

Colorado Dairy News

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Drought and Forage

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Severe drought conditions throughout Colorado have raised questions about forage management. Good forage management will be critical to maximize returns in 2002. Corn is a versatile crop in drought conditions because it may be harvested for silage or grain. Harvesting corn for silage nearly doubles the amount of protein harvested per acre and produces 1.5 times more total digestible nutrients than if only the grain is harvested. On average corn utilizes 24 to 27 inches of water per acre during the growing season. Repeated moisture stress during the silk to tassel stage can result in grain yield losses as high as 50 percent. The four-week period surrounding silking, approximately July 20, is the most important time for irrigation. Depending on hybrid maturity, it takes between 50 and 60 days to reach black layer from 50% silk.

What is the yield potential of drought stressed corn silage? Corn silage yields may be 50 to 90% of normal under drought stressed conditions. Timing and duration of drought stress will determine yield loss. Silk emergence is the most critical time to avoid drought stress while early vegetative is the least critical period for drought stress. When irrigation water is limited, refrain from irrigating until the silking to blister stage of development, if possible. Drought stress during the blister to dough stage can cause yield losses between 20 and 40%. Hybrids vary greatly in their ability to handle drought. Side-by-side comparisons are a good way to determine yield differences between hybrids. If little or no grain is present, a general rule is that there will be one ton of 70% yield per foot of plant height.

Less water is required to raise corn silage than to grow a grain crop. Because corn silage is harvested 15 to 20 days before black layer or physiological maturity is reached, less water is needed to mature the crop to harvest. Depending on soil type and available water, harvesting corn for silage can reduce the number of irrigations needed by one to two irrigations.

What effect does drought have on silage quality? Drought can cause lower starch contents because there is less grain in the total silage mix. Energy will be partitioned

Table 1. Influence of moisture stress at various growth stages on corn grain yield.

<u>Stage of Development</u>	<u>% Yield Reduction</u>
Early Vegetative	5 - 10%
Tassel Emergence	10 - 25%
Silk / Pollen Shed	40 - 50%
Blister Kernel	30 - 40%
Dough	20 - 30

(Please continue on page 4, under Drought)

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Improving Heat Detection Efficiency in Dairy Cows

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A successful AI program is reliant on accurate heat detection. Unfortunately, heat detection efficiency is less than 50% in most large dairy herds. It has also been estimated that 5 to 30% of all artificial inseminations occur in cows that are not even in heat. Poor heat detection or misdiagnosis of heat results in lower pregnancy rates, increased days open, and longer calving intervals.

Various heat detection aids have been developed over the years to help dairy producers detect cows in heat. These aids include pedometers, chin-ball-markers, tail paint, Kamar patches and radio telemetric systems (Heat Watch). When used properly in combination with twice daily visual observations, these devices can significantly increase the number of cows detected in heat. However, when used incorrectly, these devices can result in inaccurate heat detection. Additionally, these aids can be very labor intensive or costly.

(Please continue on pg 3, under Heat)

Table of Contents

Commodity Pricing	2
BVDV	3
BVDV Eradication SOP Insert	

Important Dates:
Mark Your Calendar

August 23-25, 2002: Colorado State Fair, Junior and Open Dairy Show, Pueblo.

August 20, 2002: Milk Quality Seminar: Dr Hank Spencer, Wisconsin at Mad Russian Event Center, Milliken, Co, 6:30-9:30 pm. For more information contact William R. Wailes, CSU Dairy Specialist, 970/491-5390.

October 2-6, 2002: World Dairy Expo, Madison, Wisconsin.

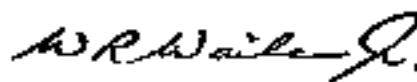
A Message From Your Extension Dairy Specialist.....

On top of the bad news of historically low prices for milk, Colorado dairy producers face the impact of the long hot summer on forage supply and prices. As addressed by Bill Curran in our lead article, there are strategies for handling drought stressed corn. More than ever it is also important to shop carefully for hay. It makes sense to look for sources as far away as Idaho where hay can still be found for \$125/ton.

Creative response to the current challenge of resulting feed prices can be found when one looks. I recommend two resources from the University of Wisconsin: The web page for the Center for Dairy Profitability <http://cdp.wisc.edu/> and the web page for the Wisconsin Team Forage <<http://www.uwex.edu/ces/crops/teamforage/>>. Although the Midwest is currently receiving lots of rain, just a few years ago they suffered a devastating drought and survived. We can learn from their experiences.

Dr Hank Spencer from Wisconsin will be in Milliken August 20th for a milk seminar. Although these summer days are busy, please join us.

Cooler weather unexpectedly graced the Larimer County Fair. The pattern will soon change. This is Colorado!



