Animal Health International Inoculant Newsletter

ENHANCING FEED QUALITY

SPRING 25

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Passion Ag Oxygen Barriers: Results That Deliver

Prepare for spring with protected crops. Learn how Passion Ag's oxygen barriers prevent oxygen infiltration, which means fewer protein supplements for your crops and lower costs for you.

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Boost Spring Crop Yields, Cut Supplement Costs with Passion Ag

Felipe X. Amaro, Ph.D., PAS, Global Technical Support and R&D, Passion Ag

The spring crops silage harvest season is just around the corner, and, like all silage crops, these valuable feeds require protection from oxygen to optimize fermentation. This is especially important for high-quality, protein-rich forages such as haylage. By preventing oxygen infiltration, oxygen barrier films help preserve the silage's protein content, reducing the need for additional protein supplements in livestock diets.

When alfalfa haylage is exposed to oxygen during storage, aerobic microorganisms such as yeasts and molds proliferate, leading to significant nutrient losses. This primarily results in the breakdown of sugars and proteins, reducing the silage's protein concentration and energy value. Passion Yellow, the oxygen barrier included in Passion Combo, effectively minimizes yeast and mold growth in silage (Figure 1) by preventing air infiltration into the drive-over pile or bunker, thus preserving the quality and yield of your crops.

Losses of dry matter and protein due to aerobic deterioration in alfalfa silage can reach up to 116 tons in a 1,200-ton silo. Additionally, these losses translate to 19 tons of protein loss, increasing the need to purchase protein supplements such as soybean meal or canola meal – sometimes by more than two truckloads (Figure 2a). Protein supplements are often expensive, accounting for a significant portion of feed costs in livestock production. By preserving the inherent protein in alfalfa silage, farmers can achieve cost savings while maintaining optimal animal performance.

When it comes to animal performance, aerobic spoilage microorganisms not only produce toxins and other harmful compounds that hinder animal production, but also reduce the silage's energy availability (NEL; Figure 2b) by decreasing its nutritional value and digestibility. This energy loss directly translates to less milk in the tank or fewer pounds on the scale. Passion Ag's oxygen barriers work to protect both the quality and yield of your crops, all while reducing feed costs – achieving optimal animal performance and higher productivity.

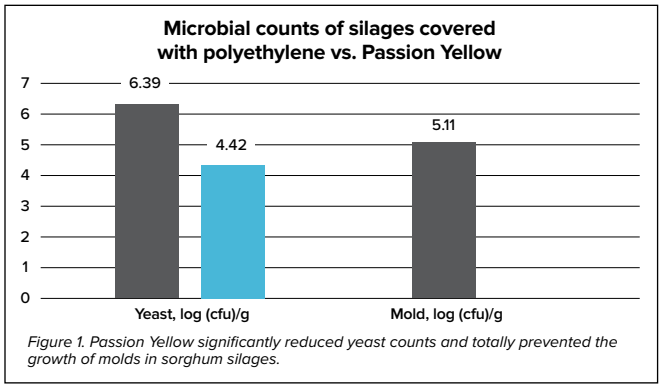


Figure 1. Passion Yellow significantly reduced yeast counts and totally prevented the growth of molds in sorghum silages.

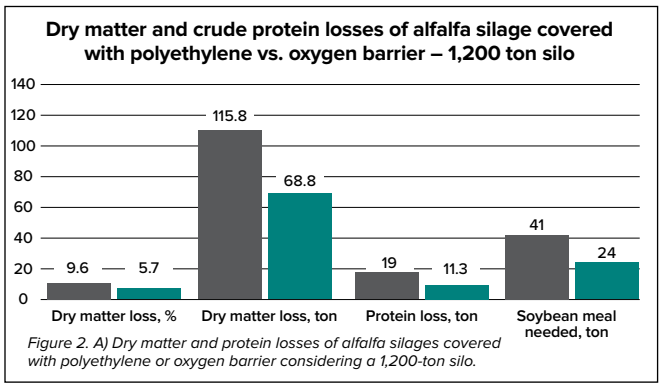


Figure 2. A) Dry matter and protein losses of alfalfa silages covered with polyethylene or oxygen barrier considering a 1,200-ton silo.

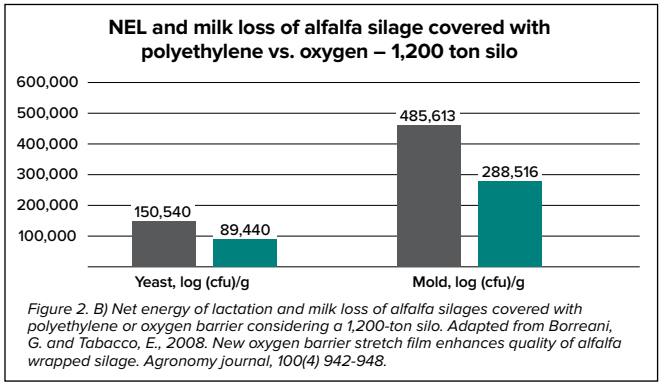


Figure 2. B) Net energy of lactation and milk loss of alfalfa silages covered with polyethylene or oxygen barrier considering a 1,200-ton silo. Adapted from Borreani, G. and Tabacco, E., 2008. New oxygen barrier stretch film enhances quality of alfalfa wrapped silage. Agronomy journal, 100(4) 942-948.

