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# Grassroots

VOLUME 19 ISSUE 6

NOVEMBER 2017

## Range 101: The Wonders of Goats by Andrew Steffen

A cousin-in-law who I assisted owns pastures heavily infested with leafy spurge. While thousands of dollars in chemical applications each year have not been decreasing the amount of spurge, they are helpful in preventing it from spreading. After spending a few long days in the tractor spraying rough pastures, I thought there had to be a better way to manage this weed, and get a marketable product from it. Using prior knowledge gained in college and reading research articles, I decided multi-species grazing could be the solution.



Goats enclosed by electric netting fence taking care of leafy spurge (Photo: A. Steffen).



10 x 10 ft. lawn shed on skids to create a portable shelter for the goats (Photo: A. Steffen).

I purchased six various crossbreeds of meat goats. Not knowing much about goats, I thought it would be best to start small and test the theory. I selected ones that were low maintenance, mixed ages, and had good dispositions. My biggest concern was whether they could be contained by the fence. I used two sections of 42" tall electric netting and a solar energizer to create a portable pen that was just under 0.2 acres in size. After acclimating them to the fence and letting them eat down the Kochia in the corrals, I took them to a pasture.

I also provided them with a shelter using an old lawn shed and attached skids to pull it with an ATV.

Wonders of Goats Continued on Page 2



## Wonders of Goats Continued by Andrew Steffen

I moved the pen to a new spurge patch every 2-3 days. It would take less than 30 minutes to move by myself and even less time when my wife helped. The goats would strip all the leaves and seeds from the spurge, including the stem if it was a young plant. They would not eat the grass unless it was the only thing left. After the goats ate the thick patches of spurge, the cattle came through and eat grass in areas previously untouched. Most surprising was the damage they did to the small cedar trees. The goats would eat all the green off the cedar, eat some of the bark, and would rub their horns on the tree scraping additional bark off and breaking branches. They really started going after the cedars after a hard freeze. No supplemental feed other than loose mineral was given to the goats and they steadily gained solid pounds.

The spurge will likely never be eradicated, and will take many years of goat browsing to reduce the root storage of the plants. Rather than spending more money and time on spraying, the goats create the opportunity to take a weed and turn it into an additional enterprise for the operation. The goats escaped only three times – twice from cattle pushing into their pen and once from a storm that tipped their shed onto the fence. They were easily rounded up using cereal for treats and leading them back to the pen.



Before and after pictures of goats using pasture infested with leafy spurge. Goats well eating the spurge while leaving the grass (Photo: A. Steffen).



Before and after pictures of goats using a cedar tree during a cold period (Photo: A. Steffen).

*Andrew Steffen is Soil Conservationist for NRCS in the Burke Field Office*

# Can Prairie Dogs and Cattle Coexist? by Jamie Brennan

Few wildlife species are as controversial in rangeland management as prairie dogs. Prairie dogs reduce the carrying capacity of rangelands through consumption of forage and clipping vegetation to increase predator detection. Heavy defoliation tends to shift Northern Great Plains plant communities from midgrass dominance to shortgrasses intermixed with patches of annual forbs. While forage quantity is often reduced on-town, this may be somewhat offset by increased forage quality/digestibility. In order to better understand the impact of prairie dog towns on plant communities and livestock behavior and diet composition, a study was conducted by SDSU near McLaughlin, SD from 2012-2016.

Three 500-acre native pastures with varying levels of prairie dog occupation (0%, 20%, and 40%) were continuously stocked with yearling steers, June through October of each year. Stocking rates were adjusted to account for forage removed by prairie dogs. Plant community response was measured across four treatments: off-colony cattle excluded (NG), off-colony cattle grazed (CG), on-colony cattle excluded (PD), and on-colony cattle and prairie dog grazed (PDC). Averaged across years, August standing crop estimates (lb/acre) were 2239 for NG, 1770 for CG, 1141 for PD, and 918 for PDC. Results show a 50% reduction in biomass attributed to prairie dogs compared to non-grazed sites. On-town and off-town plant communities were significantly different every year, with forbs contributing more to overall biomass on-town versus off-town. These results indicate prairie dogs are the primary driver of change in production and composition.

