

## LIVESTOCK &amp; FORAGE GAZETTE



Published by the Livestock & Forage Gazette Committee - Volume 5 Number One  
 Return address - Saskatchewan Forage Council, 72 Campus Drive, Saskatoon, SK S7N 5B5  
 Publications Agreement # 40029311



*Producer Perspective: Cheryl, Ashley, Brian, Malorie and Amber Guenther (See page 2)*

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### EDITOR'S NOTE

With another winter nearly under our belts, our thoughts turn to successful calving seasons, warmer weather, spring rains and plans for the upcoming grazing season. In this issue we once again cover a wide range of topics and continue with our regular features including a producer perspective, updates on ongoing research projects and upcoming events to mark on your calendar. There are numerous livestock, grazing, and forage extension events hosted throughout the summer across the province and I encourage you to attend a workshop, tour or meeting that focuses on topics of interest for you.

Remember, give us a call or send us a note with any comments - the editorial committee always welcomes your feedback and inquiries. To be added to our mailing list, please contact the Saskatchewan Forage Council at (306) 966-2148 or [jbrunooghe@saskforage.ca](mailto:jbrunooghe@saskforage.ca).

Thanks are extended to all our contributors. Photo credits for this issue go to Stewart Brandt, Trevor Lennox and Cheryl Guenther.

Until next time,  
 Janice Bruynooghe  
 Livestock & Forage Gazette Editor

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## PRODUCER PERSPECTIVE:

### *Does Science Really Work in the Real World?*

*Submitted By: Janice Bruynooghe, PAg, Saskatchewan Forage Council, Saskatoon, SK*

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When Cheryl and Brian Guenther were married 25 years ago and their wedding present from Cheryl's parents included a couple of cows, you could say that the path was set for the direction that their life would follow. They started out buying a quarter section of land just south of Lanigan and with a herd of six cows. Cheryl recalls that after they paid off that first quarter of land they were out of debt for a total of one month and from there the journey began - and they haven't looked back for one second.

Today the Guenther ranch includes a much bigger cow herd and 35 horses, manages a total of 15 quarters of deeded and rented/leased land and boasts three daughters. Amber is 19 and enrolled at the University of Saskatchewan in the College of Kinesiology. Ashley (18) is completing her Grade 12 and Malorie is 15 and in Grade 9. All three girls own cattle and are active partners in the ranch. They are knowledgeable and accomplished when it comes to handling cattle and training horses - patterned after the skills employed by their parents. This is a family run operation with everyone having input and providing their opinion when it comes to decision-making. Cheryl and Brian have worked to build a business which can support their family and provide opportunities for the girls to return to the ranch "if that's where their dreams lead them".

The main cow herd is made up of 225 breeding females consisting mainly of Hereford, Simmental, Gelbvieh and Angus genetics. One of their management goals includes keeping the cowherd at a moderate size of 1200-1400 lbs with cows capable of weaning calves at 50% of the cow's weight. Calving began this year in early February but future plans include moving the calving date back to April 1st. A move to later calving is based on the desire to graze longer through the winter months and the need for less

labour as Cheryl jokes that "the girls are leaving home and we're getting old!"

Land resources include ten quarters of deeded land and rented or leased acres that fluctuate year to year based on demand and arrangements that can be worked out with neighbors. As well, 100

cow/calf pairs spend the summer in PFRA community pastures.

Grazing management plans are based upon proper season of use, carefully monitored levels of utilization and adequate periods of rest and recovery for pastures. With relatively marginal, sandy land, grazed forage species include quackgrass, crested wheatgrass, meadow brome grass, and native

pastures.

The Guenthers aim to keep their cows out grazing as long as possible. Hay fields are grazed in late October or early November, after hard frosts have caused plants to become dormant. Stockpiled grass, stubble and greenfeed stubble regrowth are all resources that are put to use to stretch the grazing season. In the past, swathgrazing has been used and grazing corn was given a one year trial. The result of this planning and flexibility has meant that most years, cows remain out grazing until mid-January when they are brought home for calving. Cheryl explains that they aim to extend their grazing season as long as possible in an effort to reduce labour, bedding and manure removal costs and "start the tractor less".

The use of electric fencing allows for flexibility in grazing rotations and the opportunity to rent land, often in short-term arrangements, as fences can be erected and removed relatively quickly and easily. The use of an electric fence roller on their tractor allows a quarter section of land to be fenced in an afternoon. The Guenthers appreciate the opportunity to access grainland for residue grazing and land owners value the flexibility of non-permanent fencing.



