

# GRAZING CROPLAND: PROFITABILITY



March, 2019

*by Matt Hagny*

There seems to be no abatement of the push to put livestock back on cropland, so let's dig a little deeper into the economics of this.

First, we can notice that rents for traditionally managed perennial rangeland are about 20 – 55% of what adjacent fields of cropland rent for, even when topography and soil types are the same. Rotational grazing, when intensively and skillfully applied, can eventually double stocking rates as the native plants improve their vigor (however, there's usually cost associated with this, such as developing water; at a minimum, there's more fencing and daily moving of stock involved). So, eventually, with rotational grazing, the rents on native range might be able to get to 40 – 90% of cropland. This is 'quick and dirty' evidence that livestock simply may not be as profitable as cropping as a general rule (i.e., they're not able to bid competitively against the grain farmers, so more pasture gets converted to cropland), although this may not hold true if well-chosen non-native perennials are used (more on that later). However, livestock producers aren't entirely crazy, as they usually incur less risk. Which makes sense: lower risk = lower returns (just like CDs or muni bonds vs tech stocks). Graziers might have to buy more feed or cut stocking rates during a drought, but their profits aren't quite as volatile as grain-only farmers (especially with the wild precipitation swings on the Great Plains), partly due to fewer inputs purchased each year.

Next, let's look at mixed enterprises—those that grow both crops and livestock. Again, they are less risky, partly from a portfolio-analysis standpoint (livestock prices negatively correlated with grain prices), but also just an averaging effect from the previous observation: livestock grazing as an enterprise isn't quite as risky as grain farming, so blending the two is less risky than grain-only. Mixed operations also typically have lower profitability versus the top 1% of either grain-only or livestock-only operations. As Terry Kastens has observed, mixed operations generally cannot pay the top rents that the better grain-only farmers can pay (Terry is a retired KSU Ag Econ faculty member, and active co-manager of a large grain operation in northwest KS—their farm was also heavily into cattle at one time). The mixed operations, being lower risk, simply cannot achieve top profits, and are limited in their growth (this has implications for the next generation returning to the farm—lower profits both per acre and in total, tend to cause the kids to be more likely to choose a non-farming career).

However, there are also efficiencies to consider: Blended operations are usually less efficient at one or both enterprises, simply because there isn't enough management (or attention span) to go around. This is especially true of operations with fewer than 5 full-time employees. Cell-grazing and the best practices of animal management have gotten no less sophisticated than grain farming in recent decades. It takes a heck of a lot of time to keep up with all the advances in either enterprise, let alone both of them. So, almost always, the blended operations, unless quite large and with sophisticated management, are lagging both the best grain-only farmers in the area, and the best grazing-only operators, in terms of output per acre. (For examples of mixed operations that quit livestock and went on to become truly stellar grain-only operations, [see my past newsletter on Grazing Cropland here.](#))

There's another major tension with blended operations: **In a drought, just when the cropping enterprise (and soil conservation) most badly need to keep every scrap of mulch cover, is the time when the grazer—short on feed—takes extra from the cropland to feed the herd.** This shouldn't happen, but it always does.

Faced between cutting the herd, or stripping the cropland of cover, the grazier chooses the latter. In this case, especially in drier environments, the profitability of the following cash crops is decimated, and the land subject to dramatically increased erosion (wind or water, or both).

