



# Flathead Reservation Extension Newsletter

## More on Forage—A word from Rene

Some of you may be wondering if it's really necessary to get a forage analysis of feeds. A feed analysis is a valuable tool to help you develop a nutritional program for your livestock and a winter feeding strategy. According to Dennis Cash, John Paterson and Aimee Hafila (MSU Animal and Range Sciences), hay is the bulk package to deliver energy, protein, vitamins and minerals to livestock and they can be tested accurately and inexpensively. This year I am providing ten farmers/ranchers a great opportunity to have a forage test for no charge (see our July



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Newsletter). A mineral analysis will be included in the forage test. Trace mineral levels in forage are a function of soil content. If soils differ between fields sampling feed will help you understand forages cut between fields. Sampling will help you develop a baseline of feeds, determine if your livestock need supplements, and verify you are providing the correct supplements. Following is a

question and answer excerpt from **The Need for Copper and Zinc Supplementation in Montana** by John Paterson, MSU Extension Beef Specialist.

### Q: Why should I be concerned about trace minerals for my cow herd?

Supplementing minerals to beef cattle has been shown to have positive effects on reproduction, immune status, disease resistance and feed intake. Trace minerals are needed for vitamin synthesis, hormone production, enzyme activity, collagen formation, tissue synthesis, oxygen transport, energy production, and other physiological processes related to growth, reproduction and health. The requirement for trace minerals is often based upon the ability of the animal to maintain a desired level of performance. Table 1 shows the trace mineral requirements for growing and finishing cattle, and cows.

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#### INSERTS:

\* **Letter from IAC—Come Learn about our new Farm Bill!**

\* **Produce Safety — Food & Drug Administration**

**Table 1. Trace mineral requirements for beef cattle**

mg of mineral required per kg of dry matter consumed		
Mineral	Growing-Finishing Cattle	Cows
Cobalt	0.1	0.1
Copper	10	10
Iodine	0.5	0.5
Iron	50	50
Manganese	20	30
Selenium	0.1	0.1
Zinc	30	30

**Q: What are the symptoms of a copper or zinc deficiency?**

Table 2 summarizes the potential effects of a copper and/or zinc deficiency in both cows and bulls. The main effects of copper and zinc deficiencies are a reduction in reproductive efficiency; delayed estrus, decreased conception rates and increased dystocia. In my opinion, I also believe that much of the footrot I see in Montana is related to trace mineral deficiencies because zinc and iodine supplementation appears to cure the problem.

**Table 2. Symptoms of a copper or zinc deficiency in beef cattle**

Mineral	Cow	Bull
<b>Copper</b>	Delayed estrus	Decreased libido
	Embryonic death	Decreased spermatogenesis
	Decreased conception	
	Delayed puberty	
	Decreased ovulation	
<b>Zinc</b>	Immunity	
	Increased dystocia	Impaired growth
	Abnormal estrus	Delayed puberty
	Immunity	Decreased testicular size
		Decreased libido

**Q: Are there trace minerals that can reduce the utilization of copper and zinc?**

Yes, it has been shown that an excess of **sulfur**,

**molybdenum and iron** in the diet can interfere with the utilization of copper and may result in deficiency symptoms even though the levels of copper in the diet are adequate. This is one reason why nutritionists try to maintain a copper to molybdenum ratio of at least 4 to 1 when formulating diets or supplements.

The following table summarizes results of a survey conducted in Montana several years ago. This survey indicated that copper and zinc were deficient in most of the forages sampled (Table 3). Results with the grasses also indicated that there could be a secondary deficiency caused by a ratio of copper to molybdenum that was less than 4.

**Table 3. Mineral Concentration of grasses, forage-mixes and legumes for Montana**

Forage Type	No. Samples	Copper, mg/kg	Moly, mg/kg	Cu:Mo Ratio	Zinc, mg/kg
Grasses	151	5.2	1.45	3.6	18.2
Grass-legume	163	7.0	.81	8.6	19.2
Legumes	58	8.8	1.15	7.7	21.4
Requirement		10		More than 4	30

Low forage levels of copper coupled with the antagonistic effects of molybdenum requires careful supplementation if you are experiencing any of the symptoms described in Table 2.

