Is Improved Pasture Economically Viable?

Story by
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Baseball great Yogi Berra supposedly said, "It's hard to make predictions, especially about the future." But few crystal balls offer glimpses of a future offering cheap sources of energy. Last year's historically high prices for fuel and fertilizer may have provided a peek at what lies ahead.

That's not good news for managers of improved pastures. We're talking about pastures where "tame" grasses or other forage species have been introduced in order to increase the volume and quality of forage available for grazing. Generally, establishing and maintaining improved pastures requires fertilization and, depending upon the climate, irrigation. But producers and forage specialists are questioning whether the associated costs will become prohibitive. Some producers may have reached that threshold already.

Worth the cost?

Progressive and open to change, the Hamilton family added center-pivot irrigation to their Thedford, Neb., ranch more than 30 years ago. Replacing purchased protein supplements with homegrown alfalfa hay was the goal. Eventually, cool-season pasture was established on the more erodible irrigated sites where alfalfa yields were lowest. Irrigation dramatically increased forage production, and the pastured pivots lent greater diversity to the Hamilton operation.

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But things have changed again. As of last year, all of the ranch's irrigated ground was leased to an area corn grower. Dave Hamilton found it more economical to buy alfalfa hay than raise it. And the irrigated pasture really didn't make economic sense anymore.

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Hamilton does have mixed emotions about giving up the improved pasture and the management flexibility it provided. For example, he could "go to grass" earlier with part of his spring-calving cows, before the mostly warm-season summer range was ready. It saved the hay those cattle would eat, plus the cost of feeding it. After the first occupation and a period of rest, the irrigated pasture was grazed and subsequently rested twice during breeding season. It was occupied a fourth time, in the fall, by newly weaned calves. It proved to be a real asset during drought.

Climbing prices for fuel and fertilizer eventually overshadowed the advantages of irrigated pasture. In fact, total inputs for the pasture were about 50% more than for irrigated alfalfa.

"Granted, input prices backed off this year, but I don't think price volatility is likely to end," Hamilton adds. "I expect the general trend in energy cost will be upward."

Texas AgriLife Forage Specialist Larry Redmon has similar expectations. He urges managers of Texas grazing operations to consider whether their forage bases fit today's economics. This may be particularly important for graziers who rely heavily on improved pastures consisting of Bermuda grass. While they may not be dependent on irrigation to maintain these pastures, 50 pounds (lb.) of nitrogen (N) per acre is considered the minimum amount needed annually to keep Bermuda grass healthy and vigorous.

"Bermuda-grass varieties have been selected and bred to respond to fertilizer," Redmon states. "Bermuda grass needs fertilizer. But fertilizer costs have doubled in the last decade, and cattle prices certainly haven't done that."

If the price of nitrogen fertilizer remained at its current level, and prices for phosphorus (P) and potassium (K) retreated a bit, Redmon thinks well-managed Bermuda-grass pasture might work. It probably isn't sustainable, however, if fertilizer prices increase — certainly not if prices return to anywhere near the historic highs of a year ago.

"Unless you can fertilize for under $40 per acre, annually, I doubt it will work. And, if you quit fertilizing, Bermuda grass will decline, and your forage base will change over time," Redmon adds.

According to Eddie Funderburg,

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a forage consultant with the Noble Foundation, nitrogen fertilization for Bermuda grass, at this year's price level (around $400 per ton of nitrogen), is still economically viable. He thinks $600 per ton is the approximate breakeven price.

"Right now, if nitrogen is all you need, it probably will pay," Funderburg offers. "If potassium and phosphorus are required, especially on marginal land, it might be questionable."

The alternatives

Both Funderburg and Redmon advise producers to frequently do their own economic analyses and look to the future. Redmon thinks fertilization of Bermuda grass may be justifiable for hay production. For grazing, he says producers should start thinking about alternatives.

From East Texas across the South to Florida, low-input Bahia grass is worth consideration. Another option might be to return pastures to native warm-season species. They will yield less total forage, and stocking rates will have to be lowered, Redmon says, but total input costs will be much less.

According to University of Nebraska Forage Specialist Bruce Anderson, native warm-season grasses of the Central

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Plains will out-yield "improved" cool-season grasses in unfertilized situations. However, warm-season grasses typically provide high-quality grazing for only about four months. The availability of improved cool-season pasture, including smooth brome, orchard grass and others, allows producers to extend the grazing season without stockpiling forage.

Typical fertilization recommendations for improved dryland pasture, in Nebraska, call for 50 lb. to 90 lb. of nitrogen per acre. Application rates are highest in the East, where annual precipitation is greater. However, Anderson says inefficient forage utilization by grazing is a major barrier to economical fertilization. While a pound of nitrogen may stimulate an extra 15 lb. to 30 lb. of forage (dry matter), the portion of that extra production that is actually consumed by grazing animals varies from 20% to 80%. It takes a skilled grazing manager to achieve efficient utilization of improved forage production.

