophyll content immediately after germination
- Improves root colonization of beneficial microorganisms
- Increases the number and size of reproductive buds
- Increases the size of reproductive bud-associated leaves, which can increase fruit or grain size

Key Ingredients

- Magnesium sulfate
- Zinc sulfate
- Manganese sulfate
- Iron sulfate
- Copper sulfate

Application Rates and Timing

Spray SeedFlare directly onto the seed without diluting it with water to avoid softening the seed.

Rates:

- 2-8 quarts per ton of seed
- 1.6-6.4 ounces per 50 pounds of seed
- 1-3.75 milliliters per pound of seed

Soil Primer

> “There’s a learning curve changing to regenerative farming, but we just keep working on it and the reward is going out there and digging and finding mycorrhizal fungi in your soil - we’re actually doing it!”
>
> — ***John Bays,***
> ***J&V Bays Farm***

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

Soil Primer can help:

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

Soil Primer includes the energy and shelter needed for soil biology to do its work, priming the soil for a more productive crop the next year. It is the first step in creating a regenerative system, by putting more energy into the soil than is taken out.

Soil Primer consists of three key products mixed and applied in a single application:

1. Rejuvenate™ helps build an environment in which microorganisms can flourish by supplying the “tools” they need to do their work.

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.

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, and gets microbes established 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.

NOP Compliant

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

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.

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™

NOP Compliant

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

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 nutritional supplements, and is one of the 3 products in our cornerstone Soil Primer program.

NOP Compliant

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

MacroPak™

All the essential macronutrients in one easy-to-use formula

Why Use?

MacroPak™ is intended to provide the macronutrients needed to build a strong plant that can support large yields, strong photosynthesis, and immune system development. It contains NPK at a rate of 2-2-2 and includes Ca, Mg and S. MacroPak™ provides best-in-class nutrient delivery and efficacy.

NOP Compliant

Features and Benefits

- Provides macronutrients needed for nutritional integrity
- Increases production of plant secondary metabolites
- Increases a plant's capacity for optimal fruit and seed set
- Improves resistance to abiotic stressors
- Improves plant nutrient mobility and uptake
- Increases cell wall strength with plant-available silica
- Encourages larger, stronger roots
- Improves the plant's immune response

Key Ingredients

- Amino acid nitrogen
- Calcium silicate
- Magnesium sulfate
- Kelp extract

Application Rates and Timing

Fruits and Vegetables

- **Foliar:** 1-8 quarts per week.
- **Fertigation:** apply 1-8 quarts each per acre every 5-14 days, or as needed.

Broad Acre Crops

- **In-row:** 2-12 quarts per acre.
- **Foliar:** 1-6 quarts per acre every 3-4 weeks, or as needed

MicroPak™

8 critical micronutrients. 1 package.

Why Use?

MicroPak™ contains a blend of trace minerals that are critical to growing healthy plants. Trace minerals encourage the development of larger and stronger root systems, increase nitrogen fixation and nitrogen use efficiency, enhance sugar transportation, and greatly improve vigor and quality in the buds, blossoms and fruit. MicroPak™ also has a different formulation for California growers.

NOP Compliant CA Different

Features and Benefits

- Encourages larger, stronger roots
- Encourages pest and pathogen resistance
- Provides the building blocks that enable plants to make complex proteins and other compounds

Key Ingredients

- A chelated blend of all the micronutrients found in our Rebound™ product line

Application Rates and Timing

Soil or Fertigation

- Up to 1 gallon per acre every 10 to 14 days

Broad Acre Crops

- **Foliar:** up to 1 gallon per acre every 3 to 4 weeks

Fruit and Vegetable Crops

- **Foliar:** up to 1 quart per acre every week

Accelerate™

Nutritional support for flowering and fruiting

Why Use?

Accelerate™ delivers a wide range of nutrients needed by plants during blossoming. It can increase the number of flowers and improve fruit set or clonal tuber set. It can help encourage and support plants to move from the vegetative growth phase to the reproductive phase.

Accelerate™ is not available in California. Growers there should use Axcel™, which offers the same benefits.

