



DISRUPTING PASTURE MANAGEMENT: THE PROFIT-PER-ACRE APPROACH

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THE IMPORTANCE OF ROI IN PASTURE MANAGEMENT

Pasture management is on the precipice of change. Healthy change. Think about it this way: Row-crop farmers can tell you how many bushels per acre they harvested and what each bushel is worth. Most have a good handle on their cost of production. They know whether a field or in some cases – a specific acre made or lost money.

To be sure, it's more complicated when raising and grazing cattle. Nevertheless, although most cattle producers likely know the current market price for a pound of beef, how many have analyzed how many pounds of beef their pastures yield or, more important, what it cost to produce those pounds?

It's time for a new mindset. It's time to approach cattle raising as a profit-per-acre business – and maximizing pasture productivity is a great place to start.

Adopting a Profit-per-Acre Mindset

Too often, pasture management is a turn-out-and-forget-it enterprise. A growing crop demands frequent scouting and fine-tuning throughout the growing season to reach its full yield potential. Grazing land is no different. A pasture can't achieve maximum productivity without a similar level of management.

To get the most out of grazing land, cattle producers need to intensify their management with the goal of producing more low-cost pounds of gain. This simple shift in thinking allows cattle producers to maximize their existing acres and increase the return on investment (ROI) from their pasture acres.

Feed is the cattle producer's No. 1 expense. Grazed forage is the cattle producer's lowest-cost feed source. Implementing practices such as sound grazing management, fertilizing according to soil test recommendations and managing undesirable broadleaf weeds and brush can directly benefit the bottom line of nearly any beef enterprise. Growing more forage and increasing pasture utilization are big steps toward becoming a profit-per-acre business and not merely a pounds-per-acre operation.

Pitfalls of Return-per-Cow

Economists typically calculate cow-calf budgets on a per-cow basis. The bottom line is profit or loss per cow. But if a producer narrowly focuses on the individual cow, there are potential pitfalls to profit.

One of those pitfalls is understocking, says Kenny Burdine, Ph.D., an agricultural economist with the University of Kentucky.

Cows in understocked pastures could show large returns per head but low returns per acre. A higher stocking rate may decrease individual performance but yield more total return.

Burdine suggests looking at production and profit on a per-acre basis. He recommends calculating returns on a per-head basis and then expressing the same calculations on a per-acre basis. Basing success on just one or the other could be misleading. He suggests a true profitability analysis for a beef enterprise should factor in all aspects of the operation.



EVERY DAY GRAZED IS MONEY SAVED

Extend the Grazing Season; Feed Less Hay

When cattle producers begin breaking down the economics of feed sources, they find pasture is the lowest-cost feed source available. It's estimated that grazing cattle costs around \$0.45 per head per day, whereas harvested hay or other stored feedstuffs costs as much as \$1.75 per head per day.¹ Spread that \$1.35-per-day savings across 100 cows, and it's easy to understand how a new emphasis on increasing forage production warrants the attention of cattle producers.

Any type of pasture management that improves forage production or pasture utilization will help save money at the end of the season. Consider, for example, potential added grazing days gained simply by removing low-value, undesirable plants:

- **Continuous grazing system**
 - Weed control = 30 days additional grazing
- **Rotational grazing system**
 - Weed control = 45 days additional grazing

This scenario assumes implementation of an effective broadleaf weed control program in a pasture that previously had 30% of its dry matter in weed pressure.

The Role of Soil Fertility

Hay production and continuous grazing systems deplete soil nutrients. Replacing these lost nutrients is essential for soil health. However, it's equally important to ensure those added nutrients go toward growing grass, rather than to feeding weeds. Effective weed control on fertile soil will improve forage production and increase pasture management flexibility for the cattle producer.

Fertile soil contains the major nutrients for basic plant nutrition, including nitrogen, potassium and phosphorus, which are important:

- **Nitrogen (N)**
 - Essential to photosynthesis
 - Makes up 16% of the weight of plant proteins
- **Potassium (P)**
 - N uptake and protein synthesis
 - Water relations
 - Disease resistance
 - Starch synthesis
- **Phosphorus (K)**
 - Harvesting and transfer of energy
 - Root formation
 - Seedling development

Most pastureland benefits from regular soil sampling. Land-grant universities and private companies offer soil analysis. Fertilizer retailers use those results to develop prescription fertility programs. The most effective programs include broadleaf weed control to ensure the greatest ROI.