"Assuming nitrogen costs 'only' 50¢ per pound, the extra consumable forage produced using fertilizer costs from $333 per ton (20% of 15 lb. forage = 3 lb. for 50¢) to $42 per ton (80% of 30 lb. forage = 24 lb. for 50¢)," Anderson explains.

"Looking at it another way, using the previous figures, if a grazing cow-calf pair consumes 30 pounds (dry matter) per day, it can cost as much as $5 to as little as $0.625 per day. Typical pasture rent around here is about $1 per pair per day, so fertilization is economical for very good managers, but tremendously expensive for poor managers."

Grazing management plays a huge role in the profitability of livestock enterprises incorporating improved pasture.

Rather than shifting to native warm-season grasses, Anderson thinks many Central Plains producers should consider adding legumes to existing pastures. Including a significant nitrogen-fixing legume component can reduce or eliminate the need for expensive nitrogen fertilizer. Anderson's research in east-central Nebraska showed more than a $50-per-acre profit margin for legume/brome pastures compared to straight brome pastures receiving 50 lb. of nitrogen per acre, annually. Other research, Anderson says, suggests similar results can be achieved by adding legumes to pastures consisting of warm-season grasses.

The rising cost of fertilization is a concern for producers in the eastern U.S., too. At least it should be, says Jason Evans, a cattleman and assistant professor of resource management at the University of West Virginia's Davis College of Agriculture, Forestry and Consumer Science. Evans believes good records and accurate accounting for all expenses, including labor and opportunity costs, would show that many grazing operations utilizing improved pastures are not profitable. However, more area producers are using soil tests to determine fertilizer application rates and avoid waste.

Here, too, seeding legumes into improved pastures also helps reduce the need for nitrogen fertilization.

"We have the option of frost-seeding by broadcasting legumes and some grasses into existing pastures before the anticipated last frost of the year. It's a low-cost way to change pasture forage composition or renovate a stand without tearing up the sod," explains Evans, noting how the action of alternating freezing and thawing during late winter and early spring helps incorporate seed into the soil.

Like Bruce Anderson, Evans believes grazing management plays a huge role in the profitability of livestock enterprises

incorporating improved pasture. Producers in West Virginia and the surrounding region most commonly practice continuous or season-long grazing. Evans advocates a different approach to take advantage of the forage production potential of improved pastures.

"Intensive grazing is a more efficient management protocol that can be applied at relatively low cost," Evans says, referring to high-intensity, short-duration pasture rotation schemes. "Animals graze less selectively so they utilize more available forage, and pastures yield more with timely grazing and rest periods."

The future viability of improved pasture is a concern in the northwestern U.S., but with a different twist. Washington's Yakima County boasts some 130,000 acres of irrigated pasture, which, under the best intensive management, can produce 1,500 lb. to 1,600 lb. of beef per acre. According to Washington State University Extension Educator Frank Hendrix, a full fertilization program still offers an advantage when pastures are well-managed.

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"Last winter, I did the calculations, even figuring nitrogen fertilizer at $1,000 per ton," Hendrix says. "Even at that price, it was economically feasible. For every dollar spent on nitrogen, there was a potential return of $34 worth of forage."

It won't work, however, without irrigation. And energy for irrigation is inexpensive in the Northwest, compared to other parts of the country.

"Hydroelectric power does give us an advantage for now," Hendrix says. "That could change with cap-and-trade legislation. That could significantly increase the cost of energy here. Some people think it could double the cost. I don't know yet how that might affect the economics of irrigated pasture."

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Increasing challenges

Regardless of region and the forage species involved, Oklahoma State University Agricultural Economist Rodney Jones thinks many managers of improved pasture have long straddled the line between success and something less. Management skill makes a big difference. That doesn't mean those who cannot justify improved pasture are poor managers. Every operation is different; input costs vary by region, and management goals may be very different. However, the most successful managers of improved pasture typically view livestock as a tool for managing forage. Forage management is a priority, and they enjoy the challenge.

"It's definitely a challenge when nitrogen fertilizer costs 50¢ per pound, or more, and calves are worth a dollar (per pound). That just doesn't work as well as 25¢ per pound, for nitrogen, and $1.30 calves," Jones says.

"I can't put a timeline on it, because there are a lot of factors in play, but when the general economy improves, I expect fuel and fertilizer costs to increase again. Long-term, the cost of maintaining improved pasture is likely to go up, making the challenge even bigger."