NOP Compliant · CA Different

Features and Benefits

- Increases the quality, viability, and number of buds, flowers, and clonal tubers
- Helps prevent blossom abortion
- Improves resistance to abiotic stressors
- Improves plant nutrient mobility and uptake
- Can be particularly effective at reducing stress on crops impacted by powdery mildew

Key Ingredients

- Bioavailable manganese
- Rock phosphate
- Multiple strains of seaweed
- Natural sources of chitin and fish oils

Application Rates and Timing

For single-flowering crops: Apply once during the season.

- **Foliar:** apply up to 4 gallons per acre, 1-2 weeks before flowering or tuber set commences.
- **Fertigation:** use up to 4 gallons per acre in 2 applications within the two-week period before flowering or tuber set commences.

For continually-flowering crops: Apply as often as weekly.

- **Foliar, drip, or fertigation:** use an initial rate of up to 2 gallons per acre, 1-2 weeks before flowering commences; up to 4 quarts per acre every 2 weeks until flowering is complete.

SeaStim™

A unique blend of cold-processed kelp extracts

Why Use?

SeaStim™ is a liquid seaweed concentrate that provides a myriad of trace compounds. It helps strengthen plant resistance to pests and pathogens. It also helps plants grow stronger and larger roots, so they can more efficiently absorb nutrition. SeaStim™ has a different formulation for California growers.

NOP Compliant · CA Different

Features and Benefits

- Promotes a strong and healthy root system
- Increases efficiency of plant nutrient uptake
- Optimizes conditions for plant resistance to abiotic stress, especially drought stress
- Serves as an excellent food source for soil microbes
- Encourages healthy plant hormone ratios, which leads to higher blossom set and less abortion of maturing fruit
- Helps plants build functional immunity to fungal pathogens

Key Ingredients

A diverse blend of Kelp species, to capture the strongest and most beneficial characteristics of each. SeaStim™ is manufactured through a mechanical cold-process that preserves the potency of its natural compounds.

Application Rates and Timing

- **Row Starter:** up to 2 quarts per acre.
- **Foliar on Broadacre Crops:** up to 2 quarts per acre every 3-4 weeks.
- **Foliar on Fruits or Vegetables:** up to 1 gallon per acre per week.
- **Fertigation:** up to 1 gallon per acre every 10-14 days.

SeaCrop™

Broad-spectrum ocean mineral concentrate

Why Use?

The highly available and broad-spectrum mineral content in SeaCrop™ enables plants to form complex compounds. SeaCrop™ is naturally derived from rich Northern Pacific seawater, and concentrated using a process that renders it low-sodium, and protects its myriad enzymes and organic substances.

NOP Compliant

Features and Benefits

- Improves tolerance to environmental stress such as drought and freezing
- Encourages formation of complex plant compounds
- Promotes beneficial microbial populations
- Enhances overall plant strength and vitality
- University research suggests that SeaCrop may improve immunity to nematodes and increase salinity tolerance in crops

Key Ingredients

Northern Pacific seawater containing:

- 50,000+ organic substances
- Magnesium
- Boron
- A plethora of trace nutrients

Application Rates and Timing

- **Soil Drench or Transplant Solution:** up to 2 gallons per acre in a 2% solution
- **Broadacre crops:** up to 1 gallon per acre (must be a split application), per season
- **Vegetables and Fruit:** up to 1 quart per acre per week
- **Fertigation:** up to 1 gallon per acre

PhotoMag™

Photosynthesis support package

Why Use?

PhotoMag™ provides the key nutrients used in photosynthesis and protein synthesis: magnesium (which is the center of the chlorophyll molecule), cobalt, sulfur, boron, and molybdenum. PhotoMag™ contains all of the nutrients necessary for plants to metabolize nitrogen and synthesize complex proteins.

NOP Compliant

Features and Benefits

- Helps increase photosynthetic efficiency, giving the plant more solar energy for defense, soil building, and yield
- Promotes better mineral mobility from soil reserves
- Facilitates nitrate metabolism within the plant
- Contains magnesium–the building block of chlorophyll
- Contains sulfur, boron, cobalt, and molybdenum to aid in the production of proteins

Key Ingredients

- Naturally-derived magnesium, cobalt, sulfur, boron, and molybdenum

Application Rates and Timing

Forage crops

- Up to 6 quarts per acre 10-14 days after each cutting.