¹Burdine, K. The Cost of Pasture versus Hay.
https://uknowledge.uky.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1035&context=ky_grazing



THE SIGNIFICANCE OF WEED CONTROL

Whether a cattle producer wants to restore trodden pastures or maintain a well-established grass stand, maximizing forage production begins with sound grazing management.

Broadleaf weeds and/or woody plants and brush generally indicate something is amiss in a grazing program. Evaluation and adjustment are the first step in pasture recovery. Along with being unsightly and undesirable, low-value plants often are more aggressive than important forage species, competing for light, water and nutrients. Herbicide applications can help speed the reset and return pastures to top productivity.

Extra forage can mean different things to different cattle operations, but there is a common thread: flexibility. Consider the options doubling or tripling grass production creates:

- **Increase carrying capacity.**
Expand the herd without adding acres.
- **Extend the grazing season.**
Shorten the hay-feeding season.
- **Reduce reliance on purchased feed.**
Grazed forage is the cattle producer's lowest-cost feed source.
- **Stockpile more standing forage.**
Provide low-cost winter grazing.
- **Put up more hay.**
Buy less winter feed; sell extra hay; or establish a drought reserve.
- **Rent fewer acres.**
Make existing acres more productive.





GAIN FLEXIBILITY WITH EXTRA FORAGE

It's simple. Grow a pound of weeds, lose a pound or more of grass. Control a pound of weeds, gain a pound – or more – of usable forage. If you consider the low-end pound-for-pound weed-to-grass conversion, a 100% increase in grass per acre means you're doubling your carrying capacity – compared with your once weedy pasture. A 200% forage increase triples your carrying capacity. In the calculations shown, outliers are omitted where weed control produced 13 pounds and 10.5 pounds of grass for every pound of weeds controlled. Without those, the average is 1.5 pounds of grass per pound of weeds controlled – a 150% increase.

INCREASE IN GRASS PRODUCTION AS A RESULT OF WEED CONTROL WITH A HERBICIDE: 25 TRIALS Forage Lb./A

State	Grass	Fertilized?	TREATED		UNTREATED		Weeds Controlled	Grass Increase	Grass yield per lb. of weeds controlled	Grass increase percent
			Grass	Weeds	Grass	Weeds				
MS	bermuda	yes	2906	323	756	1717	1394	2150	1.50	284%
MS	bermuda	no	1920	213	830	1893	1680	1090	0.65	131%
MS	bermuda	unknown	1937	141	692	1337	1196	1245	1.00	180%
AR	bermuda	unknown	8086	82	2893	5445	5363	5193	0.97	180%
TX	coastal	yes	4069	25	2124	1960	1935	1945	1.00	92%
TX	coastal/native	yes	8323	0	2587	7452	7452	5736	0.77	222%
TX	coastal/native	yes	7610	1494	2587	7452	5958	5023	0.84	194%
TX	coastal/native	no	4987	0	1385	4252	4252	3602	0.85	260%
TX	coastal/native	no	4898	1266	1385	4252	2986	3513	1.00	254%
TX	coastal/native	yes	2142	209	645	1698	1489	1497	*1.00	*232%
TX	coastal/native	yes	881	333	645	1698	1365	236	**0.17	**37%
TX	coastal/native	no	1330	202	377	1127	925	953	*1.00	*253%
TX	coastal/native	no	477	377	377	1127	750	100	**0.14	**27%
TX	N midgrass	no	3969	0	1726	1572	1572	2243	1.40	130%
TX	Klein	no	7443	65	5103	975	910	2340	2.60	46%
TX	Klein	no	2200	140	830	1200	409	3382	8.20	107%
TX	OW bluestem	no	5075	18	2842	746	728	2233	3.00	79%
TX	N shortgrass	no	1900	265	1200	2400	2135	700	0.33	58%
TX	N shortgrass	no	2720	0	1060	3040	3040	1660	0.55	157%
TX	L bluestem	no	9700	0	3250	3200	3200	6450	2.00	198%
TX	seed mix	no	4737	322	2800	1260	938	1937	2.00	69%
TX	bermuda	unknown	4682	0	1391	253	253	3291	***13.00	237%
TX	bermuda	unknown	4049	0	1391	253	253	2658	***10.50	191%
TX	bermuda	yes	6738	0	469	4384	4384	6269	1.43	1337%
TX	bermuda	no	3886	0	50	1980	1980	3836	1.94	767%

*Early application in a dry year
 **Late application in a dry year
 ***Outliers not included in yield calculations



WHY NOT MOW?