Polyethylene Passion Yellow Oxygen Barrier

PASSION AG

Nine Critical Control Points for Silage Quality

Keith A. Bryan, PhD, Global Technical Portfolio Manager, Silage Inoculants and Cattle Probiotics, Novonesis

Silage quality is shaped by a series of decisions throughout the ensiling process. To enhance nutritional value, digestibility, and conversion rates, focus on these nine critical control points:

1. Safety

- Agriculture is one of the most hazardous industries.
- Every serious injury or fatality during ensiling is preventable — safety must be a top priority.

2. Decision Making

- Identify key decision-makers and empower them to act quickly and correctly.

3. Maturity

- Harvest timing balances yield and digestibility — later maturity increases yield but reduces quality.

4. Dry Matter

- Targeting the right moisture level minimizes fermentation risks, reduces effluent, and optimizes density.

5. Particle Length

- Chop length influences compaction, fermentation, and fiber effectiveness in the diet.
- Drier crops require shorter particle sizes for proper packing.

6. Kernel Processing Score (KPS)

- High KPS improves the digestibility of corn silage — ensuring proper kernel processing.

7. Inoculant

- Using a proven inoculant, such as SILOSOLVE®, enhances silage quality and stability.

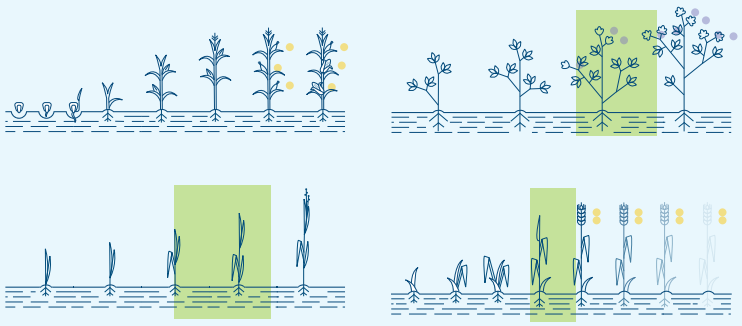
8. Compaction

- Oxygen is the enemy – match forage delivery rate to packing tractor weight to exceed the “rule of 800.” (Packing tractor weight [lb] = 800 × tons of forage delivered per hour).

9. Sealing

- Seal quickly and effectively:
  - Use oxygen barrier film.
  - Apply weight uniformly, with gravel bags along walls and edges.
  - Regularly inspect and repair holes with plastic tape.

For more information visit **Novonesis.com**.



Maturity stages for corn, grass, alfalfa and small grains

novonesis

Renato Schmidt, PhD., Forage Products Specialist, Lallemand Animal Nutrition

Small-Grains Silage: Big Opportunities for Your Forage Program

Small-grains crops can increase forage inventory and add flexibility to a traditional silage crop program to help achieve your production objectives. These crops present a high content of soluble sugars and low buffering capacity, are easy to establish, and can be grown in a wide range of climatic and soil conditions.

Effect of maturity and moisture at the time of harvest.

It is well established that plant growth and maturity bring more yield but decreased quality (Figure 1). Small grains should be harvested at the boot stage for best quality (15 - 20% crude protein [CP], >65% total digestible nutrients [TDN]), wilted to 35 - 40% dry matter (DM), and fed to lactating cows and young heifers. It can also be direct-cut and ensiled at the heading to soft dough stage (12% - 15% CP, 55 - 65% TDN) for other cow groups such as dry cows and >1-year-old heifers. It is critical to monitor the field closely, since these cereal crops advance very quickly from vegetative (boot) to reproductive (dough) stages. At 35% DM, 5 to 7 tons per acre should be expected at boot stage and between 8 to 10 tons per acre at dough stage. It is important to remember that the level of CP declines with maturity as percentage of DM; in terms of pounds of CP per acre, this measure remains constant due to higher yield. Still, one must bear in mind that ensiling at early maturity requires wilting, which translates to more wheel traffic, higher fuel and labor costs, and potential for soil contamination. In contrast, harvesting at later stages limits the options for double-cropping.

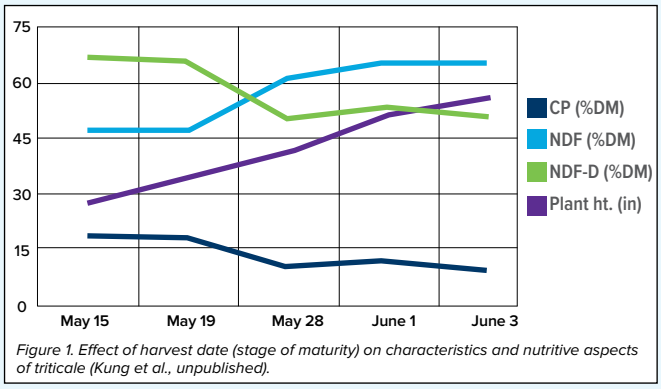


Figure 1. Effect of harvest date (stage of maturity) on characteristics and nutritive aspects of triticale (Kung et al., unpublished).