Cheryl credits many of their current management strategies and successes to the education and experience gained through off-farm employment. Trained as an Animal Health Technician, Cheryl's experience is "all cows" and the list of employers includes Pound-Maker AgVentures, University of Saskatchewan - Termuende Research Farm, Western Beef Development Centre and Golden Hill Cattle Company. She currently works from spring through fall as a pasture rider at the PFRA Wreford - Nokomis Community Pasture. "I can't say enough about what I've learned" through my job experiences, explains Cheryl. She lists a vast number of ideas and strategies that were learned through her work with researchers and employers and then implemented at home with their own herd.

Through Cheryl's association with researchers, veterinarians and scientists, the Guenthers have had the opportunity to work with and provide their cowherd as a study group for a number of research projects including vaccine trials, fly tag

evaluations and a western Canadian beef study investigating oil wells and animal health impacts. Who better then to pose the question to, "does science really work in the real world?" Cheryl Guenther's immediate response is "Yeah, it does! If we didn't have science and research initiatives we wouldn't know how to deal with changing issues. How could we get through challenges like BSE?" By adapting to change, being flexible in their management strategies and continually learning, Cheryl feels that they will continue to expand and "be in it for the long haul".

With goals of increasing their cowherd to 300 cows, further extending the grazing season, producing a quality beef product and maintaining a solid operation that can provide opportunities for the next generation, Cheryl Guenther is adamant that they are "living a dream - what better life could we have?" They are a family that truly works together, plays together (all are accomplished team ropers and horse trainers) and has a clear vision of what the future can hold.

### NOVEMBER 2005 TRIVIA QUESTION:

"Based on Western Beef Development Centre cost of production work, in 2004, what was the Average Total Production Cost per Cow for a surveyed group of top 25% low-cost producers in Saskatchewan?"

### ANSWER:

The Western Beef Development Centre compiles cost of production data as a means of analyzing participants' production costs and providing provincial industry benchmarks. The table below identifies the Average Total Cost/Cow for the study's top 25% low-cost producers in 2004 as **\$432.78 per cow**.

Trends identified included, low-cost producers:

- had above average herd size which allowed for the spreading of fixed costs

- had below average days on feed per cow, which resulted in below average yardage costs
- had below average direct costs, including winter feed/bedding, vet supplies, grazing, breeding stock, depreciation
- had below average 'Other Costs' which included interest and trucking/marketing costs.

*Thanks to Kathy Lang, Beef Economist - Western Beef Development Centre, for providing this information. For more information on the Cost of Production study, contact the WBDC at (306) 682-3139 Ext. 256.*

### Statistics on Top 25% Low-Cost Producers vs. All Producers in 2004 COP Data

	Top 25%	All Producers	Difference +/-
Average Total Costs/Cow	\$432.78	\$555.82	-\$123.04
Average Herd Size (# head)	385	303	82
Average Days on Feed/Cow (days)	131	173	-42
Average Yardage/Cow	\$81.70	\$132.82	-\$51.12
Average Direct Costs/Cow	\$344.88	\$409.25	-\$64.37
Average Other Costs/Cow	\$6.19	\$13.77	-\$7.58

# HOG MANURE EFFECTS ON FORAGE YIELDS

Submitted By: Stewart Brandt, Agriculture and Agri-Food Canada - Scott Research Station  
and Michel Tremblay, Saskatchewan Agriculture and Food, Regina, SK

A study examining the effects of liquid hog manure application on perennial forage was conducted from 2003-2005 at Agriculture and Agri-Food Canada's Scott Research Station. This study indicated that significant yield increases are possible on old forage stands with the application of hog manure or fertilizer.

The site was a 40 year old stand of smooth brome grass, crested wheatgrass, alfalfa, and other grasses. Treatments included 3 rates [3, 6 and 9 thousand gallons/acre] of hog manure applied in either early [May] or late [June] spring. An untreated

treatments.

Some damage to the forage occurred when applying the manure, with damage increasing with increasing rate of application and lateness of application.

Table 1 provides forage yields following one application of treatments.

