

DAIRY PIPELINE

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Reduced-lignin (RL) alfalfa: What's new about it?

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“Reducing lignin concentration in alfalfa fiber has been a main goal to increase fiber degradability in the rumen.”

Alfalfa is a forage typically included in rations for dairy cattle. This forage can be directly grazed, as seen in grazing systems from Argentina, or can be incorporated into total-mixed rations (TMR) as hay or silage, as seen in confined systems from the US and most parts of the world.

Fiber is a constituent of forages that is slowly degraded in the rumen, and the concentration of lignin within the fiber is the main determinant of fiber degradability in the rumen. Even though alfalfa is characterized for having low concentrations of fiber in the whole-plant, the concentration of lignin within the fiber is relatively high (>18%, NDF-basis). A low fiber degradability may limit dry matter intake and, hence, production performance.

Reducing lignin concentration in alfalfa fiber has been a main goal to increase fiber degradability in the rumen. As the enzyme *caffeoyl CoA 3-O-methyltransferase (CCoAOMT)* is needed to synthesize lignin, the downregulation of CCoAOMT has been the target to increase the digestibility of fiber of alfalfa. Currently, alfalfa cultivars containing the HarvXtra trait that downregulates CCoAOMT are commercialized in the US. This cultivar is also known as reduced-lignin (RL) alfalfa.

A study recently published in Crop Science compared the yield and the nutritional quality of RL and non-RL alfalfas when harvested at 3 different cutting intervals (i.e., 28, 33, and 38 days). Following are some findings from such study.

- RL alfalfa yielded 6% less than the other non-RL alfalfas when averaged across all harvest times (1.33 vs. 1.42 ton DM/ha).
- RL alfalfa contained 23.1% crude protein, whereas non-RL alfalfas contained 22.2 to 22.9% crude protein. The authors suggested these differences were marginal and of little biological significance when considering a TMR for dairy cattle.
- RL alfalfa contained 33.4% NDF, whereas non-RL alfalfas contained 34.6 to 36.1%

NDF. There was some evidence that the lower NDF concentration in RL-alfalfa was related to a greater leaf-to-stem ratio.

- RL alfalfa contained 7.1% lignin (DM basis), whereas non-RL alfalfas contained 7.7 to 7.8% lignin. This means that the concentration of lignin, on a DM basis, was 8.4% lower for RL alfalfa than for non-RL alfalfa. Even though the authors did not measure it, the concentration of lignin on an NDF basis was 21.2% for RL alfalfa and 21.6 to 22.2% for non-RL alfalfa.
- In regard to 48-hour digestibility, while 53.3% of the fiber disappeared in the RL alfalfa, only 49.5 to 50.6% disappeared in the non-RL alfalfa. These differences imply a 5.3 to 7.7% increase of fiber digestibility in favor of RL alfalfa.
- Maybe the most relevant finding of the study is that RL alfalfa harvested at 38-day intervals provided similar yields to non-RL alfalfas harvested at 33-day intervals without compromising forage quality. This implies that similar yields of similar quality could be obtained with fewer cuts in the season, which may translate to increased plant stand persistence and reduced harvesting costs.

In summary, information about the yield and quality of RL alfalfa is emerging. The data indicate that a good balance between forage quality and yield can be obtained. Unfortunately, knowledge related to the performance of dairy cows fed RL alfalfa is lacking. Hopefully, in the near future we will perform some feeding trials at Virginia Tech to examine animal performance.



Upcoming Events

See [VTDairy](#) for details.

November 1-2, 2019

Virginia Tech Dairy Science
Open House

November 5-6, 2019

Penn State Nutrition Conference

December 10, 2019

FARM 4.0 and New ID
Requirements

January 16, 2020

Winter Calf Meeting

February 12-13, 2020

Virginia Sate Feed
Association and Nutritional Cow
College

If you are a person with a disability and require any auxiliary aids, services or other accommodations for any Extension event, please discuss your accommodation needs with the Extension staff at your local Extension office at least 1 week prior to the event.

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For more information on Dairy Extension or to learn about current programs, visit us at VT Dairy—Home of the Dairy Extension Program on the web at: www.vtdairy.dasc.vt.edu.



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A year-end to-do list for farm and family

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You know how things are supposed to slow down towards the end of the year – crops are in, there’s less to do outside, and there’s the subtle slow-down around holiday season. Yeah, right! It seems that the pace of life starts to speed up around January 1st. Well, here’s a year-end to-do list to reduce your stress level and prepare for the upcoming year.

1. Build your year-end balance sheet. This will help with loan renewals in the spring. It will also enable your lender to make accrual adjustments to your Schedule F, providing you with more accurate financial information for your planning purposes. Make time to walk around your farm to estimate the value of your feed inventories, cattle numbers and real assets.
2. Schedule time for a business meeting to evaluate the farm’s current condition and to go over your plans for the upcoming year. This is especially important if your farm is an LLC, C-corp, or S-corp because it may help maintain any limited liability protection you might have through your legal form of organization. Keep written minutes of your meetings to keep you on task and avoid “selective memory loss.”
You need to devote 5-10% of your time for strategic planning for your family and your farm. Use these meetings to develop your family, farm, and personal goals. Update your farm’s business plan; then, use that plan and the minutes from previous meetings at every business meeting to keep on track toward meeting your goals.
3. Schedule a meeting with your accountant before January 1 to discuss year-end tax moves. I strongly suggest that you ask about starting a retirement account for yourself and/or your farm BEFORE you make any pre-payments or Section 179 purchases. The retirement accounts may give you better overall tax advantages than purchasing assets, and it will help you prepare for your future. Remember, you need to spend \$5 to save \$1 in taxes; maybe you’re better off using cash to build your liquidity rather than trying to minimize your taxes.
4. Make time for yourself and your family. It’s too easy to get wrapped up in the hectic day-to-day nature of the farm. Time away from the farm can reduce your stress level, improve your mental health and help you get energized for the upcoming year. “But I have to...” – stop right there – ask yourself, “What are the most important things in my life?” Chances are your answers will include your family, your friends and your faith – so spend some quality time with the most important people in your life.
5. Start the discussion about transition planning with your family and business partners. It’s not an easy discussion to have, but someone NEEDS to start the conversation. Ease into it by talking about some important, but relatively non-intrusive, estate planning tools such as durable powers of attorney and advance medical directives. Or talk about how everyone needs to revise their insurance plans (updating the policy amount, revising the beneficiaries, etc.). It’s hard to start the transition conversation, but once you start it gets a lot easier.
6. Last, but certainly not least, take time to look back on the history of your farm and family. Write down this history and develop a written timeline of major events (good and bad). Recognize and celebrate all the accomplishments! Laugh about the silly decisions that have been made over the years because you have overcome them! Honor those who have helped you and your family get where they are today! And be sure to regularly give thanks for all the blessings and good times that you and your family have experienced over the years.

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