William R. Wailes, Colorado Extension Dairy Specialist



**Integrated
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Commodity Price Quotes

By-Product Feeds	Price/Ton Spot Loads	Price/Ton August-Sept
Bakery Waste	\$90.00	\$93.00
Blood Meal	\$370.00	NQ
Corn Gluten Feed	\$85.00	\$85.00
Corn Gluten Meal	\$275.00	\$275.00
Corn Hominy	\$88.00	\$88.00
Flaked Corn	\$110.00	\$110.00
Cottonseed Meal	\$185.00	\$185.00
Whole Cottonseed	\$170.00	\$170.00
Distillers Grains	\$102.00	\$102.00
Pork - Meat & Bone Meal	\$210.00	NQ
Tallow	\$0.15/lb.	NQ
SBM - 48%	\$215.00	\$218.00
Wheat Middlings	\$75.00	\$75.00
Soybean Hulls;Meal/Pellets	\$75.00	\$75.00
Canola Meal	\$155.00	\$155.00

These price quotes are delivery at Greeley, Co

Bovine Viral Diarrhea Virus Control and Eradication

*Robert J. Callan, DVM, PhD, DACVIM
Colorado State University*

BVDV is estimated to cost an average dairy between \$20 and \$160 per adult cow per year. These losses include medication and labor to treat acute infections, milk production losses in lactating cows, infertility due to decreased conception and early embryonic death, abortions, loss of weak, abnormal, or persistently infected calves. Large scale herd outbreaks such as occurred in the early 1990s are much more devastating and resulted in estimated losses as high as \$1000 per adult cow. The wide variation is due to differences in husbandry practices and vaccine use.

Vaccination Benefits and Limitations

While BVDV vaccinations have been available for many years, we are still no closer to eliminating BVDV than we were 20 years ago because vaccination alone is not sufficient to eliminate BVDV from an infected dairy herd. Current modified live and killed BVDV vaccines are generally effective at preventing the majority of overt clinical disease associated with acute infections, but these vaccines do not fully protect against fetal infection. Recently, some vaccines, more often the modified live BVDV vaccines, have demonstrated the ability to help protect the fetus from infection. This protection ranges between 50% to 80% in controlled studies.

Diagnostic Testing and Eradication Strategies

Comparison of the estimated costs of BVDV (\$20 to \$160 per adult per year) and current testing and eradication strategies (estimated \$5 to \$10 per adult including labor, supplies, and testing) suggest that BVDV eradication programs are economically justified in dairies. The development of a simple, inexpensive test that utilizes a sample that can be easily and conveniently obtained by dairy personnel is the breakthrough that has made eradication programs possible. As always, you should consult with your herd veterinarian in developing and implementing any disease control and eradication program.

Confirming the presence of BVDV in a herd is the first step in developing a BVDV control and eradication program. Suspicion is based on the observation of typical clinical signs including animals with non-specific fevers, decreased fertility, increased abortions (>3% per year), calves with birth defects, and small, stillborn, or weak calves. Periodic serological screening of unvaccinated calves greater than 4 months of age is an effective method of confirming the presence of BVDV. Blood samples from 5 calves in a group of weaned calves should be submitted for both type 1 and type 2 BVDV serology (\$5 per sample). Titers greater than 1:512 are consistent with recent infection in the calves and suggest the presence of a persistently infected calf in the commingled group. Similar testing can be performed on adult cattle however it is more difficult to interpret due to vaccine-induced titers.

The gold standard diagnostic test is virus isolation from blood samples. Unfortunately this test requires the ability to collect blood samples and is relatively expensive (\$20 per sample). It is best used to confirm acute infection. Other tests have been developed to identify persistently infected cattle including the microtiter ELISA, antigen capture ELISA, skin immunohistochemistry (ear notch test) and PCR assays. Each test has its advantages and disadvantages. Refer to the insert for further explanation.

(Please continue page 4, under BVDV)

(Heat, continue from page 1)

Studies conducted in the late 1950's showed that there are changes in rectal temperature during the cow's heat cycle due to hormones produced by the ovary. At the onset of heat the rectal temperature sharply increases. Thus, monitoring changes in body temperature may be a simple way to increase the efficiency of detecting heat in dairy cows if an easy method for recording daily body temperature was found.

Indeed, Phase IV Engineering developed a semi-permanent ID bolus that resides in the cow's reticulum. This bolus records changes in reticular temperature. At Colorado State University, we conducted a preliminary study to determine if this reticular bolus could accurately measure changes in internal body temperature that coincided with the onset of heat. Reticular boluses were administered to four cows. These cows were then given Lutalyse to induce heat and observed for signs of visual heat twice daily with the aid of an intact bull for a minimum of 30 minutes. Immediately following each visual heat check, rectal and reticular temperatures were recorded. Both reticular and rectal temperature decreased prior to heat. This decrease was followed by a sharp increase at the time of heat, and then a decline over the next 48 hours after heat. We believe that reticular temperature can accurately measure internal body temperature and that changes in reticular temperature may be a useful indicator of the onset of heat.

How does this system work? Cows with a bolus in their reticulum walk through a portal as they enter the milking parlor. As the cow walks through the portal, the cow ID and temperature are recorded.

