Almighty Alfalfa

New and improved alfalfa varieties and management techniques are researched regularly. Here's a roundup of recent findings.

Story & photo by ***Kindra Gordon***

Often called the "queen of forages," alfalfa is a favorite feedstuff because of its high-protein potential. Forage researchers continue to improve the persistence, pest resistance and productivity of this mighty plant — adding to its appeal. The following are some of the latest options for including alfalfa in your program.

Traffic tolerance

Research plots have indicated that alfalfa yield losses can be as high as 70% due to the stress of using heavy machinery on plants several times during the season. Therefore, one of the newest traits being fused into alfalfa varieties is tolerance to wheel traffic.

Topping the list is AmeriStand 403T from America's Alfalfa. It was developed specifically to handle plant damage and soil compaction caused by tractor traffic. Results from a three-year yield-under-traffic study at the University of Wisconsin (UW), show that AmeriStand 403T produced an annual yield of 7.12 tons of alfalfa per acre under wheel traffic, compared to an average annual yield of 6.35 tons per acre from the other nine widely-planted varieties in the study. That's an average yield increase of 0.77 ton per acre per year compared to other varieties.

AmeriStand 403T's persistence carries through the winter months as well. The variety recently earned the highest winter-hardiness rating ever, and it was awarded a full-season "4" dormancy variety distinction in survival trials conducted by UW and the University of Minnesota. For more information contact America's Alfalfa at (319) 399-7081.

Hybrids now available

The world's first hybrid alfalfa — HybriForce-400™ — was unveiled in 2001 by Dairyland Seed Co. Inc. It offers hardier plants with better yields. In research trials, the hybrid vigor in the new variety showed an 8%-15% improvement in yield over current varieties. Spring growth and regrowth after cutting is also more aggressive in hybrid plants.

In 2003 the company released HybriForce™-420/Wet, a second hybrid alfalfa that carries a branch-rooted trait. This new variety is designed for poorly drained soils while still offering the additional benefits of increased hybrid vigor, more resilient plants and winter hardiness. HybriForce-420/Wet is also rated highly resistant to root rot, bacterial and *fusarium* wilt, and stem and northern root knot nematodes.

The HybriForce seed has been available in limited quantities. Dairyland Seed has licensed two hybrids to other companies. Journey 204 is co-marketed by Arrow Seed Co. Inc., Sharp Bros. Seed Co. and Fontanelle Hybrids. Phirst is marketed in the East by Doebler's Inc. For more information call Dairyland Seed at 1-800-236-0163 or see *www.dairylandseed.com.*

Better leafhopper resistance

When leafhopper-resistant alfalfa varieties were introduced in 1997, they fell short of growers' expectations. The glandular-haired varieties offered actual resistance levels of 35% at best, and their yields were marginal. But today, forage specialists say the newer generation of leafhopper-resistant varieties deserves a second look.

Many deliver at least 75% resistance, which allows for improved yield potential and savings on insecticide applications. During Ohio State University trials, glandular-haired varieties cut first-year yield losses by 82% compared to smooth, susceptible varieties.

Marc Sulc, an Ohio State University forage agronomist, says there's no way to predict leafhopper infestations. But, he says, the best way to control leafhoppers is to use insecticides, resistant varieties or a combination of both — especially if leafhoppers have historically been a problem.

New seedings are particularly sensitive to leafhoppers, so consider spraying first-year alfalfa at least once, even when a resistant variety is planted, Sulc suggests. That will ensure future productivity and yield potential of the stand for years to come.

Stand and regrowth traits

A reoccurring problem among alfalfa is lodging — when the plants bend over and flatten one another. When alfalfa lodges, several inches of stubble often remain in the field after cutting, which can reduce season-long tonnage. Lodged alfalfa is also more susceptible to leaf diseases and is typically wetter when cut, so it needs more time to dry in the windrow.

But a new class of alfalfa varieties, called

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StandFast, addresses the problem by claiming better standability and faster regrowth, which should translate to higher yields.

Developed by Cal/West Seeds, the StandFast varieties are a cross between European alfalfa varieties with high standability scores and U.S.-bred alfalfas. The fast recovery trait seems to be an added bonus attributed to the heterosis from those crosses.

The StandFast varieties score from 4.3 to 5.4 on a 10-point standability scale; whereas the best competitive varieties currently rank from 1.0 to 2.0 on the same scale.

