MONTANA STATE UNIVERSITY | EXTENSION July 2010

Cultivating Knowledge on the Flathead Reservation

# Flathead Reservation Extension Newsletter

## Forage and Nutrition—*A word from Rene*

### HAY SAMPLING ACROSS THE FLATHEAD RESERVATION

Establishing a feeding program begins with forage analysis. Forage quality is defined in various ways but sometimes poorly understood. I'll talk more about that in my August newsletter. Forage quality represents a simple concept, yet encompasses much complexity. Often, forage quality receives far less consideration than it deserves. So, let's give forage quality some thought. Among other things, forage quality includes palatability, intake digestibility and nutrient content. But you know that animal performance is the ultimate test of your forage quality. This fall the Flathead Reservation Extension Office **will pay for sampling** first and/or second cutting grass hay and/or alfalfa hay in **ten** locations. **If you would like to take part in this year's sampling please call me at 275-2756**. Results will be shared in my newsletter. Participants will be assigned a sample number and all participant names will be kept confidential. Each participant will receive a copy of their forage analysis and assistance in interpreting the lab report. The analysis will include:

| Feed Analysis | | | |
|---|---|---|---|
| Complete Mineral | | Relative Feed Value | |
| Sulfur | Manganese | Moisture | Neutral Detergent Fiber (NDF) |
| Sodium | Phosphorus | Relative Feed Value (RFV) | Total Digestible Nutrients |
| Potassium | Copper | Acid Detergent Fiber (ADF) | |
| Iron | Magnesium | Crude Protein | |
| Calcium | Zinc | | |

If you are interested in participating in forage analysis, please note, forage species, date of your first cutting, approximate time of day cut, the stage of maturity of the grass and/or alfalfa when cut, and the date of baling. Please also note any adverse conditions during or after cutting, such as rainfall.

- The stage of maturity refers to a plants stage of development. For grasses this may be boot stage (grass flower head enclosed by sheath of upper most leaf), early heading, fully headed, early bloom, full maturity (plump brown seeds that shell out easily from dry, whitish glumes or chaff). Harvesting at different stages will affect hay quality for grasses and legumes. In cow-calf beef operations, premium quality hay is often sacrificed to obtain higher yields by harvesting at later stages of maturity. According to Cash and Bowman (1993) as alfalfa plants mature from vegetative stage to reproductive stage, fiber content increases and protein content and digestibility decrease.
- Daily fluctuations (time of day) affect forage quality. Plants accumulate soluble carbohydrates during the daylight and use them overnight. Thus, soluble sugars are lowest in the morning and highest after a day of sunshine. In low rainfall climates, study results show higher forage quality when alfalfa is harvested in the late afternoon rather than in the morning.

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***INSIDE THIS ISSUE:***

Around the Flathead Reservation most first cut hay is baled and stacked. In case you are thinking of leaving that first cutting in the field for a prolonged period, here's a tidbit from Dr. Bruce Anderson, Professor of Agronomy, Agronomy & Horticulture, University of Nebraska - Lincoln, Lincoln, NE [July 6th, 2010]

**Bales and stacks of hay left in the middle of fields** have to be removed sometime. After the final cutting for the year, it may not matter too much if they set there for a while. But when more harvests are expected off that field, delaying removal can be harmful.

One problem is directly under the bale or stack. Plants underneath often are killed if covered for more than a week or two. This may not hurt yield too much, but makes for a great place for weeds to get started. And you know how they can spread.

Most of the damage, though, is due to wheel traffic on the regrowth. Studies have shown that when fields are dry, plants driven on before regrowth occurs yield about 5 to 7 percent less at next cutting. It gets much worse if you wait to remove bales. Just seven days after cutting, when regrowth shoots had started to grow, yield was reduced over 25 percent and fewer of these plants survived. And worse yet is removing bales when fields are wet. Then wheel traffic causes much more compaction. When this happens, yield loss typically exceeds 30 percent. These studies emphasize the benefits of baling and removing bales from hay fields as quickly as possible after cutting as well as minimizing driving on wet soils. They also suggest that following the same trail when removing bales or stacks from fields can reduce losses from wheel tracks by limiting the total area damaged. Hay fields must be driven on, of course, to remove bales after harvest. But you can lessen damage by controlling where, when and how often you drive.

## Cropland

### Keeping Nitrogen in the Soil and Out of the Water

Nitrogen is important for optimal crop production, but can be lost to leaching as nitrate. High amounts of nitrate in drinking water can be harmful to people, especially infants and pregnant women. While most groundwater in Montana has nitrate levels below the drinking water standard, the Montana Department of Agriculture has found high nitrate levels in certain areas of the state.

