MINNESOTA-Forage Quality Improvement in Reduced-Lignin Alfalfa Monoculture & Alfalfa-Grass Binary Mixtures

Craig Sheaffer, University of Minnesota

In cooperative research with Cornell University and University of Kentucky, we are evaluating the compatibility of new reduced-lignin alfalfas with meadow fescue, festulolium, and a new sparse-flowering orchardgrass. The work is supported by USDA-NIFA through the Alfalfa Seed & Alfalfa Forage Systems Research Program (AFRP). Mixtures will be subject to harvest when alfalfa reaches the bud and first-flower stage. Use of new reduced-lignin, high-digestibility alfalfas is a new approach to increasing profitability and use of alfalfa. Alfalfa is frequently grown in binary mixture, and new grasses provide unique opportunities to increase use of alfalfa mixtures. Mixtures of grasses with alfalfa provide several advantages compared to alfalfa monocultures, including: reduced chance of alfalfa heaving and winterkill, maintenance of productive forage yield as the alfalfa component declines, faster drying of mixed alfalfa-grass forage in the field, and reduced bloat potential of grazed alfalfa.

Neither festuloliums nor sparse-headed orchardgrass have been evaluated in mixture with alfalfa over diverse ecological regions and harvest regimes suitable for new reduced-lignin alfalfa. Orchardgrass is often used for mixture with alfalfa, but orchardgrass can crowd out alfalfa and stands can become predominately grass. In addition, orchardgrass can winterkill. We will be evaluating a new, sparse-heading (reduced-flowering) orchardgrass with improved forage quality. Meadow fescue is a relatively high quality grass having potential to be less competitive in binary mixtures with alfalfa compared to orchardgrass. *Hidden Valley* meadow fescue has higher digestibility than existing meadow fescue cultivars and orchardgrass. Festuloliums, which are either tall fescue or meadow fescue crosses with ryegrass, also have potential for high quality and to persist in mixed stands. However, they are relatively more susceptible to winter injury than orchardgrass and meadow fescue.