Following the second application of hog manure or broadcast fertilizer, treatments that received 9000 gallons in year 1 and none in year 2, still tended to be highest yielding [Table 2]. The highest yielding treatment was where 9000

**Table 1. Forage yields (tons/ac) following one application of treatments, 2003-2005**

Treatment	2003	2004	2005	3 yr mean
Hog manure at 3000 gpa applied early*	0.66	2.08	1.83	1.53
Hog manure at 6000 gpa applied early	0.78	2.10	2.19	1.69
Hog manure at 9000 gpa applied early	0.83	2.15	2.58	1.85
Hog manure at 3000 gpa applied late*	0.51	1.94	1.34	1.26
Hog manure at 6000 gpa applied late	0.49	2.34	1.59	1.47
Hog manure at 9000 gpa applied late	0.59	2.49	1.56	1.55
Fertilizer N at 70 and P <sub>2</sub> O <sub>5</sub> at 35 kg ha <sup>-1</sup>	0.84	2.21	1.56	1.53
Check, no fertilizer or hog manure	0.58	0.86	0.67	0.70

check and a reference treatment with 62 lb/ac of N as ammonium nitrate, and 31 lb/ac of P<sub>2</sub>O<sub>5</sub> as triple super phosphate were included.

Treatment applications initially occurred in 2003 and were repeated on new areas in 2004 and 2005. As well, second and third applications, at varying rates, were applied in years 2 and 3 of the study as a means of evaluating the effects of repeated applications as compared to one time

gallons was applied late in year 1. It is possible that damage caused by late application of this high rate of hog manure limited uptake of nutrients the first year, leaving more for subsequent years. There was a general trend for yield to increase with rate of hog manure, but differences between early and late application were not as consistent as they were after the first occasion where hog manure was applied. This was likely because

**Table 2. Forage yields (tons/ac) following second application of treatments, 2004-2005**

Treatment		2004	2005	2 yr mean
Hog manure applied early*	3000 gpa yr 1, 3000 gpa yr 2	1.67	2.45	2.06
Hog manure applied early	6000 gpa yr 1, 3000 gpa yr 2	2.07	2.22	2.15
Hog manure applied early	<b>9000 gpa yr 1, 0 gpa yr 2</b>	2.08	2.48	<b>2.28</b>
Hog manure applied late*	3000 gpa yr 1, 3000 gpa yr 2	1.88	1.91	1.90
Hog manure applied late	6000 gpa yr 1, 3000 gpa yr 2	2.05	2.36	2.20
Hog manure applied late	<b>9000 gpa yr 1, 0 gpa yr 2</b>	2.22	3.19	<b>2.70</b>
Fertilizer N	N at 70; P <sub>2</sub> O <sub>5</sub> at 35 kg ha <sup>-1</sup> both yrs	2.04	2.31	2.18
Check	no fertilizer or hog manure	0.96	0.87	0.92

residual nutrients from the previous application were sufficient to avoid serious deficiencies until the current application could be accessed by the forage. Responses to broadcast granular fertilizer were similar to the mid rate of hog manure.

There was a general trend for the mid rate of hog manure or the broadcast granular fertilizer treatments to produce the highest yield in 2005 [Table 3]. The treatment that received 9000 gpa of hog manure early in the first year tended to be relatively low yielding. This may be a consequence of this treatment having high yields in previous years, and having depleted the supply of applied N and/or P. Annual applications of 3000 gpa did not equal yield from the same total amount applied as either 6000 + 3000 gpa or 9000 + 0 gpa in the first 2 years and none in year 3. This would suggest that it is preferable to apply large quantities of hog manure initially to revive an old forage stand such as this, rather than moderate amounts each year.



*Illustration 1. Appearance of treatments in late June, 2003 where granular fertilizer [70N, 35 P<sub>2</sub>O<sub>5</sub>] was surface broadcast compared with 9000 gpa of hog manure applied either in early May or early June 2003. (Note coulter and nutrient damage with June application of hog manure).*