### Tom Cannon's experiences

What about doing strictly forages on cropland? One or two seeding passes are involved, depending on length of growing season. As an example, let's turn to what Tom Cannon<sup>1</sup> of Blackwell, OK (north-central OK) is doing. Tom is both an expert crop producer, and cattleman—he grew up with both, and is undoubtedly a top-notch manager of both (he's been a longtime client of mine, so I talk to him a lot, and am always impressed by how professionally he manages both enterprises). A couple yrs ago, he went heavily into grazing forages (not crop aftermath) on a significant percent of his cropland, because he was able to get contracts for grass-fed/grass-finished beef. **Cannon says that without the grass-fed premium, the economic returns look terrible to grazing—worse than growing grain crops** (although cotton is proving a very profitable addition to his cropping menu). **Even with the grass-fed premium, cattle don't compete with a good soybean crop or a mediocre cotton crop**, says Cannon. He also says that grazing cropland is far more work than he ever imagined going in. For instance, in wet weather, he quickly gets the cattle off the cropland and onto perennials, since he doesn't want the compaction and seedbed irregularities from pugging (especially problematic for shallow-seeded cotton), and in cold weather, he's having to feed a lot of silage and hay to maintain gain when this happens. Silage is an inefficient process anyway (since 75% of what you're hauling is water), and not at all good for cropland—making it naked and vulnerable, as well as causing a lot of compaction.

Cannon went into cattle on cropland very enthusiastically 2 yrs ago, but is disillusioned now: **“The grass-fed gurus are making claims on gains per day that are way beyond what I'm able to achieve.” (And this from a highly skilled grazier!) Cannon had 1,000 stockers out on cropland last year (2018), but won't have any this year. As to his financial figures, he knows he has rock-solid data, and it has been analyzed by a professional third-party with no biases**—Cannon uses Mike Burtrum of Farm Data Services for this (Cannon already has a full-time accountant on staff, and keeps very detailed records including what labor goes to which enterprise). Cannon says that hiring Burtrum is absolutely the very best money he ever spent, as it takes all the emotion out of it—and he really values having the analyst (Burtrum) sit across the table from him and have the boldness to say when some practice or decision was stupid.

Cannon will still have cattle on the rangeland that his family owns, and may occasionally bring in some stockers on some winter forages or wheat, but not over the summer—“cattle just can't compete with soybeans or cotton.” He recognizes just how fiddly the whole thing is. Cannon is very meticulous about not letting any critters be out on the cropland when the soil is wet, even if that means he and his guys have to go move them in the wee hours of the morning when it's rainy and cold. He will not tolerate damage to the soil—*in the wettest spot in the field*, if the cattle are sinking 1” deep, they get pulled. And they don't go back out until it's sufficiently dry. “When you're feeding 60,000 lbs of silage every day, there's a real temptation to let them back out a day or two early.” Serious discipline involved, and he's extra careful in the spring as he cannot afford to mess up his seedbed for his cash crops. So, for Cannon to be able to do some grazing on winter forages (which otherwise would just be cover crops for him—they get seeded either way), a lot of other pieces need to fall into place, including getting someone else to produce silage for him so he can pull the stockers off the cropland if it gets wet.

### Pearce Farms' experiences

Nathan Pearce<sup>2</sup> and kin operate a large mixed operation mostly in Wallace County (far western KS). When the current generation took over from the previous one, they started with a great deal of family-owned pasture but expanded rapidly in cropland as well. Several years ago, they went whole-hog in the direction of grazing forages, partly because after the drought of 2012 they sold their cow herd (or most of it) and so were taking in cattle on a gain basis. They attempted to do the whole flash-graze program. The first year they did great and

sent Terry Kastens their analysis. Kastens cautioned them that nearly all of their very large reported profit was due to a favorable feeder cattle market price change (they were taking that risk). Kastens says, “I’m not sure Nathan believed me when I recomputed their profit assuming they had hedged their cattle. **But, 2 years later they completely abandoned the whole grazing cattle on forages program, citing labor and profit issues.” Pearce says, “We gave the whole grazing thing way more of a try than we should have.”** (And again, Pearces are good managers, and certainly not rookies when it comes to cattle and grazing.)

However, Pearces are innovative. They worked for several years and eventually secured a contract with the federal government to pay them to run abandoned horses and mustangs. This contract is paying better than any cattle-grazing program on their rangeland.