Time Efficiency

For producers looking to maximize their ROI, a timely herbicide treatment is the most cost-efficient method of weed control. Postponing herbicide application until later in the season allows for pasture weeds and brush to spread, becoming more established and harder to control.

Economic Breakdown of Mowing vs. Herbicide

Many producers turn to mowing as an effective method of weed control. Economic data has shown that one mowing can cost between \$15 and \$25 per acre, which is equivalent to, if not more than, the cost of a herbicide treatment.

To be at least somewhat effective at controlling weeds, mowing requires two to three timely passes per year, over a period of several years, to exhaust perennial weed carbohydrate reserves and seedbanks. However, a single application of a good residual herbicide can control weeds for many weeks – even months. With proper grazing management, forage grasses can then stay ahead of weedy competition.

And then there's the lost forage production. Mowing is not a selective practice. Certainly, it clips the weeds, but it also removes grazable forage.

Consider:

1 inch of grass removed = 100 to 400 lb. dry matter (DM)/A

Assumption:

250 lb. DM/A lost = 2,000 lb. (one large round bale) for every 8 acres mowed, or 10 tons on 80 acres.

MOWING CONTRIBUTES TO WEED INFESTATION THROUGH WEED SEED DISTRIBUTION AND FORAGE RESIDUE SMOTHERING FORAGES, PROVIDING AN IDEAL PLACE WHERE UNDESIRABLE SPECIES CAN ESTABLISH.



Swaths of cut vegetation pile on top of existing forage, suppressing, or in some cases killing, forage. These linear areas of suppressed herbage provide a perfect place for undesirable species to invade grasslands.

Gain Quicker Weed Control Through Combined Treatment

Liquid – and in select states, dry fertilizer – applied with herbicide lets cattle producers take care of pasture fertility and weed control at the same time. This means they only pay for one pass of treatment across a pasture. Since fertilizers are typically applied earlier in the season, producers can gain quicker control of weeds by combining soil fertility and herbicide treatments.



IMPROVE FORAGE AND LAND UTILIZATION

Chemical and Physical Barriers Cause Grazing Avoidance

Cattle tend to stay clear of weedy areas due to physical or chemical barriers, resulting in grazing avoidance. A physical barrier can be stickers, thorns or sharp spines that hurt a cow's mouth and nose. A chemical barrier can be a weed species that simply isn't palatable or – worse – is toxic. Some infamous weed species can drastically reduce grazing. For example, bull thistle. First, its prickly leaves keep grazing animals from sticking their noses in among its leaves to take bites of available grass. Research shows cattle avoid grazing within a 4-inch ring around the diameter of the thistle's rosette. Together, these avoidances in and around bull thistle can reduce forage utilization by 42%. Musk thistle hits utilization even harder with a 72% loss.²

Ungrazed Weed Island

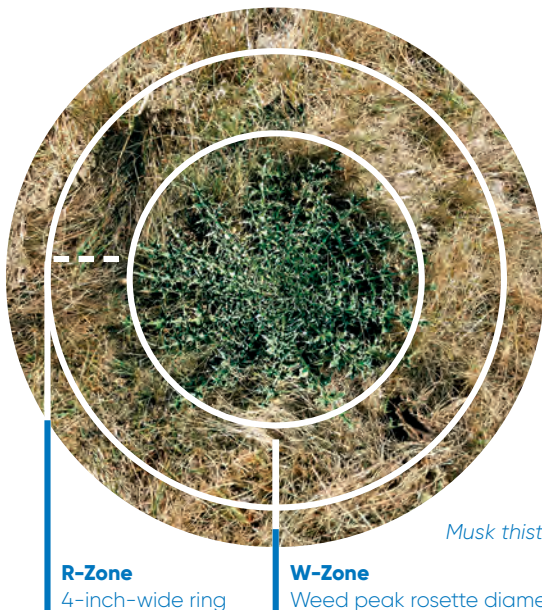


Figure 1.
Musk thistle rosette

R-Zone
4-inch-wide ring

W-Zone
Weed peak rosette diameter

Grazing and Decreased Land Utilization

When animals start to avoid areas because of weed populations, cattle tend to focus on and overgraze areas with better access to desirable forages, weakening those areas and creating new opportunities for weeds to encroach. Even relatively light weed infestations initiate change in the pasture – grazing avoidance leads to uneven grazing and poor utilization of forage. Left alone, broadleaf weeds gain a competitive edge and pasture decline continues. This helps illustrate the importance in addressing these issues early to prevent further decrease in grazable acres.