**Table 3. Forage yields (tons/ac) following third treatments, applied during 2005**

<b>Treatment</b>		<b>2005</b>
Hog manure applied early*	3000 gpa yr 1, 3000 gpa yr 2, 3000 gpa yr 3	2.47
Hog manure applied early	<b>6000 gpa yr 1, 3000 gpa yr 2, 0 gpa yr 3</b>	<b>2.77</b>
Hog manure applied early	9000 gpa yr 1, 0 gpa yr 2, 0 gpa yr 3	2.26
Hog manure applied late*	3000 gpa yr 1, 3000 gpa yr 2, 3000 gpa yr 3	2.49
Hog manure applied late	<b>6000 gpa yr 1, 3000 gpa yr 2, 0 gpa yr 3</b>	<b>2.86</b>
Hog manure applied late	9000 gpa yr 1, 0 gpa yr 2, 0 gpa yr 3	2.77
Fertilizer N	<b>N at 70; P<sub>2</sub>O<sub>5</sub> at 35 kg ha<sup>-1</sup> annually all 3 yrs</b>	<b>2.80</b>
Check	no fertilizer or hog manure	0.86



*Illustration 2. Appearance on June 20, 2005 of the unfertilized non manured check treatment (left) and the treatment that received 9000 gallons per acre of liquid hog manure in May 2005 (right).*

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## MAKING LIVESTOCK HANDLING EASIER IN FORESTED PASTURES

*Submitted By: Ron Moss, Community Pasture A/Tech Transfer Coordinator, AAFC-PFRA and Allen Delorme, Producer, Foam Lake, SK*

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Managing forested pastures presents unique challenges. Trees become physical barriers and cattle can be difficult to locate and check. In addition, we don't always have the luxury of working with well mannered cattle on PFRA pastures. If we get cows that have run patrons around the manure pile instead of going where the owner wants, we will have our hands full trying to retrain these cows. The following are some of the things that various field staff has learned over the years.

### **Cow Psychology**

It is very important to "know" and be able to "read" the cattle you are dealing with. A good way to accomplish this is to work with these cattle every chance you get, such as:

- When holding cattle in corrals at delivery time, settle them by riding your horse through the herd until they feel comfortable and don't pay much attention to you.
- When moving cattle to a different paddock, settle them once you get to where you are going. You should ride through the herd (while others hold the herd together for you) until they are settled.
- When checking cattle, always be aware of what the cattle are thinking, and approach them from the proper direction. If needed, adjust your actions to keep the cattle from running off. If they do move away from you, just follow them to wherever they feel comfortable, and stay with them until they are settled.
- When you do move cattle, take into consideration which direction the wind is blowing; cattle prefer to walk into the wind and this may make it easier to move them where you want them.
- Sometimes you can catch either the cow or calf out in the open and use it as "bait" to catch the other.

**Homing.** This is the practise of placing cows in certain areas in relationship to where home is for them. This works good for moving cattle, or for controlling grazing in certain areas. Cattle have a very keen sense of direction and will be pulled towards home, even if they have been hauled to

a pasture.

**Dogs.** A good dog can save many hours when moving or gathering cattle. Cattle should be settled with dogs the same way they are settled with horses, as described earlier.

**Natural Barriers.** Mother Nature has put many natural barriers up for us to deal with. We should always be aware which barriers will help us and which will hinder us, when handling livestock.

### **Livestock Distribution**

- The first thing a manager has to do is ensure that there are adequate water facilities. This usually means dugouts in most of our bush fields. In some pastures, small lakes and sloughs may be dispersed through the pasture.
- One other conventional range tool to improve distribution is crossfencing, especially when fields are large. Crossfences enable you to control grazing in bush fields during summer, saving open holding fields for later in the year. It helps to have forested areas fenced separately from open areas - fencelines do not have to be straight!
- In some areas, mineral deficiency can be a problem. To ensure that cattle consume enough mineral, opportunities to move salt/mineral around to improve livestock distribution, may be limited. Otherwise, salt can be placed wherever needed to attract livestock to remote areas or fields, or through gates.
- One effective way to increase livestock distribution in bush fields is by clearing strips. Strips that are at least 400 feet wide seem to get more breezes, giving animals more relief from insects. It is important that the orientation of these strips be in line with the predominant wind direction. In the past, we have seeded strips with timothy, clover and smooth brome. There is some feeling that even if the seeding lasts only a few years, it provides something for the cattle to graze until other native species grow in. Aspen regrowth is also better controlled if there is a palatable species seeded that will attract them. Strips also provide an area where they can be easily checked.

Otherwise, it may be impossible to get much of a check in the bush.

### **Getting Cattle Out of The Bush**

Some cattle should never be placed in bush fields, simply because they are too difficult to handle. Some types of cattle (or certain herds) will not disperse well throughout bush fields. In contrast, easily managed cattle can be trailed through some really rough country.