Pearce explains it goes beyond rangeland, however: “We are currently grazing 2,400 acres of [cereal] rye every year with the wild horses. We get about the equivalent income that we would from an average corn or milo crop, but it is way more reliable, since we don’t have to worry about making grain [in a drought- and hailstorm-prone area]. I guess it diversifies us a little. The horses pay way more than cattle ever would though. I would never steer anybody toward the horses, unless they are really good workers. We had to do a lot of improvements to our facilities, and the horses take a lot of work the first year or so.”

Pearce further comments, “A couple years ago I saw Gabe Brown talk, and he quickly skimmed over the fact that he is selling his cattle as grass-fed through a slaughter facility that he is part owner of. I think he’s done some really cool things with grazing, but **marketing of cattle you own is completely where you will make money. I don’t care if you use cells so small you move cattle 10 times a day—you will make all your money on how you sell those cattle. Custom grazing on a per gain basis is not likely to be profitable, and often a complete waste of time. What could you have made if it were in a crop like corn or milo that year? I have no problem with grazing growing forages, but all these no-till conferences are completely delusional about the economics.**” (Indeed, Cannon also emphasizes that people who think they’re getting ahead with cattle on annual forages on cropland aren’t figuring their opportunity costs. Or, I might add, perhaps don’t fully realize what their cropping profit-potential really is, due to inadequate cropping & management skills, or too much grazing on cropland over the years interfering with attaining top yields.)

### More examples

Terry Kastens brings forth another observation from a farm in northwest KS. “The [name stricken] are a very well-known family operation going back many decades. They had always had a mixed operation, mostly cropland but significant grass and also a feedlot operation. **Due to the sagging economics of grain farming the last few years, in 2018 this farm went whole-hog into grazing forages and paddock grazing—taking in several thousand steers on a payment per pound of gain basis.” At year end, the farmer acknowledged to Kastens that the program did not go nearly as well as anticipated. In particular, the forages did not provide the total animal weight gain per acre that was expected. Kastens says, “The irony was that 2018 was generally a great year weather-wise to raise forages for grazing.** So, all summer I kept repeating to our own employees that if a forage grazing program does not work around here in 2018, it likely will not work in a normal or a dry year. Open questions remain. First is whether the market for growing cattle would support this farmer increasing his charge per pound of gain to a point high enough to make the program economically viable. Second is **whether the large loss of [mulch] cover going into 2019 will hinder forage production in 2019 [and beyond] enough to imply even worse economics in 2019 than in 2018.”** (Kastens notes that their fields are nearly devoid of mulch cover due to aggressive grazing.)

### Other considerations

The damage to cropland from loss of mulch cover and livestock hoof compaction is very real. I know of a case near Grainfield, KS, where a parcel of cropland was divided into 4 cells, one was grazed far too much, two were

grazed moderately, and one not at all. *Seven years later, the yields still haven't recovered in the grazed areas! In dry or drought-prone regions, mulch cover is too crucial to let the livestock have it.*

Another phenomenon that I've noticed many times in the past 25 yrs of agronomy work in KS, is how much more N-deficient crops such as milo or corn are when grazing has occurred the previous fall or early winter (usually on crop aftermath, not living covers). Most likely this is due to increased denitrification, because the natural aeration of the soil has been greatly diminished by cattle hoof impact.

There are other issues related to the lack of mulch cover and hoof compaction in warmer climates—it can become nearly impossible to apply enough downforce on openers to maintain depth, which is especially critical for corn. For other crops, just getting enough seeds to moisture to make a stand can be far more difficult when grazing has occurred (and in more arid regions, relying on a rain to bail you out is a fool's mission). Plus, it's more challenging than ever to break up the sidewalls sufficiently for roots to grow through them and develop robustly (a major concern for corn, but also for other grass crops with crown roots). I've seen greatly reduced yields in corn from these phenomena when even 'light' grazing occurred the previous fall or early winter (on crop aftermath, not living covers).