Fortunately, "there are management practices that can help keep the nitrogen in the soil and out of the water," said Clain Jones, Extension soil fertility specialist in the Department of Land Resources and Environmental Sciences (LRES) at Montana State University. In Montana, nitrate leaching from dryland agriculture is thought to be insignificant during the growing season because plant uptake of water generally greatly exceeds precipitation, preventing downward movement of water. However, in fall and winter the opposite is true, resulting in increased potential for nitrate leaching. In addition, overwinter organic matter decomposition can add soluble nitrogen to the soil, increasing the amount of soil nitrate available to be leached. This is not only a health concern, but a direct financial loss to the producer.

Shallow or sandy soils or those with cracks that connect the surface to below the root zone have high leaching potential. High precipitation can exacerbate the problem. In a wet winter, soil nitrate levels decreased by up to 25 pounds of nitrogen per acre from fall to spring. Actual nitrogen lost to leaching was likely higher because soils at this site

can gain up to 40 pounds of nitrate per acre from organic matter decomposition over the winter. This suggests a total of up to 65 pounds of nitrogen per acre could leach into groundwater from shallow soils. Annual soil testing and realistic yield goals should both help producers calculate fertilizer rates and reduce nitrate leaching, since unused available nitrogen is subject to overwinter loss. Illustrating that either the crops use it, or you can lose it.

"Recropping, rather than fallow, and reduced tillage both help reduce nitrogen losses," said Jones. Planting a diversity of crops, including perennials and deep rooted crops, such as alfalfa, sunflower and wheat, or a winter crop, helps ensure readily available nitrogen is used and harvested or held on site as plant biomass. Jones suggested planting annual legumes for seed or forage "they are good scavengers of available nitrogen and they do not

need nitrogen fertilizer as long as sufficient phosphorus, potassium, sulfur and the correct inoculants are available for nitrogen fixation." Jones also noted "spacing crops for optimal density and yields will optimize resource use, and decrease potential for nitrogen leaching."

Ideally, conventional nitrogen fertilizer is applied right before the plants need it most, which is from seedling to tillering stages in cereal grains and seedling to early branching in oilseeds. "This can be followed by in-crop fertilizer topdress applications based on plant demand or growth stage, rather than calendar date," said Jones. "By using such split applications, there is less potential for over fertilizing during a dry year, because nitrogen applied is based on the current year's growing conditions. That leaves less unused nitrogen in the soil to be subject to leaching."

"There are also advances in fertilizer and application technology that help increase the amount of applied fertilizer actually used by the crop, which decreases the amount of fertilizer susceptible to leaching," said Jones. Enhanced efficiency fertilizers slowly release their nutrients over time. Recovery of nitrogen fertilizer by wheat has been found to be 4 to 14 percent higher with one of these slow release products than conventional urea. "These deserve consideration, especially as the price difference compared to conventional urea fertilizers decreases," said Jones. "But, timing of application is a little different than with conventional fertilizer," he cautioned.

Variable rate application is another tool to help ensure nitrogen is applied where it is needed most and not in places where it will be lost. By identifying areas in the field that are limited by factors other than nitrogen, the producer can limit nitrogen leaching loss by applying just enough nitrogen to meet that area's production potential. By using available technology and management practices, producers can make sure their fertilizer dollars are spent feeding a crop, rather than lost to leaching, and can help reduce the potential for nitrate contamination of ground water.

MSU Extension information on enhanced efficiency fertilizers (http://landresources.montana.edu/SoilFertility/PDFs/EEF720.pdf and water quality considerations and regulations http://landresources.montana.edu/nm/Modules/NM12layout.pdf), among others. For information on well or soil testing, contact the Flathead Reservation Extension Office at 406-275-2756 or 406-675-2700 ext 7375.

## Manure Management

Manure is a reality if you keep animals, and it can be an asset or a liability. Management determines which it is! Manure contains necessary plant nutrients such as nitrogen, phosphorus and potassium, in addition to a variety of micro-nutrients and organic matter. However, in the wrong place, at the wrong time, or in the wrong concentrations, these “ingredients” can be pollutants.