Fruits and Vegetables

- **Foliar or fertigation:** up to 1 gallon per acre every 1-2 weeks

Broad Acre Crops

- **Foliar:** up to 1 gallon per acre
- **Row starter or side dress:** up to 2 gallons per acre

Nitrogen Efficiency

Get more from your nitrogen applications. AEA's Nitrogen Efficiency Program provides a stable, slow-release, plant-available approach to profitable nitrogen management with three AEA products:

1. HumaCarb™ stabilizes free N in the tank by compounding it with humic substances.

2. Rejuvenate™ promotes quick microbial banking of N.

3. Rebound Molybdenum™ helps ensure complete nitrate conversion in plant tissues.

With our Nitrogen Efficiency Program, you can confidently reduce applied nitrogen, knowing that more N will be converted by soil microbial populations into amino/protein nitrogen.

Application rates are calculated according to this formula:

- X = total amount of nitrogen product (not units of N)
- Maintain 10:1 nitrogen to sulfur ratio unit per unit
- 1 pint Rebound Molybdenum per acre
- 3% of X as Humacarb
- 3% of X as Rejuvenate (optional)

"AEA taught me that one of the biggest things we can do is cut out unnecessary inputs. Especially in fertility there's a lot of things that we were applying just because it was what dad did and what granddad did and it doesn't doesn't have to be that way."

— ***James Johnson,***
Carzalia Valley Produce

HumaCarb 2.0™

Humic substances to stabilize nutrients & improve fertilizer efficiency

Why Use?

HumaCarb 2.0™ is a source of stable humic substances that helps support soil microbiology and aids in the uptake of nutrients in the root zone to reduce potential fertilizer loss. Soluble nutrient fertilizers are unstable and can be leached out of the root zone or become complexed by soil minerals very quickly. HumaCarb 2.0's™ unique formulation, retains all the cation and anion holding capacity making it very effective at stabilizing both cations (like Ammonium and K) and anions (like Nitrate and P). By preventing leaching, HumaCarb 2.0™ allows more efficient use of applied fertilizer.

NOP Compliant

Features and Benefits

- Holds nitrogen and phosphorus in the root zone
- Provides carbon to the soil
- Benefits soil biology
- Aids in the uptake of micronutrients
- Complexes plant nutrients
- Optimizes soil conditions for better overall plant mass
- Improves manure pit fermentation
- Contains all three major components of humus: humic acids, fulvic acids, and humin

Key Ingredients

- Natural mined humic substances

Application Rates and Timing

Side Dress or Fertigation

- Mix with liquid nitrogen or phosphorus fertilizer at 3% of the solution

Small Grains

- Up to 2 quarts per acre at late tilling or as needed

Fruits and Vegetables

- Up to 1 quart per acre per week, starting at transplant or greening

CalGuard™

Highly mobile liquid calcium

Why Use?

CalGuard™ provides a form of calcium that is rapidly translocated into the fruit so that it can be most effective in preventing physiological disorders related to calcium deficiency. CalGuard moves readily into fruit when applied as a foliar spray.

Features and Benefits

- Can prevent many common fruit quality problems: bitter pit in apples, blossom end rot in tomatoes, and others
- Builds strong cell walls
- Increases plant resistance to abiotic stressors
- Positively affects fruit set and formation
- Contains boron to help calcium mobility

Key Ingredients

- Calcium acetate
- Boron

Application Rates and Timing

- **As a foliar or in fertigation:** apply up to 1 gallon per acre at appropriate plant growth stages.
- **As a soil drench or row starter:** apply up to 2 gallons per acre at appropriate plant growth stages.

When to use:

- During the cell division stage, immediately post-blossom
- Any time during the growing season to increase calcium

HoloCal™

Fast-acting calcium

Why Use?

Calcium is the least mobile of all minerals yet one of the most important. Unlike many calcium sources, HoloCal™ delivers an immediate, strong source of supplemental calcium, whether applied to the soil or as a foliar.

Using HoloCal™ can prevent many fruit quality problems by correcting calcium deficiencies. Calcium is a vital component of a sound fruit quality and storability program.