What about all this soil health improvement from grazing living plants that we hear so much about? Yes, it's true that clipping and tugging on a living plant that is then allowed to recover does some important (and poorly understood) things to root exudates and may increase soil OM. But how much topsoil are you willing to lose in the process of doing that? And how much profitability? And if the grazing event impairs the ability to grow plants up to 7 yrs later, won't that impede soil OM accumulation worse than the grazing event helped it? (Quite likely, yes, it will.)

And what of the manure? We know that manure or poultry litter does wondrous things for soils, but this when applied at high rates from confinement operations—not simply converting part of the biomass produced in the field into manure/urine. I have observations spanning decades on grazing crop aftermath, and even in the Dakotas, the loss of crop yield from the loss of mulch cover and compaction far outweighed any gains from depositing manure. Yes, converting some biomass into manure probably increases soil OM slightly faster, but it's not enough to outweigh the detrimental effects of losing mulch cover and compaction. And the more fragile your soils, and the drier and warmer your climate, the more pronounced this is going to be. Processing biomass into manure in the field is penny-wise and pound-foolish, except in places such as ND and the Canadian prairies, where less mulch can often be a net benefit (and the soils are so spectacular that they can handle the hoof impact—much of which occurs during the 6 months of winter when soils are frozen anyway). In warmer climates, you simply don't gain enough benefits from processing biomass into manure (and/or changes in plant rooting due to grazing living plants) to make up for the loss of mulch cover and added compaction. (There are some exceptions to this in wetter climates, such as the eastern half of Kansas—on years where you get excellent growth of the cover, such as cereal rye ahead of soybeans, or pearl millet/sudan after wheat harvest, you can judiciously and carefully graze [leave at least half!] the living plants and usually not hurt anything.)

There are other examples from north-central KS, observed by myself and/or my clients, the essence of which are that these blended operations that are grazing cropland usually have some of the poorer crops (lower-yielding) in the area. (Some of these are producers who've been highlighted as speakers or panelists at meetings, and in the press—alas, the reality is seriously at odds with what is being claimed.) Whether their poor crops are from inadequate management (being spread too thin to do an above-average job growing the crops, or just not being very good with agronomic details), or due to compacting the soil and/or reducing mulch cover, we don't know. Suffice it to say that this phenomenon is further reducing profitability on the cropping enterprise, and further distorting what these mixed operations perceive as the true cost of running livestock. (However, I do know of one mixed operation in far north-central KS, near the NE border, Mr. Anonymous, who seems to be having some success with very careful grazing of living summer forages between his grain crops on occasion, as well as warm-season cover-crops [pearl millet, sudan, etc] after wheat. Although he says that over a long-term average, it may not be any more profitable than grazing perennials. And not significantly different from grain crops for

profitability for him, although less risky.)

The problem is extrapolating from the success that Gabe Brown has had in central ND (and various other cropland graziers in ND & the Canadian provinces) to warmer regions with more fragile soils and less ability to maintain mulch cover anyway (warmth = more decomposition). Gabe & others have created a highly successful system (**although be it noted that most of Gabe's grazing occurs on perennials [mostly non-native spp], not annuals**), but it doesn't translate into a universal rule that livestock must be on cropland everywhere.

The soils of KS, OK and other warm regions are generally much too poor to handle livestock impact when seeded to annuals. I visit northern SD every summer looking at my family's cropland and rangeland, as well as lots of time spent digging in my client's fields in KS. Suffice it to say that it's always shocking just how beautiful those glaciated soils of SD are in comparison to the crap that is KS farmland. A quarter-century of me observing both regions' soils, and it never ceases to amaze me just how much the Dakota farmers can get away with that would be disastrous in KS or OK or other southerly areas in the USA.

### **Grazing non-native perennials: Josh Lloyd**

On the fragile soils in warmer climates, especially on upland, it's really not practical or wise to be putting livestock onto cropland—except when it's been seeded to perennials. For those who have an aptitude for livestock, forget about grazing annual species—seed the field to non-native perennials for grazing. **Josh Lloyd<sup>3</sup> of Clay Center, KS (north-central) has been having some success with this, as his experience and calculations from the past 7 yrs show grazing on non-native perennials to be competitive with grain crops for profitability at today's grain prices** (and he's a competent no-till grain producer).