The nitrate level was considered safe, but the sulfate level was at least eight times higher than recommended for cattle.



... Questions & Answers and Table 4 related to sulfur in water tests removed ...

**Q: What about sampling the liver to determine copper status?**

The liver is probably the best organ in the body to give an indication of the copper status of the beef animal. The following table shows results from a survey of eight states conducted a couple of years ago.

**Table 5. Percentage of cattle that were classified at deficient or adequate in liver copper**

State	No. Cattle	% of cows which were deficient, <30 ppm	% of cows which were adequate, >90 ppm
Colorado	329	30	30
Kansas	257	16	51
Missouri	32	6	63
Montana	182	0.2	61
Nebraska	78	55	12
North Dakota	113	92	0
South Dakota	162	65	27
Texas	60	10	62

What these results show is that in Montana, 61% of the cows sampled were considered to have an adequate amount of copper in the liver (>90 ppm) and less than 1% were considered to be severely deficient. The rest of the cows were between 30 and 90 ppm copper. One caution with these results, the cows sampled were from SW Montana and probably do not represent eastern Montana. Based on this survey, eastern Montana cows may have values more similar to western North Dakota and South Dakota. Cows from these two states appear to have a high percentage which would be considered deficient.



**Take home message:**

- Trace minerals can improve reproductive efficiency if cows are deficient.
- Many of the forages in Montana can be deficient in copper and zinc.
- Copper utilization is reduced with high levels of the antagonistic minerals molybdenum (in forage) and sulfate (in water).
- Liver biopsy results show that 62% of the cows sampled in Montana had adequate liver copper.

**Black Henbane—A Weed of Concern!**

Black henbane is an invasive plant. Although not on the noxious weed list, this plant has been reported as an invader in 42 counties in Montana.

Black henbane forms dense stands that replace other vegetation and decrease forage production and plant diversity.



Black henbane reproduces through seed (10,000 to 500,000 seeds per plant). Seeds germinate and develop a rosette in late May. The plant grows 1 to 3 feet tall. Leaves are large – up to 6 inches wide and 8 or more inches long. Foliage is covered with fine, sticky hairs. It flowers from June to September, with peak flowering usually in July. The 5-lobed, funnel-shaped flowers are brownish-yellow in appearance with dark purple veins (See photo). Plant size will increase when growing in moist soils with high nutrient levels.

**Methods of Control:**

Small-scale infestations may be controlled using hand removal or herbicide spot treatments. Larger infestations may require a combination of techniques.



- **Prevention.** The most effective method of black henbane management is preventing its spread and establishment. Property owners should prevent seed production of this plant from year to year. Seeds can remain viable in the soil for five years. Remove all weed seeds from your clothing, equipment, and vehicle before moving out of an infested area.
- **Grazing.** This plant is toxic and should not be grazed. Livestock will usually avoid it because of its foul odor and bitter taste, unless other forage is unavailable. Dried plant matter in baled forage retains its toxicity and will be readily consumed by livestock.
- **Cultivation** prior to seed production may be used to control black henbane. Cultivation must be repeated annually until the seed bank is depleted.
- **Pulling or digging** isolated plants or small infestations prior to seed production can be an

effective means of controlling this plant if the entire taproot is removed. If pulling, gloves and protective clothing are strongly recommended to prevent rash. Because of its thick, tough stem and roots, black henbane can be difficult to hand-pull. Pulling when the soil is moist increases the likelihood of removing the entire root. If initial pulling or digging does not kill the plant, the method must be repeated throughout the season to ensure no seeds are produced. Care should be taken with mature plants to avoid spreading seed, and the plants must be disposed of properly. Plants with mature fruits should be carefully placed and sealed in bags to prevent seed dispersal, disposed through the trash, and the area should be monitored for new seedling emergence for at least five years.