Jack Townsend, a retired pasture manager, used to have a training period before cattle went into the bush. He rotated them through a couple of open fields first. He would go out with a truck, taking some bull pellets along. He would blow the horn and then feed them some pellets. It was said that he could move the cattle from one bush field to the other by blowing the horn; the cattle would come streaming out of the bush for the pellets!

Placing cattle in an open field before they go into the bush will allow you time for the cattle to get used to horses. It will also permit you to teach the cattle to “chase”. If cattle are used to being driven and have not been spoiled, they can be herded out of some difficult terrain. If cattle are properly trained (and they have never gotten the better of you), most times they can be moved through areas where you would not have a chance of stopping them if they wanted to get away.

- An area can be cleared in a corner of a field. It

will become a “sacrifice area” but it will provide an area for the cattle to lay out in the wind, and a place where you can check them or haze them out of a field.

- Put some quiet cows in with some wild or untrained cattle for the whole grazing season.
- Strategically placed “drift gates” work well when you have to move herds closer to home and you have some time. Once livestock have gone through the gate, they can’t go back. Moving a few calves through first (and maybe some salt) will encourage the cows to follow.
- Bigger herds (or higher stock densities) work better in bush pastures. If the herd is large enough to eat up most of the palatable forage in a short time, they will come out of the field easier. Conversely, if you have too small a herd in the bush, and if they have lots of available forage, they can be difficult to move.

In the end, it’s knowing what you have to work with, how to use what you have to your advantage, and being able to learn from your mistakes. Don’t be afraid to try new ideas and always give yourself plenty of time to get things done. “A cow can be a stupid animal, but you’d be surprised at how many times you can’t outsmart her!”

*For more information, contact Ron Moss at (204) 638-6108.*

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## **MARCH 2006 TRIVIA QUESTION:**

*Editor’s Note: In order to more efficiently provide practical and useful information, beginning with this issue of the Livestock & Forage Gazette, we will be providing our trivia question and answer simultaneously.*

“Which of the following winter hay-feeding methods results in the least feed waste?”

1. Feeding with a bale processor on the snow
2. Rolling out round bales on the snow
3. Processing round bales into a portable feed bunk

### **ANSWER:**

Research conducted by Alberta Agriculture in conjunction with the Western Forage and Beef Group at Lacombe, Alberta found that there was a significant difference in feed wastage between these three feeding methods. Feeding with a bale processor onto snow resulted in the greatest feed losses (19%) closely followed by rolling out bales onto the snow (12%). Processing dry hay into a portable feed bunk resulted in no wastage (0%). The feed losses were mostly due to feed trampling by the cattle. Losses were both in feed quantity and quality as the fine materials

(leaves) fell to the ground through the snow.

Work conducted at the Western Beef Development Centre near Lanigan, Saskatchewan, measured feed losses (residue) for two winter feeding systems including bale grazing and bale processing. In a bale grazing scenario, hay losses of 5% and straw losses of 38% were observed. Similarly, hay and straw fed on the snow with a bale processor resulted in losses of 8% and 40% respectively.

*For more information on these projects, visit [www.foragebeef.ca](http://www.foragebeef.ca) or [www.wbdc.sk.ca](http://www.wbdc.sk.ca).*

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## MARKETING YOUR FORAGE CROP

Submitted By: Trevor Lennox, PAg, Saskatchewan Agriculture and Food, Swift Current, SK

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*Author's Note: The rates mentioned in this article are based upon personal experience working in the forage industry. It is important that producers determine their own particular rates.*

When marketing forages, producers need to continually re-evaluate their marketing options in order to determine which is most profitable for their individual operation. When making forage marketing decisions, producers frequently become “blinded by production”, rather than focusing on profit in their management decisions. Unfortunately, producers have been programmed to think in terms of forage produced/acre or pounds/calf, instead of profit/acre or profit/cow.

As a die-hard forage producer, “the grass” becomes the management focus and decisions are made from the perspective of grassland health. Cattle are simply a “forage harvesting tool”. Rather than buy a forage conditioner and baler (which both depreciate) to harvest the forage, you are using “the cow” (which also depreciates) to harvest the forage. Some may argue that a cow does not depreciate, but we all know the difference in price between a bred heifer and a cull cow! For some producers, it makes sense to harvest the forage in the form of a bale, whereas other operations employ “the cow” as the harvesting tool, while other producers implement a combination of both methods.

