



The Midwestern BioAg FORAGE PROGRAM

Improving Production From the Ground Up

Midwestern BioAg was founded by a dairy nutritionist over 30 years ago with a single goal: Help dairies improve milk production from the ground up. By focusing on soil health, we've found ways to increase both forage yields and quality. That's why we've stayed focused on the foundation of all farm success — soil health.

Our crop inputs leverage the power of soil microbes to yield forages with higher levels of digestible fiber, protein and essential minerals such as calcium. On-farm and independent research trials prove that our program can increase the quality and quantity of forages grown. As a result, milk production per acre rises, and out-of-pocket supplemental mineral costs decline.



INSIDE:

- Dry Fertilizer Blends
- L-CBF Fertilizer
- Soil Amendments
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- Measuring Quality



BETTER FORAGE. BETTER PRODUCTION.

Dry Fertilizer Blends

Midwestern BioAg's dry fertilizer blends optimize plant growth and forage quality by providing balanced nutrition for both the soil and the crop. Beyond NPK, our blends contain essential secondary and micronutrients to yield quality forages that support the nutritional needs of today's high-performing dairy cattle. As a result, growers on our program benefit from an improved bottom line by reducing the need for purchased feeds and nutritional supplements.

At Midwestern BioAg, we understand that fertilizer ingredient quality is more important than the NPK numbers on the tag. We select fertilizer ingredients to create balanced blends that meet the needs of the soil and the crop for optimal performance.

Our fertilizers are:

- **Balanced.** We balance and blend the right nutrients for your soil and crops, optimizing yields and quality. We address yield-limiting factors by complementing NPK with calcium, sulfur, trace minerals and organic matter to feed soil life and increase nutrient availability.
- **Healthier for the Soil.** Some fertilizers can negatively impact soil life and plant health. Our fertilizers are blended with materials that stimulate and support both soil microbes and plant roots.
- **Available Season-Long.** Most fertilizers give plants a quick charge for a short period of time; ours deliver nutrients throughout the growing season. We mix soluble nutrients with others that are available season-long, enhancing nutrient uptake and performance throughout the year.

Liquid Carbon-Based Fertilizer (L-CBF)

Our L-CBF product line can be applied to regrowth after harvest to boost both forage yield and quality. Made from a molasses base, L-CBF contains sugar to help stimulate soil life and increase plant nutrient availability. L-CBF can be added to herbicides to help reduce drift while also speeding regrowth, allowing growers to intensify harvest schedules without sacrificing plant health and yield.

- **L-CBF BOOST™ 4-0-3-2S:** Add BOOST to your liquid fertilizer program to help improve forage yields and quality.
- **L-CBF TerraFed™ 1-0-3:** Our organic alternative to BOOST, TerraFed can also help improve forage yields and quality.

Soil Amendments

Soil nutrient deficiencies and inadequate pH levels are serious yield-limiting factors. Calcium, boron and other nutrients such as sulfur play significant roles in improving forage yields and quality. Using our soil amendments, producers can correct nutrient deficiencies and improve pH levels to grow higher-yielding, more nutrient-dense forages.

- **Bio-Cal® and OrganiCal™:** Bio-Cal and OrganiCal deliver multiple sources of highly available calcium and plant-available sulfur to improve forage yield and quality. These proven products provide fast-acting and slow-release calcium for season-long plant health and performance.
- **Potassium Sulfate:** Potassium sulfate has a lower salt index than potassium chloride and also supplies sulfate sulfur for improved plant performance. Sulfate sulfur is highly plant available and supports complete protein formation in plants.
- **High-Cal Lime:** Forages grow best when soil pH levels are around 6.8 to 7.2. Adding high-cal lime when a pH increase is needed can boost yields, while added calcium can improve plant nutrient availability.



Independent research shows Bio-Cal can increase alfalfa yields by as much as 10.7%

Forage Seed Varieties

Our forage seed varieties have been carefully selected for yield potential, feed quality, disease and pest resistance and regional adaptability. Options include both pure alfalfa and grass mixes for all types of livestock in a variety of production stages.

