BEEF Q&A

BEEF QUESTIONS AND ANSWERS

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INSIDE:

MONTANA STATE UNIVERSITY EXTENSION

Survey Shows Majority of Producers Approve Beef Checkoff

by Charlene Schuster, Montana Beef Council

Approval of the beef checkoff program remains high, at 70 percent, according to a winter (Dec.18, 2006-Jan. 11, 2007) survey of 1,225 beef and dairy producers, commissioned by the Cattlemen's Beef Promotion and Research Board.

The Beef Board conducts surveys twice a year to gauge producers' economic moods and their expectations of checkoff investments, as well as checkoff program familiarity, strengths or weaknesses. The survey, conducted by Aspen Media & Market Research, is funded with checkoff monies.

Over the past five years, producer approval rates for the checkoff have remained steady, ranging from 70 percent to 73 percent. The proportion of producers who disapprove of the program has remained virtually the same in the past year, although disapproval ratings are trending down. Since January 2003, the producer disapproval rate has dropped 12 points—from 27 percent to the current 15 percent.

The top three checkoff –funded activities that producers described as "essential" to the beef industry were: continuing to foster consumer confidence in the safety of beef (62 percent); advertising beef to consumers (57 percent); and promoting U.S. beef in other countries (51 percent).

The survey also regularly asks producers their opinions on the short-term direction of cattle prices. In the winter survey, opinions were about 50-50 that prices would remain the same. However, the winter survey found only 21 percent of producers felt pessimistic about prices, compared to 31 percent who felt that way during the June 2006 survey. Eighteen percent expected higher prices, compared to 11 percent who felt that way in the June 2006.

** The statistical margin of error for a sample of 1,225 respondents is + (-) 2.8 percentage points.*

Beef: Questions & Answers *is a joint project between MSU Extension and the Montana Beef Council. This column informs producers about current consumer education, promotion and research projects funded through the $1 per head checkoff. For more information, contact the Montana Beef Council at (406) 656-3336 or at www.montanabeefcouncil.org*

Understanding Grass Growth:
How It Can Help You Harvest Pastures More Efficiently

By Dr. Tracy Brewer, AssistantResearch Professor of Range Science, Joe Skeen Institute for Rangeland Restoration, Dept. of Animal and Range Sciences, Montana State University

The only thing a rangeland grass needs in order to grow is an adequate amount of rainfall that falls just when you need it, right? Wrong!

Successful grazing managers recognize that 1) after being grazed, grasses need an adequate amount of leaf and stem tissue intact to recover and regrow, and 2) grasses grow differently than forbs (the showy, pretty plants in your pastures), shrubs, and trees. Understanding these concepts can help you boost grass production, graze pastures more carefully and more efficiently, and maintain the presence of desirable forage species in your pastures.

Leave Leaves after Grazing

Photosynthesis is the process grasses use for tissue growth and maintenance. In the presence of sunlight, grass plants use chlorophyll (the green tissue in plants) to form glucose (sugar) by taking up water through their roots and carbon dioxide through pores in their leaves. A plant's photosynthetic efficiency is driven by the amount of green leaf and stem tissue present on a plant.

I'm sure you've heard the old adage "take half, leave half." This concept refers to the importance of allowing your livestock to graze only one-half of the above-ground leaf tissue that is present when you enter a pasture and leaving the other half intact. Leaving half of the leaf tissue will guarantee photosynthetic potential, promote plant regrowth, maintain long-term grass production, and sustain plant root growth and function.

How a Grass Plant Grows

All plants have an area where growth tissue resides, called the "growing point." The growing point is where growth is initiated on all plants and