Can this tool eliminate the need to watch cows for heat? No. Cows would still need to be visually observed for heat. The change in reticular temperature is only a cue that an individual cow should be watched more closely.

Besides aiding in reproductive manage-

(Please cont. on page 4, under Heat)

(Drought, continued from page 1)

more into fiber instead of grain. Important analytical measurements are: total dry matter, neutral detergent fiber digestibility, sugar, starch and non-fiber carbohydrates. Have corn silage tested. **Do not rely solely on standard NIR** (near infrared) tests when the crop is altered due to unusual environmental conditions. Use a wet chemistry analysis. Studies conducted by Michigan State University indicate that severely stressed corn, which had essentially no ears and was short, still had a feeding value of approximately 70% of normal corn silage. Under these circumstances, the value of corn silage may be based on nutrient density values.

When should corn silage be harvested? If the corn has any grain, use the milk line in the kernel to determine the proper time to chop. In general, when the milk line is one-third of the way down the kernel, it is ready for the bunker. When the milk line is two-thirds to three-fourths of the way down to the kernel tip, whole plant moisture is 63 to 68%. Whole plant moisture is 50 to 60% as the black layer begins to appear at the tip of the kernel. Green, barren stalks may contain 75 to 90% moisture. It is important to sample fields and conduct dry matter tests because the tendency is to harvest drought stressed corn too early and ensile too wet. Hybrid maturity, drought tolerance, and late season plant health may influence harvest timing significantly. If conditions remain hot and dry, silage harvest may occur earlier than normal. Harvest assessment will be required on a field-by-field basis. Be prepared to make harvesting adjustments with custom harvesters.

Will insects affect harvest time? The principle insect of concern is the spider mite. Spider mite activity is greater under hot and dry conditions and their influence will be greatest on stressed corn. If infestation levels are severe enough, early harvest may be warranted. Pesticides used to treat spider mite infestations have the following harvest intervals: Comite, 30 days after application; Dimethoate, 14 days after application; Capture, 30 days after application.

Should I be concerned with nitrates? High nitrate levels are likely in drought stressed forages. To avoid nitrate toxicity, test forages before feeding. Nitrates are in the highest concentration in the lower portion of the stalk. Increasing the cutting height is a simple method to address a high nitrate issue. In addition, ensiling the forage reduces the amount of nitrates by half.

How will drought affect alfalfa quality? When cut at similar stages of maturity, drought stressed alfalfa tends to be higher in crude protein and digestible dry matter (especially acid detergent fiber) due to lower fiber levels. Alfalfa goes dormant under severe water stress and requires several inches of moisture to green up.

Sorghum sudangrass has become a popular hay crop in 2002 because of the drought. Sudangrass requires certain management strategies to avoid problems with prussic acid. Any stress that retards normal growth may increase prussic acid risk. Young leaves contain the highest levels of prussic acid. Drought stunted plants or frozen leaf tissues present the greatest risk. Consider these management strategies to avoid prussic acid poisoning:

- ** Do not graze or greenchop until plants are 20 – 24 inches in height.
- ** If stunted by drought or other conditions, do not graze or greenchop until plants are 20 – 24 inches in height.
- ** Do not pasture following a closely cut hay or greenchop harvest.
- ** Avoid pasturing immediately following frost or freeze that does not completely kill plants; wait until top growth turns completely brown.
- ** Do not greenchop for two or more day after a killing freeze.
- **Prussic acid is not eliminated by ensiling .

(Heat , continued from page 3)

ment, the device can also be used to monitor herd health. Changes in body temperature may also indicate systemic illness prior to the onset of more obvious signs such as decreased feed intake or milk production, or abnormal milk. Early detection of health problems result in earlier treatment and resolution.



(BVDV, continue from page 3)

If the presence of BVDV is confirmed, a BVDV eradication program should be investigated based on economic considerations. Eradication of BVDV is economically advantageous if the cost of testing, eradication, continued surveillance and control is less than the cost of the disease. The focus of eradication strategies is to identify and eliminate persistently infected animals and thus remove the source of BVDV in a herd.

Two general strategies may be employed to identify persistently infected cattle and eliminate BVDV from a herd. The first strategy employs the testing of all cattle on the premises at one time. Alternatively, only calves at birth are tested and the cost of the program is spread over the entire calving interval.

Once a herd is free of BVDV, precautions must be established so that the herd is not reinfected. A comprehensive vaccination program should be maintained, as reintroduction of BVDV into an immunologically naive herd could be devastating. The purchase of a persistently infected animal or a negative animal already carrying a persistently infected fetus due to exposure at the herd of origin is the most likely way to reinfect a herd. Springing heifers from heifer rearing facilities are particularly at risk of carrying a persistently infected fetus. All new introductions into a herd, including their offspring and any bulls, must be tested as described above. Since the standard tests used to pick up persistently infected animals do not always detect acute infections, incoming animals must be quarantined for 3 weeks prior to introduction into the common herd.