NOP Compliant

Features and Benefits

- Can prevent many common fruit quality problems: bitter pit in apples, blossom end rot in tomatoes, and others
- Builds strong cell walls
- Increases plant resistance to abiotic stressors
- Positively affects fruit set and formation

Key Ingredients

HoloCal™ is a non-synthetic blend of a uniquely processed, natural source of calcium carbonate.

Application Rates and Timing

- **As a foliar, soil drench, row starter, or in fertigation:** apply up to 1 gallon per acre on all crop types at appropriate plant growth stages.

When to use:

- During the cell division stage, immediately post-blossom
- Any time during the growing season to increase calcium

Holo-K™

Fast-acting potassium to improve fruit quality and storability

Why Use?

Holo-K™ provides a strong, immediate source of potassium that remains available in soils. A generous supply of potassium after the cell division stage is needed to develop large, firm fruit without defects. Low potassium levels at that time will result in smaller fruit or grain kernels, low sugars, and poor coloring.

NOP Compliant

Features and Benefits

- Improves fruit size, test weight, coloring, and flavor
- Helps prevent early blight, green core, and yellow shoulder in tomatoes
- Improves sugar transport to roots, new growth, and fruit
- Builds strong cell walls
- Increases plant pest and pathogen resistance

Key Ingredients

Holo-K™ is derived from high quality potassium sulfate obtained from a natural, mined raw potassium ore which is then chelated with organic acids and complexed with stable humic substances to enhance availability to the plant and reduce soil “tie-up.”

Application Rates and Timing

- **Soil Applications:** up to 2 gallons per acre.
- **Foliar and fertigation:** up to 1 gallon per acre at appropriate plant growth stages.

When to use:

- During fruit fill
- Before periods of temperature increase
- Any time that potassium is deficient

HoloPhos™

A superior form of phosphorus

Why Use?

Phosphorus is an essential nutrient for the transport of the energy created in photosynthesis. Many chemical sources of phosphorus either leach quickly out of the root zone or bind up in soil and become unavailable to the plant. They also negatively impact soil fungal populations. Unlike many other phosphorus sources, HoloPhos™ works within the biological system to be available when plants need it, and to promote microbial activity rather than to shut it down.

HoloPhos™ is not available in California.

NOP Compliant CA

Features and Benefits

- Supports fast and vigorous plant growth
- Enhances root vigor
- Improves photosynthetic efficiency
- Enables energy metabolism and serves as a transportation mechanism for glucose molecules
- Promotes microbial activity

Key Ingredients

- HoloPhos™ is derived from high-quality mined rock phosphate (5% phosphorus), which is chelated with organic acids and complexed with stable humic substances to enhance availability and to reduce soil “tie-up”.
- Contains calcium (5%)
- Also contains many other trace minerals and rare earth elements.

Application Rates and Timing

Fruits and Vegetables

- **Foliar or fertigation:** up to 2 quarts per acre every 7 to 14 days

Broad Acre Crops

- **Foliar:** up to 2 gallons per acre
- **Row starter or side dress:** up to 1 gallon per acre at appropriate plant growth stages

The Rebound™ Line

- Rebound™ Boron
- Rebound™ Cobalt
- Rebound™ Copper
- Rebound™ Iron
- Rebound™ Manganese
- Rebound™ Molybdenum
- Rebound™ Zinc

Single micronutrients for targeted nutrition

Why Use?

The Rebound™ Line contains seven products, each delivering a single micronutrient. They enable growers to apply targeted nutrients based on a plant's specific needs, as determined by sap analysis.

NOP Compliant

Features and Benefits

- Chelated for maximum plant availability
- Effective and safe for both soil and foliar applications
- Stable across a wide range of soil or spray tank solution pH levels
- Compatible with most fertilizers
- Ideal for foliar, soil, or irrigation system applications
- Will not foul low-volume irrigation systems

Key Ingredients

- Micronutrients chelated for plant availability

Application Rates and Timing

- **Soil Drench:** up to 1 gallon per acre.
- **Fertigation/Irrigation:** up to 1 gallon per acre every 10 to 14 days
- **Foliar on Broad Acre Crops:** up to 1 gallon per acre every 3 to 4 weeks
- **Foliar on Fruits and Vegetables:** up to 1 gallon per acre every week
- **In Nitrogen Efficiency Program:** 1 pint Rebound Molybdenum per acre

"What I saw repeatedly in different situations, different weather, different years, and on different soil, was that the AEA program was having a positive impact on my business, so I continue to use them."