Continued on page 12

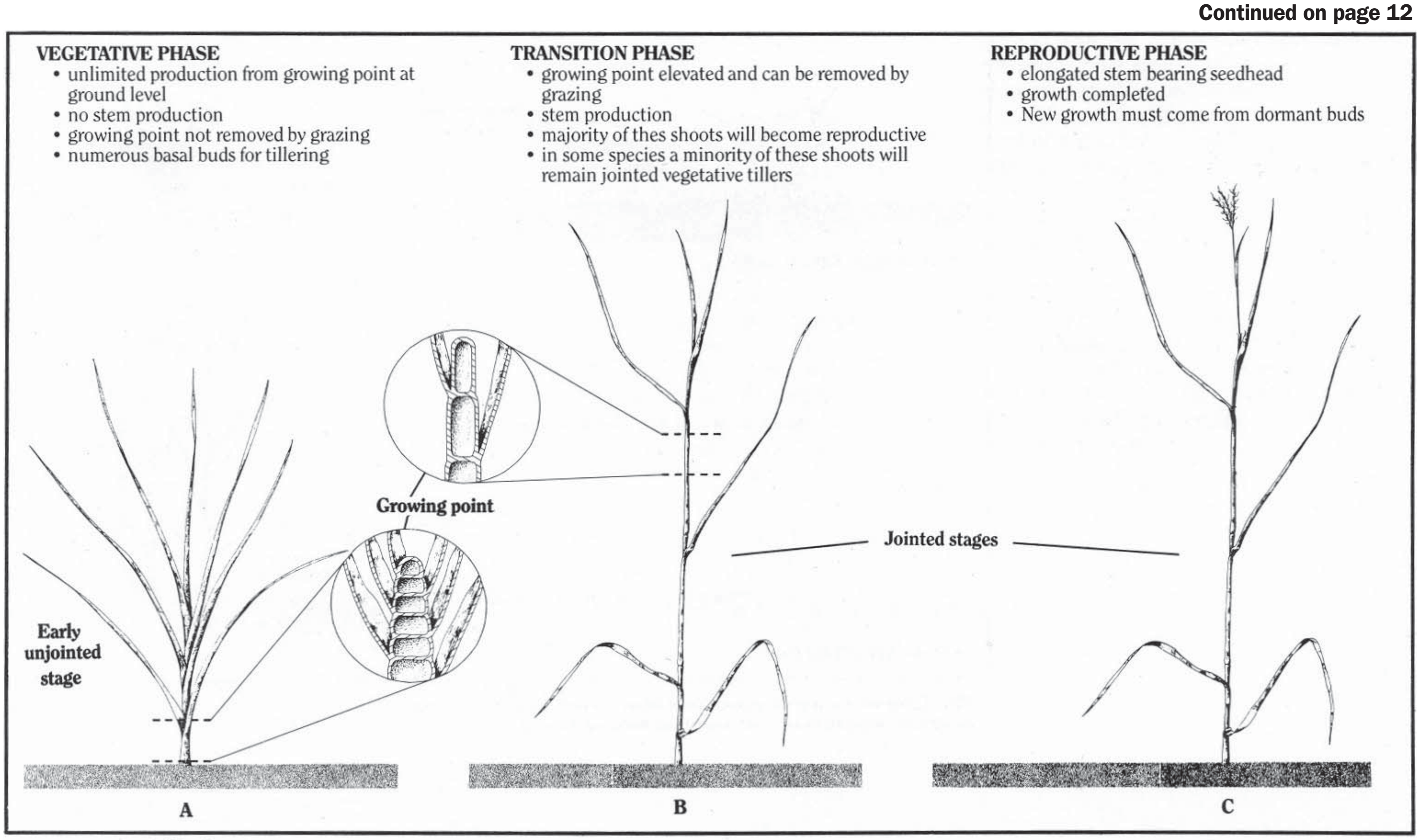

FIG. 6 Developmental phases of a grass tiller.

Biological Risk Management:

Managing disease by reducing introduction and spread

By Nico Cantalupo, County Agent from Fallon/Carter Counties

The Center for Food Security and Public Health at Iowa State University, funded by the USDA Risk Management Agency, designed an innovative approach to disease control called Biological Risk Management. BRM approaches disease management by evaluating and addressing the routes of disease entry and spread or transmission. This approach has the advantage of controlling several diseases at one time. By assessing disease risks and implementing management steps both common infectious diseases such as Bovine Viral Diarrhea (BVD) as well as new or unexpected ones can be minimized. With BRM, there is less need for detailed knowledge about individual diseases.

There are five primary routes of transmission for diseases entry or spread on a ranch: **aerosol**, **direct contact**, **fomite or traffic**, **oral** and **vector transmission**. **Aerosol transmission** occurs when disease agents contained in droplets pass through the air from one animal to another. Close proximity of infected and susceptible animals is typically required for disease transmission.

Direct contact transmission of disease agents occurs when a susceptible animal directly touches an infected animal or its open wounds, mucous membranes, blood, saliva, nose-to-nose contact, rubbing or biting. **Fomite transmission** occurs when a disease pathogen is carried or spread from one animal to another by an inanimate object (such as boots, buckets, milking and grooming equipment). Vehicles, trailers, and even humans can also be considered fomites and can spread disease through **traffic transmission**. Disease agents can also be spread through **oral transmission**, such as when an animal licks or chews on contaminated environmental objects or consumes contaminated feed or water. **Vector-borne transmission** involves the spread of disease through an insect. Ticks and mosquitoes are biological vectors; commonly spreading disease after becoming infected from a diseased animal and injecting the disease agent into another animal. Flies are a common mechanical vector; simply carrying the disease agent on their body and passing it from animal to animal.