Patch grazing indicates:

- Low palatability of weedy species
- Animals expend energy in search of forage

Characteristics:

- Overgrazed patches
- Abundant weeds

MATURE WEEDS CAN REDUCE THE QUALITY AND PALATABILITY OF THE FORAGE AVAILABLE FOR LIVESTOCK GRAZING.

² Seefeldt, S. S., et al. 2005. Quantifying the Impact of a Weed in a Perennial Ryegrass-White Clover Pasture. *Weed Science*. 53(1): 113–120.



LET STRATEGY POSITIVELY AFFECT OUTCOME

Pasture management strategies aimed at providing an abundant forage base and maximizing land utilization help increase grazing while helping to reduce expenses. Sound grazing programs that emphasize forage availability and provide rest periods between grazing events can have a profound positive effect on forage recovery and competitiveness with weeds.

Poor grazing aids, mowing, shredding or limited weed control can impel weed encroachment by increasing the prevalence of exposed soil, which can be caused by:

- **Smothering forage with residue left from mowing.**
- **Overgrazing and selective grazing that thin grass stands.**
- **Environmental conditions during key forage growth and development periods that limit or slow regrowth.**
- **Inadequate fertility that limits the competitiveness of grass species.**

Thin, weak grass stands and bare soil also open the land to erosion and can create havoc with the grassland ecosystem, releasing a cascade of effects. Decreased plant diversity, sediment loading into streams and habitat degradation all negatively impact the cattle producer's stewardship goals. Effective grazing management, controlling undesirable plants and other practices help preserve the long-term viability of these natural resources while helping preserve and enhance a cattle operation's sustainability.

Advancing Pasture Weed Control

A highly anticipated broadleaf weed control product for pastures and rangeland, DuraCor® herbicide provides significant improvement in broadleaf weed control. DuraCor controls more than 140 weeds, and it does so at more stages of maturity than other pasture herbicides. That's especially important when protecting pastures and hayfields against ironweed or Canada thistle and other weed flushes that pop up after summer rains.

Powered by Rinskor® active, recipient of the 2018 Presidential Green Chemistry Challenge Award, DuraCor offers several important features, including:

- **Safe to desirable forage grasses**
- **Extended broadleaf weed control**
- **Flexible, low use rate**
- **Compatibility with dry and liquid fertilizer**
- **Low-odor formulation**
- **Nonrestricted use**



HELPING YOU OPTIMIZE YOUR ROI

Corteva Agriscience is the only integrated agriscience company completely dedicated to agriculture, as well as researching and developing products and solutions specifically for rangeland and pasture.

With access to a complete portfolio of products and support tools, our Range & Pasture specialists help deliver local, customized solutions for ranchers across the country.

At Corteva, our goal is to enrich the lives of those who produce beef and steward the land. The relationships we hold with ranchers is key to solving tomorrow's challenges. Our commitment allows us to help ranchers reach their goals – and optimize their return on investment.

Our Range & Pasture Portfolio

DuraCor™
HERBICIDE

DuraCor® herbicide

Extended control of more than 140 weeds, clearing the way for nutritious grasses to thrive and deliver greater productivity from every acre.

PastureGard® HL
HERBICIDE

PastureGard® HL herbicide

Pasture brush and nonresidual weed control with a single product.

Remedy® Ultra
HERBICIDE

Remedy® Ultra herbicide

The best tank-mix partner with DuraCor or Chaparral™ herbicide for mixed brush complexes. Remedy® Ultra herbicide provides convenient, flexible, long-lasting brush control.

Chaparral™
HERBICIDE

Chaparral™ herbicide

The simple answer for several significant, unique needs, such as reducing the impact of toxic fescue through seedhead suppression, and for controlling some of the toughest brush species.

LANDVisor™

LANDVisor™ advanced brush management

A digital support tool that combines sophisticated imagery, data, technology and expert guidance to provide confidence in land management decisions.

ProClova™
HERBICIDE

Coming Soon to Pastures:

ProClova™ herbicide

Nonresidual weed control that preserves white clover and annual lespedeza – and all their benefits.





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