The University of Nebraska and Penn State University have been field testing the varieties for the last couple of years, and researchers say, "They do stand tall and strong." The researchers also suggest that the StandFast varieties are well-suited for both haying and grazing.

Roundup ready in 2004

The commercial release of Roundup Ready® alfalfa is anticipated in early 2004. Forage Genetics Inc. of West Salem, Wis., licensed the Roundup Ready technology from Monsanto in 1998 and has been collaborating with Montana State University (MSU) researchers on developing Roundup Ready alfalfa varieties suitable for a wide range of growing conditions.

Once available, growers will be able to apply Roundup Ultra® herbicide to alfalfa to control broadleaf weeds and grasses. The seed has been in multiple field trials for seed production since 2001. Forage Genetics has licensed Roundup Ready varieties to several seed companies and plans to offer varieties adapted to climates from northern Minnesota to California.

Management mantras

Management can give alfalfa crops a boost as well. Here are practices for better efficiency:

► *Cut at the proper time.* Oklahoma State University forage agronomist John Caddel points out that alfalfa earmarked as feed for beef cattle needs to be managed differently than that for high-quality dairy hay. He says, "It is much less important to make hay with high protein concentration and relative feed value when it is to be used by beef cattle. Therefore, producers should not cut it at the late bud or early bloom stage of growth. Let it grow a week or 10 days longer, and let it reach 50% bloom, or even more, as long as most of the leaves are still attached to the stems."

Caddel adds, "Instead of targeting 20% to 22% protein needed for high-producing dairy cows, hay with 18% protein is adequate for stockers, and dry cows only need hay with 12% to 13% protein."

By delaying harvesting 10 days on each of the three harvests in a year, producers will gain a month — or about one cutting, Caddel says. He points out that total yield for the year will not be affected appreciably, but the cost of production will be reduced. "On average, equipment usage costs producers about a half ton of hay every time they harvest. So, what they lose in price of hay per ton, they can make up in reduced cost of production," he says.

In addition to decreasing production costs by fewer trips across the field, stands will probably last longer because of reduced demands on plants and reduced wheel traffic, Caddel adds.

► *Sulfur can increase yields.* Recent UW studies reveal that as little as 25 pounds (lb.) per acre of sulfur can increase first- and second-cutting alfalfa yields by as much as 20%.

UW soil scientist Keith Kelling says these yield increases are occurring on heavier silt loam soils. "Historically, our sulfur recommendations were limited almost exclusively to sandier soil types — the ones with low organic matter levels. But now we are seeing yield increases from sulfur on silt loam soils where the organic matter ranges from 3% to 4%," he says.

Researchers say the growing need for sulfur is likely due to clean air legislation. Power plants have cut back on sulfur dioxide emissions, so crops don't get as much "free" sulfur from the atmosphere.

To correct sulfur deficiencies in the year of application, Kelling recommends using sulfate forms like ammonium sulfate (21-0-0-24S). Sulfate is immediately available to crop roots, whereas elemental sulfur is not available until it is converted to sulfate. The conversion can take four to six weeks.

Utilizing ammonium sulfate instead of ammonium nitrate to fertilize corn silage and grass pastures can also offer an added boost. Both are popular nitrogen (N) fertilizers, but ammonium sulfate contains 24% sulfate sulfur.

► *Cut it short.* For the best combination of yield and quality, cut alfalfa as short as possible, according to a UW research trial. Researchers found that cutting alfalfa short can make a significant difference in yield without affecting quality.

In the first two years of the study, total dry matter yield from three alfalfa cuttings increased an average half ton per acre for each 1-inch (in.) reduction in cutting height. And the lower cutting height reduced relative feed value only slightly.

The results from UW are similar to a North Dakota State University (NDSU) trial that found significant yield gains from cutting alfalfa as low as 1 in. North Dakota researchers say the yield increase was due to increased growth from the stems originating from the crown rather than from axillary buds on the lower portions of the stems.

Overall, the researchers suggest leaving a 2-in. stubble when cutting healthy, unstressed alfalfa in spring and summer. Adjust the cutting height upward when the crop has been stressed by drought or flooding. If a fall cutting is taken, leave a 4-in. stubble to catch moisture.

Editor's note: *When selecting new alfalfa varieties, check with your nearest land-grant university for variety information to help facilitate your choices. You may also visit the North American Alfalfa Improvement Conference (NAAIC) Web site at* www.naaic.org *and link to its alfalfa variety field trial results under the "Information Resources" category.*