Most producers are in the business of marketing their forage through their own cattle; however, producers do not have to own cattle in order to market a forage crop, as there are other marketing opportunities such as:

- standing forage;
- bales;
- pasture rental; or
- supervised custom grazing.

Some producers even choose to harvest seed first and then bale up the remaining residue.

The Saskatchewan hay market is currently flooded with most hay sold at less than the cost of production, once a return on land, labour and equipment is taken into consideration, along with the loss of soil nutrients. However, there are good opportunities to market forage through pasture rental arrangements or custom grazing arrangements, as pasture is usually in short supply most years. **A pasture rental rate usually runs between 60 cents to \$1 per day for a cow/calf pair, whereas supervised custom grazing averages between 80 cents to \$1.30 per day for a cow/calf pair.** With custom grazing, you are selling a service in addition to marketing your forage crop, which usually adds another 20 to 30 cents/day to the income from the forage. The service you are selling is your knowledge of pasture and livestock management. Producers who use management-intensive grazing principles will achieve the highest potential profit when they



custom-graze.

When marketing forage, producers have the choice of using their own livestock to market their forage, or use their livestock to market someone else's forage. Many livestock producers graze their own pasture land during the summer months and then purchase baled hay to feed their cows through the winter. This is acceptable, but producers aren't really marketing their own feed through the animals during the winter months; they are marketing another person's forage by feeding hay to their livestock. As long as the hay is cheap, this arrangement allows many livestock producers to run more cattle than their operations would normally carry.

The idea of buying hay to feed your cattle through the winter was challenged by a Cypress Hills rancher at a recent grazing conference in Saskatoon, who stated, "You are better off having fewer cows and grazing them all year, rather than having lots of cows and feeding more hay." His preference for running fewer cows is due to the following:

- less capital investment (less money tied up in cows);
- less machinery required (less iron and diesel fuel);
- less risk when the going gets tough (not always at the mercy of the weather to make management decisions); and
- less pressure on water resources (water systems and dugouts last longer).

The rancher stockpiles grazing resources during the summer months in order to graze the animals out on the range during the winter months. A key management decision was to move to a June calving season which forces

him to retain ownership of the yearlings. The running of yearlings is an important risk management strategy, as yearlings can be easily sold in the event of a drought. His experience has proven that the yearling market is far more stable in terms of price fluctuations through a drought than the calf market.

For those mixed farmers growing annual crops for grain, how are you marketing the crop aftermath? Is it marketed through your cattle, or to another producer (i.e. neighbour) who owns cattle? Many livestock producers are willing to pay their neighbours for access to cropland after the grain is harvested. **Depending upon the amount and quality of the crop aftermath, some livestock producers are paying 20 to 45 cents per day for grazing on cropland.**

In summary, a producer needs to realize that there are other ways than the traditional "bale" to market forage. It is important to re-evaluate one's marketing plan in order to achieve the highest amount of profit/acre. When a forage marketing plan involves another party (i.e. custom grazing), it is important to have a written agreement in order to ensure that each party follows through on their commitments.

*The author can be contacted at (306) 778-8294.*

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- Economics of raising beef

**For more information contact:**  
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or visit [www.saskforage.ca](http://www.saskforage.ca)

Canada Funding for this school provided by Agriculture and Agri-Food Canada's Greencover Canada Program. 

## THE SOIL FOOD WEB - THE KEY TO SUSTAINABLE FORAGE PRODUCTION

Soil organisms play a critical role in nutrient cycling. Not only are they responsible for decomposing organic matter, formation of soil aggregates, converting mineral nutrients to soluble forms, and adjusting soil pH; they are also responsible for nitrogen fixation, nitrification, phosphorus uptake, degradation of soil minerals, and formation of plant hormones. The **soil food web** refers to the network of dynamic interactions among these organisms as they decompose organic materials and transform nutrients.