Livestock behavior was determined using GPS collars, with grazing locations mapped onto plant communities delineated on maps derived from satellite imagery. Preferences were calculated for three major plant communities: grass dominated on-town (PDG), forb dominated on-town (PDF), and off-town (NPD). Results show yearly fluctuations in grazing behavior, with the general trend of decreasing preference for on-town locations throughout the year. Highest on-colony use tended to occur in June and July, dropping off in late-summer with little use by September. Forage quality and intake were measured using ruminally fistulated steers. Crude protein varied somewhat within years, but on average declined from June to August: 19.2 to 13.4 in PDF, 15.5 to 9.9 in PDG, and 12.8 to 10.7 in NPD. Intake was measured by combining intake rates from fistulated steers with time spent grazing based on GPS collars. While monthly and yearly differences occur, overall cattle diet composition on prairie dog colonies tends to be proportional to availability; 25% of the diet came from prairie dog towns in the 20% occupied pasture and 40 % on the 40% occupied pasture. Average daily gains (lb/hd/day) were lowest every year on the 0% occupied pasture: 1.6 for 0%, 1.9 for 20%, and 1.9 for 40% occupied pastures. While the diversity in diet on pastures occupied by prairie dog towns is likely contributing to increased individual animal performance, it is important to remember that overall production (lb/acre) was lower on prairie dog pastures due to reduced stocking rate.

Producers who manage pastures occupied by prairie dogs have difficult choices to make regarding maintaining high production and healthy grasslands. At low levels of colonization (< 20%), livestock production may only be minimally impacted by prairie dogs with possible improvements due to increased diversity in diet. Control efforts in these cases may not be beneficial relative to cost, especially if prairie dog towns occupy lower productivity sites. In pastures with high levels of prairie dog occupation, livestock production will likely be negatively impacted and grass resources overgrazed if pastures are stocked without regard to level of occupation. Finally, timing of grazing on prairie dog towns is important. Grazing early in the season (late May to mid-July) allows cattle to take advantage of higher protein content on-town.

*Jamie Brennan is Ph.D. student in the Department of Natural Resource Management and research technician stationed at the West River Ag Center in Rapid City, SD.*



## Mike McKernan: Making it Work with Cattle and Grass by Kate Rasmussen



Mike McKernan moving cattle to the next pastures (Photo: K. Rasmussen).

Mike McKernan and I make our way around the pasture to coax his horse herd into the corral. Mike is a retired Grant County Sheriff and walks with a quick, all-business pace. I catch my foot on a bowling ball-sized rock while doing my best to keep up and notice they're scattered across the entire pasture. "A person has to curse these rocks and thank them. This whole area would be farmed up if they weren't such a pain to move," he said as we walked the horses into the corals. The same glacial ice that once carried in the cumbersome stones left behind rich soil deposits, creating the productive land East River South Dakota is known. Mike grew up assisting his grandparent's farm nearby where his lifelong affinity for plants and animals began. He dreamed as a kid of working in the outdoors along side wildlife and cattle.

Mike lives in the prairie pothole region of South Dakota. The landscape is pockmarked with depressions that fill with rain and snowmelt and create productive wetlands. The region extends through four states and is home to over half of North America's migratory water-

fowl. Nearly 50% of these marshy wildlife havens have been drained to make way for land development. After watching much of this region change over his lifetime, Mike devoted himself to doing what he can to conserve this valuable landscape.

Inside the barn, we saddle the horses and Mike tells me how this job of taking care of Don Huls place made his lifelong dream of ranching come true. "I liked working on my grandparents farm as a kid but cattle and grass were my first love." Out of habit, Mike points out every bird and critter he sees as we make our way toward the cattle on horseback. The fast pace Mike maintained since my arrival that morning slows to a crawl as we start gathering the cow calf pairs. "I'm a big believer in going to tours and work shops. I went to a low stress stock handling workshop recently changed the way we work cattle here," Mike says as he eases his horse back and forth behind the herd. "It's important to always be learning something new—*especially* when it comes to working with the grasslands. Even if I've gone to a tour once before, I like to go again for a refresher because there's always something new to bring back and use here." He attended the South Dakota Grasslands Coalition (SDGC) Grazing School for the first time in 2007. He enjoyed the tour so much that he later became a SDGC board member as well as being the President of the South Dakota Division of the National Wild Turkey Federation, and serving on the board of directors for the Turn in Poachers program with Game and Fish.