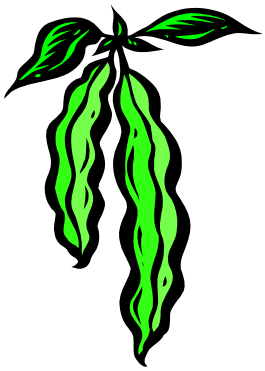
A collection of small and medium sized acreages with livestock in a watershed can have significant impact on water quality. When viewed as a whole, stocking rates may far exceed that of large commercial livestock operations. Though smaller and non-commercial herds and flocks are not often covered by specific rules and regulations, Montana and Federal law broadly states that no one can pollute waters of the state or nation. In addition CSKT has passed several ordinances to insure protection of the water resources on the **Flathead Reservation**. In the spirit of the law and being a good neighbor, here are some basic recommendations to protect water and conserve soil:

- Do not allow livestock to have direct contact with surface water and environmentally sensitive areas like wetlands. Instead, water from troughs or tubs on higher ground; fence out these areas leaving appropriate buffers.
- Scatter manure in small pastures for better distribution of nutrients and organic matter, and to expose possible pathogens or parasites to sunlight.
- Collect manure from pens, paddocks and stalls. Redistribute to pastures, crop land, gardens or export from property. Composting could be considered to reduce volume.
- Minimize manure run-off and soil erosion from pastures, pens, paddocks and corrals.
- Do not store manure piles or compost in flood plains, near wells or over very shallow ground water. Store on higher ground, preferably on soil with clay content.
- Create a conservation plan that addresses stocking rates, pasture management, manure management, land application of manure and fertilizers, and protection of water resources and riparian areas.

Proper manure and feed bunk management can also reduce odors, maintaining quality of life for the land owner and neighbors. Dispose of spoiled and spilled feed, and as previously recommended, store collected manure on higher

dry ground. Keeping barns, corrals and paddocks clean will also help reduce nuisances like flies and parasites. For more information on this topic feel free to contact the **Flathead Reservation Extension Office** at 275-2756, 675-2700 x7378 or **MSU Livestock Environment Associate Specialist Tommy Bass** at 994-5733 for more information.

## Food Preservation



**An important word about home canning of vegetables**

People still canning green beans at home using the boiling water canner instead of a tested pressure canning process are risking food loss and even worse, possible death or serious poisoning. The National Home Food Preservation Center is receiving inquiries from people canning dozens and dozens of jars of green beans in boiling water and then losing all that work and food due to spoilage. Beans canned this way looked fine coming out of the canner, but are now turning cloudy and jars are popping open, even sometimes with force. These beans are definitely spoiling from being underprocessed. But it could be worse: even if the jars still look good, it is possible that they contain botulism toxin from this unsafe canning practice.

Jars of improperly canned **vegetables and meats** (low acid food) can contain the deadly botulism toxin without showing signs of spoilage such as being seen in the reports mentioned above. Those that do show signs of spoilage could also contain botulism toxin because they are showing other signs of underprocessing.

Spores of *Clostridium botulinum* bacteria, as found naturally in soils, are very, very heat resistant. Even hours in the boiling water canner will not kill them if they are inside your jars of beans. Left alive after canning, they will eventually germinate into actively growing bacterial cells that will produce a deadly human toxin when consumed. The bacteria like the conditions inside closed jars of low-acid foods (such as vegetables and meats) sitting at room temperature, so they must be killed during the canning process for safe storage.

*Please be safe when canning foods for you and your family!* Knowledge and recommendations change over time with scientific developments. You should use up-to-date recommendations and methods and not just rely on practices of past generations. Get your up-to-date resources at the Flathead Reservation Extension office:

- USDA Complete Guide to Home Canning ($15.00) – This resource is also free on-line at the http://www.uga.edu/nchfp/publications/publications_usda.html
- So Easy to Preserve ($15.00) – Great reference tool for beginning or advanced food preservation (jams/jellies, pickling, fermenting, drying, freezing, canning)
- Ball Blue Book ($7.00) – Great visual learning tool with a variety of great recipes
- Ball Complete Book of Home Preserving ($16.00) – Delicious and creative recipes for salsas, relishes, tomatoes, pickles, condiments, spreads and fabulous fruits

If you have **questions or are interested in taking a Food Preservation class** please call the Flathead Reservation Extension Office at 275-2756 or 675-2700 x7378. Rene will cover high and low acid foods, altitude adjustments, and when to use a hot water bath or pressure canner. Other classes include freezing, drying, pickling, and preserves (jams, jellies, marmalades, chutneys). Canning classes are both presentation and hands-on. These classes are beneficial for people who have canned food for years or are new to canning.

