5 FACTS TO KNOW BEFORE ADDING GE REDUCED LIGNIN ALFALFA TO YOUR SEED ORDER

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Alfalfa is a staple in many animal diets because it is an excellent source of fiber and high-quality protein. It's complementary to other types of forage and grain, cost-effective, and palatable.

However, there can be challenges when feeding alfalfa mainly due to the forage’s digestibility. A recent industry push has prompted research to help overcome this challenge. This research has resulted in a solution: genetically enhanced (GE) reduced lignin alfalfa.

#1. What is lignin?

Lignin is a structural component of the alfalfa plant that holds it upright, but its woody texture makes it indigestible. Lignin also binds with other cell wall components further decreasing digestibility. As the alfalfa crop matures, lignin content increases lowering digestibility, which makes harvest timing vital.

Researchers know there are several steps in the process of lignin synthesis in alfalfa. This process involves 12 different enzymes, each required for a particular step. After taking these facts into consideration, scientists questioned what they could do to sustain the alfalfa plant, while making its nutrients more readily available.

#2. Developed through research

Researchers found two ways to reduce lignin content in alfalfa. The first way is to select for improved forage quality and reduced lignin using conventional breeding techniques.

The second method involves a biotech-derived trait that uses GE technology for gene suppression to rewire the process alfalfa plants use to make lignin. This discovery came during a long-term research effort by the Consortium for Alfalfa Improvement where they discovered enzymes that change both lignin content and lignin composition.

#3. Increased flexibility for harvest

One of the biggest benefits of GE reduced lignin alfalfa is the ability to delay harvest. Delaying harvest can result in higher forage yield, improved persistence, and increased harvest timing flexibility. Multiple university-conducted cutting management trials with conventional alfalfa consistently demonstrate that early and more frequent harvest is often a requirement for the production of high-quality hay suitable to feed high-producing dairy cows. However, forage yield and stand persistence are improved when you delay harvest until the 10 percent bloom stage.

For example, trials conducted at the University of Wisconsin have shown a 15-20 percent forage yield advantage for a three-cut versus four-cut management system over a four-year rotation. Forage quality of conventional alfalfa in the University of Wisconsin three-cut trial was significantly lower than in the four-cut trial. This “forage yield versus forage quality tradeoff” defines the dilemma most alfalfa growers have in managing their cutting strategy. The potential for delayed harvest with GE reduced lignin alfalfa without sacrificing forage quality provides growers a “high yield, high quality” solution to this historical dilemma.

With the introduction of this new trait, alfalfa growers have the potential for fewer cuts per season and the lower harvest costs that come along with it. Midwest growers are likely able to eliminate one cutting per year, while in the West where 8-12 cuttings per year are common, two could be eliminated.

Another point of consideration for alfalfa harvest flexibility is the time required to dry. GE reduced lignin alfalfa is comparable to other varieties currently available on the market, allowing growers to harvest as haylage or dry hay.

#4. Higher quality, increased digestibility

With the option to maintain regular harvest schedules for higher quality forage or delay harvest for 7-10 days to gain increased yield without increased lignin, there is a greater opportunity to produce premium-quality hay with higher digestibility.

Preliminary trials using GE reduced lignin alfalfa experimental varieties are showing a 10-15 percent increase in Neutral Detergent Fiber Digestibility (NDFD) and Relative Forage Quality (RFQ) compared to conventional commercial checks harvested at the same time. This increase could translate into a 20-point RFQ advantage and a $15-20 per ton price premium based on current Midwest hay pricing standards.

Research shows that a one-unit increase in in vitro digestibility of NDF is associated with a 0.37 pounds per day increase in dry matter intake (DMI) and a 0.55 pound per day increase in 4 percent fat-corrected milk yield per cow.1 High-quality forages also show greater DMI responses with early lactation, higher producing cows that are more bulk-fill limited.

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#5. Lodging not an issue

An increase in digestibility due to lower lignin content can be a concern for some growers because of lodging. When brown mid-rib (BMR) corn came onto the market, one of its primary characteristics was lower lignin content. The enzymes to help reduce lignin in BMR corn were effective, but scientists discovered they also had a major effect on standibility. As a result, some lodging issues occurred in the field. When it came to the enzyme used in GE reduced lignin alfalfa, no effect on lodging was observed.

So why isn’t lodging an issue with GE reduced lignin alfalfa? Lignin is only 5-6 percent of the plant and GE reduced lignin alfalfa focuses on reducing 12-15 percent of that lignin. The enzymes used in these varieties target the lignin cells that don’t effect stand. Therefore, the plant can stand tall and contain nutrients that are more readily available.

Forage quality and digestibility go hand-in-hand, and that’s why the introduction of GE reduced lignin alfalfa is so exciting. It gives growers a more flexible cutting window in addition to decreasing lignin content while increasing the digestibility of the plant and maintaining stand.

To learn more about HarvXtra® alfalfa, visit www.plantnexgrow.com, contact your local NEXGROW® retailer or seed advisor or by emailing info@plantnexgrow.com for information specific to your region.

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