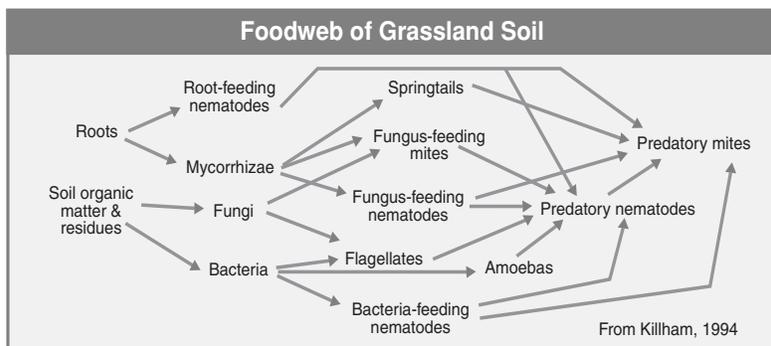
A healthy soil contains millions of organisms, ranging from visible insects and earthworms, to microscopic bacteria and fungi. An acre of living soil may contain 900 pounds of earthworms, 2,400 pounds of fungi, 1,500 pounds of bacteria, 133 pounds of protozoa, and 890 pounds of arthropods and algae, as well as small mammals. The term soil food web refers to the network of dynamic interactions among these organisms as they decompose organic materials and transform nutrients.

**Bacteria** - the most numerous microorganism in the soil. Every gram of soil contains at least a million of these tiny one-celled organisms. Bacteria decompose organic matter and require moist environments. Bacteria are also responsible for nitrogen fixation, soil aggregate formation, and detoxification of pollutants. (ie: *Actinomyces* - thread-like bacteria, which look like fungi. They are decomposers and responsible for that sweet, earthy smell of biologically active soil.)

**Fungi** - multicellular microorganisms that usually have a thread-like structure. Mycorrhizal fungi form extensions on roots, increasing their ability to take up nutrients and water. They also transport nitrogen from legumes to grasses. Yeasts, slime molds, and mushrooms are other species of fungi.

**Algae** - microorganisms that are able to make their own food through photosynthesis. They often appear as a greenish film on the soil surface following a rainfall.

**Protozoa** - free-living animals that crawl or swim in the water between soil particles. Many soil protozoa species are predatory and eat other microorganisms. By feeding on bacteria they stimulate growth and multiplication of bacteria and the formation of gels that produce soil aggregates.



**Nematodes** - small, wormlike organisms that are abundant in most soils. Most nematodes help decompose organic matter. Some nematodes are predators on plant disease causing

fungi. A few species of nematodes form parasitic galls on plant roots or stems, causing plant diseases.

**Earthworms** - multi-cellular organisms that decompose and move organic matter through the soil. Earthworms thrive where there is little or no tillage, especially in the spring and fall, which are their most active periods. They prefer a near neutral pH, moist soil conditions, an abundance of plant residues, and low light conditions.

**Other species of soil organisms** - Many other organisms, including dung beetles, sowbugs, millipedes, centipedes, mites, slugs, snails, springtails, ants and birds facilitate nutrient cycling. They make residues more available to smaller organisms by breaking them down physically and chemically and by burying them in the soil.

**Soil health** refers to the ability of soils to function as a productive environment for plant growth, an effective filter, and an efficient regulator of water flow. Soil mineral type and chemistry form the basis for soil composition and soil health. However, much of soil health and function depends on an active community of diverse soil organisms. Nutrient cycling, aggregate formation, degradation of toxins, creation of soil pores, and absorption of water and nutrients are all functions of soil organisms.

*This information reprinted from [www.foragebeef.ca](http://www.foragebeef.ca).*

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# Research Roundup

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## NATIVE SPECIES SEEDING UPDATE

*Submitted By: Ross MacDonald, PAg, Ducks Unlimited Canada/Saskatchewan Watershed Authority, Weyburn, SK*

From Redvers to Eastend, producers are trying something new in forage establishment and grazing. A demonstration project highlighting the establishment and use of a seed mixture containing green needlegrass (GNG), northern wheatgrass (NWG), western wheatgrass (WWG), little bluestem (Ltl bluestem) and alfalfa is well underway. Approximately 300 acres of this seed mixture will be up and growing in the spring of 2006.

Project partners include the Green House Gas Mitigation Fund (administered through the Canadian Cattlemen's Association), Proven Seed, Dow Agro Sciences, Ducks Unlimited Canada, Saskatchewan Watershed Authority, Saskatchewan Agriculture and Food, Agriculture and Agri-Food

Canada-Semi-Arid Prairie Agriculture Research Centre and land owners near Eastend, Moose Jaw, Craven, Weyburn and Redvers.