With the increase in gardening, has come an increase in canning … and in some cases new slang terms arise. Canning is not immune to slang of its own. You may have even heard the term *jarring*. Hmmm … I say let's get together and do a little *jarring and jawing*. See you in the kitchen.

## Gardening Tips

Around the valley gardeners struggled this spring getting cool season crops to grow with the abundance of spring moisture. Many gardeners replanted peas and beans, some gardeners simply waited to plant until after the spring rains, opting for a shorter growing season. Whether your garden was a little delayed this year or right on time, here are some tips for July.

### Fruits and Vegetables

- Continue to remove those flower stalks from rhubarb as they appear. Finish up your rhubarb harvest but leave some leaf stalks to replenish plants food supply for next year.
- Harvest the fruit of peppers, cucumbers, snap beans and summer squash before they ripen to prolong production. Once the plant produces a seed the plant believes it has finished its job for the season and will slow production.
- Harvest broccoli while the heads are tight. Once the broccoli begins to open it doesn't take long for the broccoli to bolt and develop seed.
- Harvest raspberries when they are ripe and pull easily.
- Harvest currants by pinching the entire cluster and then finish shelling the fruit in the kitchen.
- Remember to use gloves when harvesting gooseberries.

- Make sure to continue building hills around your potatoes to keep the sunlight from turning the edges of potatoes green. Green potatoes are poisonous and are sure to give you a bellyache if you eat them.
- Remember your first cucumber flowers set no fruit. Additionally, the first flowers on squash are generally male flowers and set no fruit.

### Flowers

- Remember to deadhead annuals and continue deadheading all summer long so your plant will continue producing those beautiful flowers.
- Don't worry about ants on peony buds. This is a sign of a healthy plant. Leave at least two stalks of peonies when cutting.
- You may transplant bearded iris after the blooms fade. Dig the clumps, clip the leaves to half their length, and transplant shallowly, with the tops of the rhizomes barely exposed above the soil.
- You may transplant poppies when the foliage has died down.

### Watering

- By mid July plants use about 2.5 inches of water per week on plants. As plants grow and produce more foliage they will be using more water and will begin wilting without an adequate supply.
- Water your trees and shrubs enough to keep the top 10 inches of soil moist at all times. Remember, when you water your trees water under the drip line of the tree away from the trunk to reach all of the little feeder roots.

- Many lawn grasses are cool season grasses and want to go dormant during the hot summer months. At this time it takes a lot more water to keep cool season grasses green. On average your lawn will need 1" of moisture per week, depending upon your soil. To measure the amount of water you sprinkle on your lawn simply place tuna fish cans around the lawn and when the can is full you have sprinkled approximately 1" of water. If you water 3x per week the can should be 1/3 full each time. This will help you establish a length of time to water.

### Miscellaneous

- Turn and water your compost pile frequently to prevent drying. A compost pile should be about as moist as a wrung-out sponge. Aerobic microbes in the compost pile will thank you by working a little harder for you with an adequate supply of moisture.
- To maintain a "medium-maintenance" lawn fertilize your lawn on Memorial Day, Labor Day, and Columbus Day. More fertilizer will encourage lawn growth, require more water, and some additional mowing.

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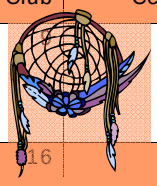
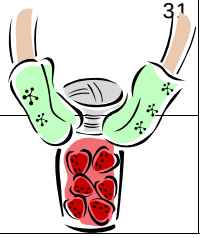
## Making a Difference on the Flathead Indian Reservation

MSU Extension is an equal opportunity/affirmative action provider of educational outreach.

**July 2010**

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|---|---|---|---|---|---|---|
| | | | | 1 Youth Gardening Boys & Girls Club | 2 Youth Gardening Boys & Girls Club | 3 ARLEE Celebration |
| 4 ARLEE Celebration | 5 HOLIDAY | 6 4H Congress, Bozeman, MT | 7 | 8 | | 10 |
| 11 | 12 | 13 | 14 Canning Class LDS Church St. Ignatius | 15 Youth Gardening Boys & Girls Club | 16 Elmo Standing Arrow Pow wow | 17 |
| 18 Elmo Standing Arrow Pow | 19 | 20 Lake County Bio Control Insect Collect | 21 | 22 | 23 | 24 |
| 25 | 26 Canning Class | 27 | 28 | 29 | 30 | 31 |
| Lake County Fair | | | | | | |





## MSU's Resource on the Flathead Reservation—6