Lloyd has both a cow herd and long-hair sheep herd, which graze together—this increases slightly the lbs of meat produced per acre, since they eat a different spectrum of plants. He says that the sheep are actually more profitable than the cattle, but are also slightly more work. Lloyd says, “My first go at it was alfalfa, clovers, birdsfoot trefoil, chicory, fescue, festulolium, and a variety of perennial ryegrasses. I'm still learning with all this and how to best manage it. This past summer [2018] after wheat, I planted another field to a 'perennial break' and changed it up a bit. I'm getting ready to take the first perennial break back into [grain] production in a year.” The second field of perennial pasture was seeded to meadow brome, smooth brome, tall fescue, intermediate wheatgrass, orchardgrass, perennial ryegrass, chicory, plantain, sainfoin, alfalfa, white clover, red clover, birdsfoot trefoil. Non-legumes were seeded on 7.5”, and he then cross-drilled the legumes on 7.5-inch-spacing. The idea is to have 60% grasses, 20% legumes, and 20% forbs (non-legume broadleaf spp).

Lloyd's figures do not include any special premiums or marketing—just selling calves from his cow herd at around 500-lb weights, and using best management practices for livestock, which is rather minimalist by design (emphasizing culling rather than doctoring, etc). With the cool-season nature of Lloyd's non-native perennial pasture, he emphasizes the need to have some native (warm-season) rangeland to have a place to go with the livestock during the hot summer months (June thru September), when the cool-season species “sorta fizzle.” And he uses flash grazing, moving every day (“if they were farther from home, I wouldn't be able to move as often—maybe only every week or so,” which would increase his labor costs in traveling further, as well as decreasing his gains per day from less frequent moves). Lloyd does feed some hay on this non-native perennial break field when biomass is inadequate; the hay comes from the 125 acres of brome waterways on his other cropland (he hires the hay put up). Lloyd's profit figures from grazing his *native rangeland* during the summer months aren't pretty (much worse than grain crops), despite paying only 1/5th as much rent as his cropland. So, the blended average per acre goes way down (i.e., profit per acre per year from the 'perennial break' cropland averaged with the rangeland profit). Obviously this isn't a problem if you have access to rangeland near your cropland, but it's a major consideration in some areas—but *probably a better method anyway is to seed a nearby field (or part of the perennial break tract) to warm-season non-native perennial forages (although these take a lot longer to establish and reach full productivity versus cool-season non-native spp.)*. Another option is to de-populate your

livestock during the summer months.

**How scalable any of this is, Lloyd isn't sure. But it's intriguing for those who are hell-bent on putting livestock on cropland. It sure looks vastly better than trying to do it with annuals, not only from a land improvement standpoint, but also labor and inputs required (and not wearing out those expensive no-till drills).** *Indeed, there is precedent for this—the New Zealanders, who are truly the world's most advanced graziers, use only non-native perennials. The old Argentine system also used non-native perennials.* From an ecology standpoint, this makes perfect sense. While the native plant species comprising rangeland are the best-adapted to that scenario, they also are up against millions of years of pests and diseases co-evolving with them. It's no different than our annual crops. We have a lot of problems with pests and diseases of sunflowers, which are native to North America's Great Plains. In contrast, we have far less problem with pests and diseases of wheat, cotton & soybeans, which aren't native (granted, doing these for decades and centuries on end has selected for increasing pest and disease pressure, as those organisms adapt). If you suddenly start growing a crop from a different continent, you usually have almost no pest or disease pressure for the first few decades, or longer. Perennials are the same way—you want species that aren't native.