— ***Mike Omeg,***
Director of Orchard Operations,
Orchard View Farms, Inc.

MycoGenesis™

Mycorrhizal inoculant

Why Use?

MycoGenesis™ is a dry blend of plant growth-promoting rhizobacteria and mycorrhizal fungi, designed to inoculate soils with microbial life. It helps ensure plants get off to a good start and benefit from the symbiotic relationships and nutrient exchange that take place in healthy, living soil.

NOP Compliant OMRI Listed

Features and Benefits

- Makes nutrients more readily available to plants in forms they can absorb
- Fungal hyphae can drastically increase the soil area a plant's roots can access
- Can increase drought tolerance
- Helps speed decomposition

Key Ingredients

- Plant growth-promoting rhizobacteria and mycorrhizal fungi

Application Rates and Timing

Row crops: Apply in seed row at planting at a rate of 1 pound (454 grams/16oz) MycoGenesis™ per acre.

Root Injection: For trees, mix 1 pound (454 grams/16 oz) of MycoGenesis™ in 20 gallons of clean water. For established trees, inject 64-128 ounces per tree into the root zone around the drip-line of the tree.

Root Dip: For trees or plants, mix 1 pound (454 grams/16 oz) of MycoGenesis™ in 20 gallons of clean water. Dip roots into solution and plant.

Potted plants: Mix 1 gram of MycoGenesis™ per gallon of water. Drench the mixture into pots to saturate the plant's roots. Use approximately 10 grams of MycoGenesis™ per cubic yard of soil mix

BioGenesis NP™

Soil inoculant and root dip

Why Use?

BioGenesis NP™ is a soil inoculant composed of a broad spectrum of beneficial microorganisms along with humic acids and humectants. It is used to help reestablish thriving soil biology. The beneficial microbes in BioGenesis NP™ release nutrients stored in the soil, making the nutrients more readily bio-available to plants in forms they can absorb.

NOP Compliant OMRI Listed

Features and Benefits

- In dry conditions, the humectants in BioGenesis NP™ can hold water, helping microbes establish and seeds germinate.
- Useful as a root dip for transplanting seedlings and trees.

Key Ingredients

- Beneficial soil microbes
- Humic acids and humectants

Application Rates and Timing

- 1 pound per acre
- Can be applied as a root dip, at planting, via aerial or ground spraying, shanked in, applied in furrow, or via flood irrigation.

Micro5000™

Biologically-enhanced foliar

Why Use?

Micro5000™ is a foliar fertilizer and inoculant package. Microbes on leaf surfaces can solubilize nutrients from foliar sprays along with nitrogen from the air to help enable these nutrients to be absorbed through the leaf, reducing the amount of supplemental nutrients needed.
Note: Micro5000™ is not for use in organic production.

Features and Benefits

- 5-15-10 NPK
- can be used several times throughout the growing season
- Helps grow larger, more nutrient-dense fruit
- Helps grow produce with longer shelf life
- Helps grow thicker, stronger, greener turf

Key Ingredients

- Beneficial microbes
- Urea
- Potassium nitrate
- Monopotassium phosphate
- Ammonium phosphate
- Kelp meal

Application Rates and Timing

As a foliar only: 75 - 150 grams per acre

Micro5000 Organic™

Biologically-enhanced foliar for organic growers

Why Use?

Micro5000 Organic™ is a foliar fertilizer and inoculant package. Microbes on leaf surfaces can solubilize nutrients from foliar sprays along with nitrogen from the air to help enable these nutrients to be absorbed through the leaf, reducing the amount of supplemental nutrients needed.

NOP Compliant OMRI Listed

Features and Benefits

- 0-0-15 NPK
- Can be used several times throughout the growing season
- Helps grow larger, more nutrient-dense fruit
- Helps grow produce with longer shelf life
- Helps grow thicker, stronger, greener turf

Key Ingredients

- Beneficial microbes
- Kelp
- Potassium hydroxide

Application Rates and Timing

As a foliar only: 75 - 150 grams per

PZ 1000™

Late-season foliar inoculant

Why Use?