- **Burning:** Black henbane with mature fruits can be burned to kill seed and reduce seed spread. Remember to check burn regulations in your area.
- **Mowing:** Repeated mowing prior to seed production can be effective control.
- **Chemical:** Several herbicides are listed as providing control of black henbane. Read and follow the herbicide label to determine whether the herbicide applies to your situation, what rates are appropriate, and ensure all safety recommendations are followed. Herbicides recommended for black henbane control include dicamba, 2,4-D, glyphosate, picloram, and metsulfuron. Herbicides should be applied at the rosette stage and prior to flowering to prevent seed production. Dicamba or 2,4-D should be applied at 1 ounce /acre. Glyphosate is nonselective, but should provide effective control. Picloram (Tordon®), a restricted use herbicide, should be applied at 1-2 pints / acre with a non-ionic surfactant when there is adequate soil moisture and the plants are actively growing. Metsulfuron (Escort® or Cimarron®) applied at 0.5 to 1 ounce/acre plus a non-ionic surfactant is most effective at the late bolt to early flower stage. The area should be monitored after application and any escapes or regrowth should be retreated.
- **Biological Control.** There are no biological control insects or pathogens available.

This article was adapted from **Black Henbane: Identification, Biology and Integrated Management** by Monica Pokorny, Jane Mangold and Rene Kittle.

## Gardening Guide Tips

### Blossom End Rot

The blackened tissue on the flower end of the fruit (bottom), the result of blossom end rot, can develop at any stage of growth. It's not a disease but is caused by a lack of calcium in affected tissue.

In many parts of the country, the lack of calcium can be caused by a real deficiency in the soil. But Montana soils generally have plenty of calcium. A more likely cause is an induced deficiency caused by a



gardener. Excessive nitrogen fertilization, high soil salinity, and high levels of magnesium and potassium in the soil can be culprits, as can poor soil preparation and any garden chore that mutilates the roots, like deep cultivation to check weed growth. Extreme variation in soil moisture, such as letting the plants begin to wilt, then soaking them until the garden becomes a mud hole also contributes to the problem. So, what can you do to reduce this problem in your garden? Mulch your plants to keep soil evenly moist. Organic mulches work better than black plastic for controlling blossom end rot. Cage your tomatoes or let them sprawl on the ground; don't stake them and don't prune them too much.

### What is the right way to store vegetables?

Toby Day, MSU Extension Horticulturist

Store or preserve what you can't eat right away. Many vegetables and fruit can be stored in cellars, basements, barns and straw-lined pits. Temperature, humidity and ventilation are the keys to successful storage.

*Temperatures* in the storage area should be slightly above freezing to reduce the growth of decay organisms and to delay ripening. Humidity control is needed to keep fruit and vegetables from drying out or getting wet from moisture condensation. Add moisture to the storage by hanging wet burlap bags in the storage area, placing pans of water near the produce, or sprinkling the floor. *Ventilation* is required to provide oxygen and to prevent the accumulation of water on the vegetables which contributes to growth of molds and mildew. Ventilation will also allow a ripening gas produced naturally by the produce, called ethylene, to escape from the area.

Vegetables that require fairly high moisture can be placed in plastic bags, but the bags should not be sealed so tightly that water condenses with temperature changes. No matter how well you control temperatures and humidity, the produce must be sound going into storage. Do not try to store bruised, rotted, or otherwise damaged produce.

Homeowners who lack appropriate facilities can utilize temporary storage pits. Dig the pit to extend below the frost line, which might be up to seven feet in some areas. It should have a pipe or flue to provide ventilation when the vegetables are first stored. Cover vegetables in the pit with poles, a layer of woven wire or brush, a foot of straw and then six to eight inches of soil. Repeat this layering with additional produce until the pit is nearly full. The cover for the pit, made from plywood or boards, should extend beyond the pit's edges. The following crops can be stored under the conditions suggested:

**Cabbages and root crops, including turnips, carrots, rutabagas and parsnips--**High humidity at about 43F and some ventilation. Potatoes should cure 10-14 days at about 65F, then be cooled quickly and stored at about 43F. Well-cured onions, with tops removed, need good ventilation and 31-35F temperatures. To cure onions, let them dry and cut off the tops. Onions that "bleed" or that have thick necks won't keep well and should be used right away.

**Dry beans and peas--**Store at low temperatures in a well ventilated area.

**Pumpkins, winter squash and vegetable seeds --** A dry, well ventilated area at about 50F-60F for the vegetables and 40F-50F for the seeds.