**McKernan Continued on Page 5**

## McKernan continued by Kate Rasmussen

We work the cattle down the road, reigning in a few escapees before making it to the gate. Mike watches the herd amble through the gate and into fresh pasture like he'd rather be here than anywhere else. Back to business, we unsaddle the horses in the barn and load the pickup with mineral. Mike leaves the windows down as we gent onto the highway and I grab a laminated map from the dash before the wind sucks it out the window. The map shows five pastures divided into fifteen highlighted paddocks.

"The big pastures outlined there show how the place used to be set up. We broke them up with electric fence in 2012 after getting a NRCS grant to implement cross fencing," he said.

"What made you decide to change things?" I ask.

"The more I learned about grass management, the more I saw the positive changes I could make on this land. Going to tours and bringing back the things that could work here has made this place a different operation than it used to be," he says as he pulls off the highway into an paddock. "Whenever someone is thinking about going to smaller paddocks, I suggest these composite wood posts," he says.

"Why is that?" I ask.

Mike bends one of the posts all the way to the ground and it pops back up sending waves down the single high tensile wire. "They bend when wildlife need to cross and barely need maintenance. It's a good thing we switched to smaller paddocks. Our weaning weights have gone up every year—even in drought. Grazing in a smaller area makes it much easier to manage the grass."

We unload a few bags of mineral into tire bunks then walk out into the paddock to take a closer look at the plant communities. "We stopped spraying the leafy spurge about ten years ago when I noticed we were losing a lot of valuable legumes and forbs. Since then we started releasing beetles that eat the plant and it's really working," he says.

He leads me to a small fenced off plot of grass. The area inside is several square yards and was installed to observe the difference between grazed and ungrazed grassland. Mike points out that Smooth Brome took over most of the small enclosure while diverse plant communities grow everywhere outside of it. "The diverse plant communities not only give cattle better feed, but they give the wildlife—from song birds to soil bugs—a much better chance."



Mike McKernan looking over a grazing enclosure (Photo: K. Rasmussen).

*Kate Rasmussen is a freelance writer and ranch hand based near Belvidere, SD.*

## The Green Side Up: State School and Public Lands by Pete Bauman

### **Understanding Grazing and Access on State School and Public Lands**

Every year, some portion of state School Land leases are opened for public auction. These leases are managed as a 5-year base lease, with an additional 5-year renewal option. Prior to auction, a minimum bid rate is set based on the current cattle market. During the initial 5-year term, the lease payment is based on the actual competitive auction bid. However, during the second 5-year period, the lease rate is based on a set formula that depends on the cattle market and is non-competitive. Therefore, the rental rate for the second 5-year period can fluctuate from that of the first 5-years, and can be potentially less expensive.

### **How are lease auctions advertised to the public?**

Lease auctions must be announced at least four weeks in advance and are posted in mid-March on the School and Public Lands website and in the official newspaper for each county.

### **What other expenses does a lessee incur?**

Lessees are responsible for paying the annual property taxes on state School Land.

### **Can I install fences and water on State School Land?**

Generally, any infrastructural improvements such as fences and water development are the lessee's responsibility through a permitting process. Lessees can cooperate with outside agencies to fund infrastructural improvement projects. In all cases, the lessee essentially 'owns' the infrastructure and its value unless or until the lease changes hands. When state School Land goes to auction, the successful bidder usually incurs a one-time payment, often to the previous lessee, for the value of the infrastructure associated with the lease. The land auctioneer discloses this value. If the successful bidder and the previous lessee do not agree on the value, a third-party Board of Appraisal is appointed to mediate.

### **How many cattle can I graze if I rent state School Land?**

Stocking rates are suggested by the state School Land office at the time of auction on a price per animal unit month (\$/AUM) basis. Leases are structured to reflect a price per acre cost.

### **Can I sublease School Land?**

Generally, it is not legal to sublease state School Land to a third party. However, state law does allow for 'pasturing agreements'.

### **Can I break School Land for crop production?**

No. The office of School and Public Land has placed a moratorium on any conversion of School Land grasslands for crop production or other uses.

### **Is state School Land open to the public access for recreation or hunting?**

Yes. State School and Public Lands are open to the public, and the state retains the hunting rights for the public, which is written into the terms and conditions of the leases. Lessees cannot legally charge anyone for hunting or other access to state School Land and cannot receive any other compensation from hunting, including guide fees or other services.

### **How Do I access state School Land?**

All South Dakota School Land is public, but not all tracts have legal public access. The South Dakota Department of Game, Fish, and Parks provides excellent resources for accessing public lands in South Dakota, including state School Land. Visit <http://www.gfp.sd.gov/hunting/areas/maps/default.aspx> for access information. (Visit iGrow.org to view the full-length article).