PZ 1000™ is a foliar fertilizer and microbial inoculant in a single package, with an emphasis on potassium. It can help plants absorb nutrients through their surface cells and stomata, especially after flowering is complete. Inoculating the leaf surfaces can also create a competitive environment less suitable for airborne disease.

Features and Benefits

- Enhances plant nutrient uptake at the critical points of influence of fruit set and fruit fill
- Highly cost-effective, even when used many times through the growing season
- Can be used as a stand-in for Micro5000™: use Micro5000™ or Micro5000 Organic™ through the flowering stage, then PZ 1000™ from fruit fill through season's end
- 4-8-20 N-P-K

Key Ingredients

- Potassium nitrate
- Monopotassium phosphate
- Ammonium phosphate
- Potassium sulfate
- Sodium molybdate
- Kelp meal

Application Rates and Timing

As a foliar only: 75 - 150 grams per acre.

BioDigester™

Eats disease out of house and home

Why Use?

BioDigester™ is a blend of soil microorganisms that excel at digesting cellulose. The organisms in BioDigester™ help break down dead plant material, crop residues, compost, prunings, and other plant debris.

NOP Compliant

Features and Benefits

- Helps create disease-suppressive soils by rapidly digesting crop debris that can house disease-causing organisms
- Makes short work of dead plant material left in the field after harvest
- Breaks down plant debris into nutrient-rich soil

Key Ingredients

- Beneficial fungal and bacterial species

Application Rates and Timing

- 50 grams per acre or 10 grams per cubic yard

OP-8™

Serious soil remediation

Why Use?

OP-8™ is a blend of beneficial soil microbes that specialize in digesting petroleum hydrocarbons. Most pesticides used in conventional agriculture are petroleum hydrocarbon derivatives. When the chemical load of a soil is very high, serious biological remediation is the best solution to undo the negative effects of contamination.

NOP Compliant OMRI Listed

Features and Benefits

- Recommended for operations transitioning from conventional to organic
- Beneficial for operations with a long history of chemical or pesticide use

Key Ingredients

- Beneficial soil microbes

Application Rates and Timing

Row Crops: Apply in seed row at a rate of 1 pound (454 grams) per acre

Remediation: Apply at a rate of 2.5 pounds (1,134 grams) per acre of surface area. Mix with 20 gallons of water per 40 ounces of OP-8, and spray onto surface of contaminated area

Pepzyme Clear™

When inoculation fails, Pepzyme succeeds

Why Use?

Pepzyme Clear™ is a package of enzyme extracts that can help get soil microbes established. It is commonly applied with microbial inoculants. Pepzyme Clear™ is especially helpful when in difficult or very degraded soils where prior inoculation attempts have failed.

Pepzyme Clear™ is not available in California.

NOP Compliant CA

Features and Benefits

- Supports microbial establishment in difficult soils, such as sandy soils, those with very low organic matter, etc.
- Helps microorganisms break down organic matter
- Helps make soil nutrients available to plants in the forms they can absorb

Key Ingredients

- Stable liquid enzyme extract

Application Rates and Timing

- 12.5 oz per acre (1 gallon per 10 acres)
- Can be applied as a foliar, via fertigation, or at planting

Sap Analysis

Plant sap analysis provides real-time, actionable data about crop nutrition. Like a blood test for plants, sap analysis shows what nutrients are actually available to the plant at that moment in the season.

Furthermore, by showing how the plant allocates those nutrients, it can indicate nutrient deficiencies before any symptoms become visible in the field.

At AEA, we use plant sap analysis at specific intervals in the crop's life cycle, combined with agronomic data and grower observation, to inform all of our recommendations.

We don't guess, we test. Plant Sap Analysis is a must for smarter, data-driven farming.

It can help:

- Reduce fertilizer costs by applying the right nutrition at the right time
- Grow healthier, higher-yielding crops
- Prevent nutrient deficiencies before they occur

Here's how the process works:

1

Start Order

Contact an AEA team member to get started. We collect information about your field, crop, variety, and number of sample sets needed.