- **WinterKing™ III Alfalfa:** The third generation of WinterKing alfalfa, WinterKing III will produce forage with high dry matter yield, milk-per-acre and NDFD. With its strong multi-leaf expression rate and leaf-to-stem ratio, this new variety will produce high-performing, nutrient-dense forages for livestock. WinterKing III is Nitro-Coat treated.
- **HQF Dry Tolerant Pasture:** Our HQF Dry Tolerant Pasture mix is a blend of tall fescue (50%), meadow fescue (30%), perennial rye (15%) and timothy (5%). While most high-energy pastures go dormant in late summer, this blend is designed for improved heat and drought tolerance. As a result, pastures will grow longer into the summer and provide energy for season-long production.
- **HQF Hi-Energy Pasture:** Our HQF Hi-Energy Pasture blend is designed for grazing dairy cattle and finishing cattle and sheep. It includes perennial rye (40%), tall fescue (25%), meadow fescue (20%) and festulolium (15%). Pair with red clover and chicory to provide livestock with a highly digestible source of energy.
- **HQF Dry Hay:** HQF Dry Hay is a mixture of tall fescue (80%), orchardgrass (15%) and timothy (5%) selected for dry weather and heat tolerance. Although timothy goes dormant in late-summer, it provides exceptional energy and quality in early cuttings. Pair HQF Dry Hay blend with WinterKing alfalfa for a superior forage blend.

MEASURING QUALITY: FOUR KEY COMPONENTS

Minerals

The availability of minerals from forages can be higher than the availability of minerals from a bag. Plants have a unique ability to transform inorganic minerals from the soil or fertilizer and change them into organic, highly available forms. Most forages are low in calcium and too high in potassium due to common imbalances in typical fertilizer programs. Midwestern BioAg recommends forage calcium levels of at least 1.5 percent and potassiums levels under 3 percent. Phosphorus and magnesium should both be at 0.35 percent or higher. When minerals reach these target levels, cows perform exceptionally well.

Protein

Protein use is optimized in the cow when forages contain a nitrogen-to-sulfur ratio of 10:1. To calculate the N:S ratio using forage test results, divide crude protein content by 6.25. Next, divide that number by sulfur content to generate the N:S ratio. Without available sulfur, forage crops cannot make the sulfur-containing amino acids cysteine and methionine. Under these conditions, forages can form excessive nitrates and incomplete proteins, which can negatively affect herd health. Adding sulfate sulfur to fertilizer helps plants form complete, available proteins.

Fiber

Fiber values in forage tests represent digestibility. As ADF increases, forage digestibility decreases. Neutral Detergent Fiber Digestibility (NDFD) is an estimate of the portion of NDF digested by rumen microbes over a period of time. Higher NDFD results in higher forage intake and better production. uNDF240 is a more precise analysis that measures and evaluates indigestible fiber (it is twice as accurate as measuring lignin). This is the amount of NDF in a feedstuff that will never be digested. uNDF240 has many uses in ration balancing, including rate calculations for NDF

Recommended Alfalfa Test Levels	
Component	BioAg Target
Crude protein*	20-23%
N:S	10:1
ADF	28-30%
NDFD 30	> 52%
IVTDMD 30	> 80%
uNDF240	< 15%
Ash	10-13%
Calcium	> 1.5%
Phosphorus	> 0.35
Magnesium	> 0.35
Potassium	2.25-3.0%
Sulfur	10:1 N:S or 1:10 S:N
Chloride	< 0.30%
RFV	> 150
RFQ	> 175

*Crude protein = forage nitrogen × 6.25

digestion (as an indicator of rumen fill and intake potential of a diet) and forage comparison.

Energy

Locked within digestible fibers are sugars. When forages grow with a proper balance of nutrients, they produce solid stems filled with white, fibrous material called pectins. Pectins are carbohydrates that break down into sugars in the rumen of the cow and provide energy. When calcium levels are high, pectin levels also increase, improving digestibility.