Together, the partners will demonstrate the ability of a native grass species mixture to establish on cultivated soils across the Province. This mixture will promote biodiversity and potentially improve carbon sequestration potential of each site. Grazing these locations is also expected to demonstrate that improved forage quality throughout the grazing season can mitigate greenhouse gas emissions from cattle. Incorporation of the cool season (GNG, NWG, WWG) and warm season (Ltl bluestem) grass species will provide digestible forage throughout the grazing season.

Stay tuned for more details and site profiles.

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## WHY ARE TAME HAY YIELDS DECLINING IN SASKATCHEWAN?

*Submitted By: Paul G. Jefferson and Fernando Selles, Agriculture and Agri-Food Canada  
Semiarid Prairie Agricultural Research Centre, Swift Current, SK*

The Saskatchewan provincial average tame hay yield increased from 1967 to 1980 but has been declining since then (Figure 1). Yield data includes average hay yields, as reported by producers and reflect "on-farm" yield. In comparison, the annual provincial average grain yields of spring wheat, durum wheat, barley, and canola in Saskatchewan have been steadily increasing since 1967. We examined weather and statistical data to explain this hay yield decline.

We calculated provincial average rainfall and temperature for April, May, and June from 16 weather stations across the province. However, the decline in hay yield was not related to any changes in weather.

The Saskatchewan beef cow herd has been increasing since 1985 and has recently reached a number not seen since 1975. As the cow herd grew, there has been a decline in average hay yield for the province. The more cows on farm, the more hay is typically required for winter feed, even if the yields are low.

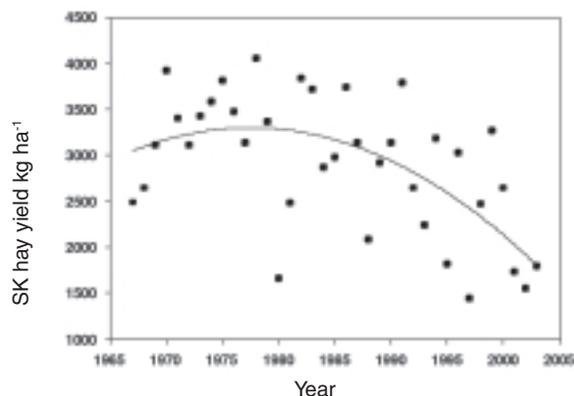
Older fields of tame hay tend to be lower yielding than newly established fields. Hay fields are seldom fertilized so declining hay yield with declining soil fertility usually occurs in old hay fields. As demand for hay increases, the stand life of hay fields may be extended despite declining production.

The acreage of hay has increased since 1980.

Much of this increase was targeted on marginal crop land as a soil conservation initiative. Since forage production would be similarly limited by problem soils, we speculate that these programs have contributed to the decline in average tame hay yield.

More hay stand rejuvenation is needed and a government policy change to support seeding forages on more productive soil types is needed to reverse the decline in hay yields. Saskatchewan needs more hay acres than ever before to support the post-BSE-crisis beef cow herd.

*Paul Jefferson can be contacted at (306) 778-7252.*



**Figure 1.** Saskatchewan mean tame hay yield by year since 1967.

# Upcoming Events

## Seeding Native Forages Field Day

May 2006  
Swift Current, SK  
Contact: Trevor Lennox  
Saskatchewan Agriculture and Food  
Phone: 306.778.8294

## Saskatchewan Pasture School

June 14-15, 2006  
Saskatoon, SK  
Contact: Saskatchewan Forage Council  
Phone: 306.966.2148

## AAFC/SPARC Forage/Grazing Field Tour

June/July 2006  
Swift Current, SK  
Contact: Saskatchewan Agriculture and Food  
Phone: 306.778.8294

## Native Prairie Appreciation Week:

### Exploring The Matador Grasslands Area

June 21-22, 2006  
Beechy, SK  
Contact: Michel Tremblay  
Saskatchewan Agriculture and Food  
Phone: 306.787.7712

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*The Committee thanks the contributors and funders that made this issue possible. Please contact committee members if you have ideas for future articles - the next issue will be published in November 2006.*

Canada

Funding for this project provided by  
Agriculture and Agri-Food Canada's  
Greencover Canada Program.



Government of  
Saskatchewan

**Publications Agreement # 40029311**

Return undeliverable  
Canadian addresses to:  
Saskatchewan Forage Council  
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Saskatoon, SK S7N 5B5