Indeed, our Mr. Anonymous in far north-central KS, has rangeland and some cool-season perennials planted on some cropland; he indicates that native can do quite well when managed appropriately, **but the non-native cool-season 'perennial break' still outperforms the native by 20% or more in productivity & profit**, and he's not even sure he got the cool-season planting halfway right: "I think I needed more diversity." However, he continues to graze some annual warm-season forages—grown between (and instead of) grain crops—since he thinks his soils improve the most under that regime versus anywhere else on his cropland, except what's in cool-season perennials. And yet that perceived soil improvement hasn't translated to yield gains in the following grain crops for him, perhaps because of some of the negative effects I've noted. And again, grazing the warm-season annuals isn't significantly more profitable for him than growing grain crops currently, and I rather doubt this grazing of annuals can be accomplished in many regions of KS and OK without seriously hurting the following grain crops, and/or inducing erosion.

**Returning to Josh Lloyd, who's ever-cautious about his conclusions, who says, "People need to realize that it's not a situation where you add livestock and the money rolls in—it's not a silver bullet." He continues, "But I believe at this point that adding a perennial break to my crop rotation and grazing livestock along with bale grazing is a way to build soil faster."** Lloyd says the livestock on non-native perennials look attractive at today's grain prices, and with less risk, although, "At some point I will have to decide if it's worth it—livestock tie you down, and you have to learn a whole new management system. At times I really question whether it's worth it." Although Lloyd sometimes grazes some cover crops in his cropland, it's only in certain niches when the opportunity arises, such as where he has cereal rye cover-crop planted ahead of soybeans, which needs to be there anyway for weed control, etc, and any grazing is just a bonus: **"Planting annuals for grazing in lieu of a cash crop is the least profitable—You better know your numbers if you don't want to go broke."** (And, unless extremely carefully executed, you will have far more erosion than with no-till grain production with all mulch retained.)

## **Final Remarks**

Those who claim to be achieving greater profitability with 'integrating' livestock with their grain operations in warm climates, were in many cases either subpar grain-only farmers to begin with, or are degrading their resource (i.e., causing erosion). This will cause some of you heartburn, and will cause others of you to hate me. Alas, truth does not vary according to our ability to stomach it. And if you've committed effort and resources to something, and openly stated your conviction (perhaps even as a event speaker or subject of an article), then it takes a great deal of courage to admit you were wrong. Children seem not to be bothered by being wrong; too bad we lose that as we mature—it gets in the way a lot. Hopefully you won't let pride, or stubbornness of needing to prove yourself right, get in your way of staying profitable and preventing degradation of the land.

And if you find yourself not doing well with either grain farming or livestock, there's no shame in quitting and doing something else. Indeed, you may find your life immensely more enjoyable, as well as more economically rewarding.

I've been warning about the hazards of grazing cropland in warmer climates in my [Crop Health Workshops](#) since at least 2014 (and [in recent newsletters, such as here](#)), and I've been getting more vocal about it as the pressure from certain speakers at other no-till events have pushed their livestock-on-cropland message harder. I often question my conclusions on any given topic, as I think a healthy skepticism is the only way to prevent us from deceiving ourselves. In writing this newsletter, I've discovered that the truth about grazing on cropland is even worse than I thought—I didn't have to seek out negative outcomes, they found me (indeed, what I discovered when I started asking around is often so much worse than I thought, for anyone who has all their costs accounted for). Thanks everyone for their contributions.

1 Although slightly dated (2008), you can [read more about Cannon's grain operation and no-till experiences here](#). Cannon has spoken at several No-till on the Plains events over the years, including an enthusiastic presentation on his embarking into grazing on cropland—which I suspect he now regrets. And it took extra courage and self-discipline for him to later conclude that he was wrong, and openly admit it—that the program simply wasn't working out like he had been led to believe (i.e., the gains/day weren't there).

2 More on [Pearces' grain farming and no-till practices as of 2011 here](#).

3 More on Lloyd's early no-till experiences and management thoughts [can be found here](#), from 2004. Again, it's somewhat dated and his cropping practices have evolved considerably. Scroll down—it's the last article in this pdf.