*Pete Bauman is an Extension Range Field Specialist in Watertown, SD.*



# Bees Need Good Forage Too

by Garnet Perman

South Dakota is home to the largest bee keeping operation in the country. Adee Honey, a multi-generation family operation, works with over 90,000 hives. Most of them are situated in South Dakota over the summer months. For the winter, the hives are sent to California to provide pollination services for orchards and farms there. Adee Honey supplies Costco and several other major retailers with South Dakota produced honey. Honey production in the 1980's and 1990's ran about 120 pounds of honey per hive. Today 60 pounds per hive is the average. Queen bees used to live three to five years. Today, queens are fortunate to live for a year. Six to eight months is more common. When a queen dies, the hive usually does too, resulting in a 30-40% loss in the number of hives every year.

According to Kelvin Adee, a third generation beekeeper, the loss of native prairie plays a huge role in the challenges faced by the beekeeping industry today. Alfalfa, sweet clover and native wildflowers yield a mild flavored honey favored by consumers. The change from prairie to row crops has impacted the honey industry in two ways. The first is simply loss of habitat. With headquarters located in Bruce, SD, the area between Brookings and Watertown used to host large numbers of hives. As the number of native prairie and alfalfa acres diminished, Adee Honey cut back the number of hives in that area of the state and sought desirable habitat elsewhere.

Good bee habitat includes good forage: alfalfa, clover and wild flowers. A water source is a bonus, especially in dry years. Easy access from a highway or good gravel road is also important. According to SD law, commercial hives cannot be placed within three miles of other commercial hives. Backyard bee operations are not affected by the law. Adees usually place 40-96 hives in a given location.

With the increase in row crop production comes chemicals. The rise of colony collapse disorder, which results in considerable colony losses every year, coincided with the introduction of a particular type of insecticides known as neonicotinoids. Like nicotine, the neonicotinoids act on certain kinds of receptors in the nerve synapse. Neonicotinoids don't kill bees outright, but affect immunity and reproduction over time. Two new studies released this summer add to the evidence that neonicotinoids are detrimental to bees. A Canadian study indicates that neonicotinoids used in conjunction with fungicide increases toxicity by 50 %. Another study in Europe, where neonicotinoids have been banned since 2013, showed traces of the chemical in pollen gathered in areas that had not been treated with the chemical since then, indicating that neonicotinoids remain in the environment longer than expected (New Scientist, 29 June 2017).

Soybean yield increases with the presence of bees, however the neonicotinoid laced seed coating is hazardous to bees. Adee said that they've learned to place hives later in the season to avoid chemically treated seed. If a heavy insect infestation in a nearby field requires additional spraying, they will move their bees. Dicamba wasn't a big problem for them this year, however Adee anticipates continued use of the chemical will have a negative impact on their business. Adee Honey is always on the lookout for suitable habitat. Grass managers interested in hosting hives for the summer can contact Adee Honey at 605-627-5621. The company compensates the land owner in cash or in honey, whichever is preferred.

For those interested in assisting pollinators and other wildlife in general, Adee advised checking eligibility for assistance in establishing pollinator plots. SD Game Fish and Parks, Pheasants Forever, USDA Farm Service Agency, and the Natural Resources Conservation Service all have programs that offer financial incentives for pollinator friendly plantings.

*Garnet Perman is a freelance writer and ranches with her husband, Lyle, near Lowry, SD.*





Sandy Smart  
Box 2170, ASC 219, SDSU  
Brookings, SD 57007

## Calendar of Events

Event	Date	Location	Contact Person	Phone
Winter Road Show	Dec 11-15	Various Locations	Judge Jessop	605-280-0127
Annual Meeting	Dec 12	Chamberlain	Judge Jessop	605-280-0127
Dave Pratt Workshop	Dec 14-15	Belle Fourche	Judge Jessop	605-280-0127
SDSHC Annual Meeting	Jan 17	Watertown	Cindy Zenk	605-280-4190
NPSAS Winter Conference	Jan 25-27	Aberdeen	Jill Wald	701-883-4204

Please remit any comments, suggestions, or topics deemed necessary for further review to: Sandy Smart, SDSU Box 2170, Brookings, SD 57007, [alexander.smart@sdstate.edu](mailto:alexander.smart@sdstate.edu), (605) 688-4017