Figure 2. Triticale samples from the same silo face showing the impact of varying DM levels leading to inconsistent fermentation patterns (Schmidt, 2018).

Small-grain forage ensiling tips.

Ensiling small grains follows the usual basic requirements: anaerobic conditions, proper moisture and simple sugars for fermentation led by competent lactic acid bacteria. Anaerobic conditions, i.e., packing density, will set the stage for the anaerobic fermentation to occur – so always spread the forage in thin layers (4 – 6 in), pack tight driving over the entire surface at least twice, and cover immediately. Packing mature small grains can be challenging due to their hollow, air-filled stems, which increase volume and porosity. To achieve a recommended fresh packing density of at least 45 pounds per cubic foot, it is recommended to chop them finer (1/4 to 3/8 inch). Lower temperatures and calm, cloudy days affect drying rates and plant quality, making wide swathing beneficial. Soil contamination during drying can delay fermentation and introduce undesirable microorganisms. Ensiling outside the desired moisture content (60% to 65%) leads to different challenges and high variability (Figure 2). Excess moisture leads to extensive fermentation, high acid load and protein breakdown. In addition, excess moisture can encourage the development of clostridia and seepage. Drier forages are more difficult to pack due to their high porosity, allowing plant respiration and production of heat, mold, and sometimes mycotoxin production and protein damage.

Make even good fermentation better.

A high application rate of a research-proven inoculant such as *L. buchneri* 40788 in combination with *L. hilgardii* I-4785, targets feedout stability and helps maintain good hygienic conditions in silage through the conversion of moderate amounts of lactic to acetic acid, which has strong antifungal proprieties. This is an important and specific process: The natural production of acetic acid from a "'wild" fermentation leads to higher losses and without the expected results in aerobic stability (Table 1). Keep in mind: You will get the best results by harvesting the forage at the targeted stage of maturity and within the optimal DM range, and it is vital to practice proper management strategies during each step of ensiling. For more information, please visit: **https://magniva.lallemandanimalnutrition.com/en/usa/**.

Item	Untreated	*L. buchneri* 40788
Acetic acid, %DM	4.01	5.92
Yeasts, log CFU/g	4.89	2.63
Aerobic stability, h	66	190

Table 1. The effects of controlled production of acetic acid on feedout stability characteristics of barley silage after 10 months of storage (Taylor and Kung, 2002).

Converting Applicator Systems from Propionic Acid to Liquid Hay Guard or Silo Guard

International Stock Food

Best Practice Flushing Procedure.

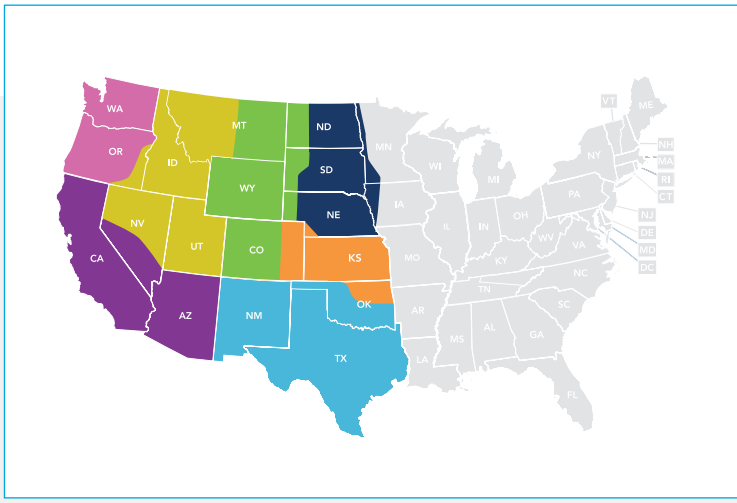
Supplies: One box of baking soda, 11 gallons of water, large bucket, stirring implement. Before flushing, drain acid from tank and flush with water.

1. Measure out 2/3 of the box of baking soda.
2. Fill the bucket with 5 gallons of water.
3. Add the baking soda to the water and stir to dissolve.
4. Dump mixture in tank, then add 5 more gallons of water to the tank.
5. Splash mixture around in tank, then let sit for 10-15 minutes.
6. Run the water/baking soda mix through system.
   a. For Harvest Tec automatic applicators, turn on pumps, then hit override.
   b. For Dohrmann and other applicators, turn on pump at controller.
7. When mostly empty, drain tank and then flush with water.
8. Clear filters.
9. Take the remaining 1/3 box of baking soda and mix it in a hand sprayer with one gallon of water.
10. Spray pickup and anywhere acid has touched.

Once you've completed the flushing process your tank is now ready for Liquid Hay Guard® or Silo Guard®.

Note: Check to see that there is a 100 mesh filter at the pump (green). If a white screen (40 mesh filter) is there, change it to the 100 mesh filter (green).

HAY GUARD®



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For more information about our inoculant products and services contact your Animal Health International sales rep or visit our website.

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