**Tomatoes--**Pink and some light green will ripen within a few weeks if placed in shallow trays in an area that provides subdued light, moist air, and temperatures about 50F-55F. Entire plants can be hung in a dark, cool area. Tomatoes that have not begun the ripening process and that are still grassy green and hard, will not ripen in storage.

**Apples--**Long term storage requires temperatures barely above freezing. Store in perforated plastic bags or wrapped in paper. Early ripening "**summer**" apples, such as 'Gravenstein', 'Yellow Transparent', 'Lodi', and 'Red Astrachan', can only be kept a few weeks before breaking down. Late ripening "**winter**" apples, like 'R.I. Greening', 'N.W. Greening', 'Baldwin', and 'Golden Delicious' will keep several months in storage. In general, the later an apple cultivar ripens the longer it will keep.

## Food Preservation—Salsa Recipes

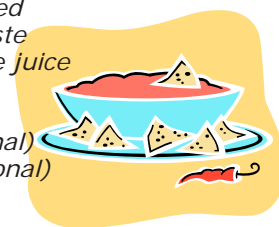
When canning salsa, remember to use a tested recipe. Salsas contain acid foods in combination with low acid foods. In order for salsa to be safe to can in a hot water bath the recipe must be acidic enough to reach a pH of 4. In , but not the amount. Remember to measure ingredients exactly. If you have a favorite salsa recipe that has not been tested, you may want to eat fresh or freeze. Here are a couple tested recipes for canning.

### TOMATO/TOMATO PASTE SALSA

3 qts peeled, cored, chopped slicing tomatoes  
3 cups chopped onions  
6 jalapeño peppers, seeded, finely chopped  
4 long green chile peppers, seeded, chopped  
4 cloves garlic, finely chopped  
2 12-ounce cans tomato paste  
2 cups bottled lemon or lime juice  
1 tbsp salt  
1 tbsp sugar  
1 tbsp ground cumin (optional)  
2 tbsp oregano leaves (optional)  
1 tsp black pepper

**Yield:** About 7 to 9 pints

**Procedure: Caution: Wear plastic or rubber gloves and do not touch your face while handling or cutting hot peppers. If you do not wear gloves, wash hands thoroughly with soap and water before touching your face or eyes.** Peel and prepare chile peppers. Wash tomatoes and dip in boiling water for 30-60 seconds or until skins split. Dip in cold water, slip off skins, and remove cores. Combine all ingredients in a large saucepan. Bring to a boil. Reduce heat and simmer for 30 minutes, stirring occasionally. Fill hot salsa into hot pint jars, leaving 1/2-inch headspace. Remove air bubbles and adjust headspace if needed. Wipe rims of jars with a dampened clean paper towel. Adjust lids and process in a boiling water bath for 20 Minutes.



### TOMATO SALSA (USING SLICING TOMATOES)

4 cups peeled, cored, chopped tomatoes  
2 cups seeded, chopped long green chiles  
1/2 cup seeded, chopped jalapeño peppers  
3/4 cup chopped onion  
4 cloves garlic, finely chopped  
2 cups vinegar (5%)  
1 tsp ground cumin (optional)  
1 tbsp oregano leaves (optional)  
1 tbsp fresh cilantro (optional)  
1-1/2 tsp salt

**Yield:** About 4 pints

Follow all instructions for above recipe except, simmer time is 20 minutes.





**INSIDE:**  
Don't miss IAC's  
invitation to a  
Farm Bill learning session!

## Making a Difference on the Flathead Reservation

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

August 2010						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2 Brushfires of Freedom Food Preservation	3	4	5 Boys and Girls Club Gardening Group AT THE FAIR	6	7
8	9 Brushfires of Freedom Food Preservation	10 Youth Education VBS Youth Education	11 Youth Education VBS Youth Education	12 Gardening Group Youth Education VBS Youth	13 Youth Education VBS Youth Education	14
15	16 Brushfires of Freedom Food Preservation	17	18	19 Boys and Girls Club Gardening Group	20	21
22	23 Brushfires of Freedom Food Preservation	24	25	26	27	28
29	30	31				
<p>Gearing up for back-to-school!</p> <p>Learn to preserve food safely, call the Flathead Reservation Extension Office. Remember, when canning low acid foods must be pressure canned for safety!</p>						