2

Receive Sap Kit

Instructions and materials will be shipped to you. Each analysis consists of two labels, one for old leaves and one for new leaves.

3

Collect Sap Samples

Pack clean, dry leaves into the sample bags. If the leaves are wet with rain or dew, gently pat them dry.

4

Ship Samples to Lab

Pack and ship the samples to the lab according to instructions.

5

Receive Results

When the analysis has been completed, a report will be emailed to you and AEA.

6

Interpret Results With a Consultant

Discover the key nutrient relationships and ratios that determine optimal nutritional balance.

7

Create a Custom Regenerative Program

Apply recommended products to correct the deficiencies and excesses based on the test results.

8

Observe and Measure Crop Health and Quality

Perform follow-up analyses as needed.

9

Harvest Profitable Crop

Track harvest results to show the success of the nutrient program.

10

Plan Next Season

Use accumulated sap analysis data to plan next season's nutrient applications.

Groundwork: Consulting by AEA

How We Work

Regenerative agriculture is a whole-systems approach to farming that focuses on soil management and plant nutrition. It creates nutrient-rich, productive soils that result in disease- and insect-resistant plants.

AEA's expert consultants can guide your farm to require fewer inputs, increase yields, and boost profits.

- We have decades of experience building regenerative systems
- We understand the soil-plant system
- We have the tools to improve and monitor the system's performance

A Systems Approach

We help growers successfully implement regenerative systems and can help solve intractable problems on farms that are already regenerative. We are obsessive about creating systems that actually work in practice, not just that sound nice in principle.

We follow up with measurements and data, to make sure our advice provides returns. Our guidance is always tailored to your farm's unique needs.

Regional and Remote

Our regional teams – with the most knowledgeable, informed and experienced agronomists in regenerative agriculture – offer on-farm and remote coaching throughout the first season and subsequent seasons to make actionable regenerative practices more efficient and effective. Our teams look beyond symptoms, diagnosing root causes and offering solutions to tough agricultural problems before and as they arise.

By working directly with one of these teams, growers have access to a wealth of deep agronomic expertise across crop types, more than a decade of data, and real world experience in regenerative agriculture. These close partnerships allow for timely recommendations based on observations, sap analysis, and coaching through each growing season.

Comprehensive Data Collection

AEA utilizes a mix of leading-edge technology, in-field testing and analytics to help farmers succeed financially and according to other measures of success that result from thriving regenerative agricultural practices. We are continually looking for new ways to apply the best technologies available to our regenerative system toolkit.

Increasing crop profitability begins with analysis of plants and soil. Monitoring nutrients through testing such as plant sap analysis provides in-depth, practical insights into the factors that influence nutrient mobility at different stages of growth. Mineral imbalances can be detected at a cellular level allowing for the precise amount of a needed nutrient to then be applied before a deficiency creates disease or vulnerability.

This in-depth analysis enables growers to make data-driven decisions to proactively solve problems and achieve higher levels of crop quality and yields. At AEA, we don't guess; we test, analyze and provide recommendations based on scientific data, knowledge and experience. Thoroughly testing the soil and plants' nutritional and microbiome integrity allows for determining and then applying the precise amount of needed nutrients before a deficiency becomes a disease or weakness.

Get Started

Each interested grower is assigned a crop or regionally specific team. After initial conversations to discuss goals, issues and potential limiting factors, an AEA Agronomist builds a unique crop protocol for that grower. We provide consulting as a service to growers who purchase our products. We also offer contract consulting without needing to buy our products.

Ongoing support and coaching are offered through on-site visits and remote consultation that works to address issues as they arise.

Now accepting consulting work with select growers. Packages start at $25,000.

To learn how AEA can transform your farm, contact us at hello@advancingecoag.com

Advancing Eco Agriculture

Regenerative solutions for every grower.

Visit: advancingecoag.com
Call: 1-800-495-6603
Email: hello@advancingecoag.com

Follow Us

Regenerative agriculture thought leader and AEA Founder John Kempf hosts scientists and growers, providing actionable information and scientific research relevant to crop quality, yields, water, soil biology and profitability.

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