Understanding how disease's transfer is a practical approach to minimizing disease outbreak and exposure. The beef industry in Montana topped a billion dollars in 2005, according to the National Agricultural Statistics Service, which is a significant part of our economy. With an increase in global travel and commerce as well as changes in food production practices, such as fewer facilities handling larger volumes, the concept of BRM will help us protect the herd in Montana. Biological Risk Management starts with understanding the importance of disease management, learning the routes of transmission, risk assessment of the ranch/facilities and finally making a plan that makes sense for your operation. Although the BRM will not totally eliminate animal disease, it will help minimize or decrease the spread or contact. You can find out more information by going online at www.cfsph.iastate.edu or by contacting Nico Cantalupo at the Montana State University, Fallon and Carter County Extension Office at 778-7110 or by emailing nicoc@montana.edu.

Should Horn Flies on Beef Cattle be Controlled?

By Greg Johnson, Professor of Veterinary Entomology, Montana State University

Horn flies are a common summer time pest on pasture and range beef cattle in Montana. More than a thousand flies may be present on an animal during July and August. These flies are blood-feeders and an individual fly will bite an animal up to 20 times a day. When horn flies are numerous, the number of bites per day per animal can be in the thousands. Cattle infested with large numbers of flies will bunch together and expend energy attempting to fight off or escape from the flies. Annoyance and irritation caused by these flies results in reduced milk production and lighter calves at weaning time. Studies around the US and Canada have shown improved weight gains when comparing treated to untreated animals. A Nebraska study demonstrated calf weaning weights of 10 pounds or higher when horn flies were controlled on cows. In a three-year Louisiana study, yearling replacement heifers treated for horn flies had a 17 percent weight gain over untreated heifers. A Canadian study demonstrated that production benefits (i.e., increased weight gains, milk production, better pasture utilization, feed efficiency) were maximized when fly-free grazing was maintained for 115 days. Research has indicated that as few as 200 flies per animal will result in reduced feed efficiency and lowered weight gains.

Horn fly biology

Horn flies are specific for cattle but in the absence of cattle will feed on other animals such as horses, goats and deer. Both male and female flies spend the majority of their time on the animal, moving from the backs and sides to belly during the heat of the day. Feeding and mating occurs on the animal. Females leave the animal to deposit eggs in fresh manure and then quickly return to the animal. A female will deposit up to 500 eggs during her lifetime. The flies show a preference for larger animals (bulls, cows, steers, heifers) and tend not to bother calves until the end of the summer when calves have grown.

Horn fly larvae, which are typical-looking fly maggots, hatch from the eggs deposited in the manure. Egg to adult requires 10 to 14 days with rapid buildup of flies occurring by mid-summer. As daily temperatures decline in the fall, the horn fly goes into diapause and overwinters in the pupal stage—a growth stage between the larva and adult. Adult flies emerge from the diapausing pupae in the spring and the cycle begins again.

Horn fly control strategies

Because of their economic importance and associated losses in weight and feed performance, horn flies should be controlled on beef cattle. Because flies spend the majority of their time on an animal, self-treatment control devices are effective in controlling horn flies. Self-treatment devices include backrubbers, dust bags and insecticide ear tags. Another approach for horn fly control is treating the manure where horn fly larvae develop. This can be accomplished by giving cattle a feed additive (mineral containing insecticide) or an insecticide bolus.

It should be noted that reports evaluating duration of control for certain products or devices is often variable. Studies have demonstrated control with a certain product for a few weeks while another study using the same product will show much longer control. One reason this variation occurs is that many studies are conducted by placing treated animals some distance from untreated animals thus eliminating fly immigration into treated herds. The duration of control cannot be determined if treated animals are not being challenged by migrating flies from untreated animals.

The information regarding insecticide products in this article is for educational purposes only. Reference to trade name is made with the understanding that no discrimination is intended and no product endorsement is implied by MAES or CES. In all cases, read and follow instructions on the pesticide label before making any pesticide applications.

Self-treatment control devices

Dustbags

Dust bags contain insecticide dust that filters through the bottom of the bag when cattle contact or pass under it. Best horn fly control is achieved when cattle are forced to pass under the bags on their way to get water, feed or mineral. This is accomplished by fencing the water tank and suspending a dust bag in the entrance and exit gates. Forced-use of dust bags is often not practical with range cattle because they may obtain water from a large stock pond or stream rather than a watering tank. In this case dust bags can be placed at locations where cattle loaf during the day to be used free-choice. Generally, two dust bags in a loafing area are sufficient for treating approximately 50–60 cattle. In some cases older cattle and bulls will dominate a dust bag so only a few animals are treated. Bags should be inspected regularly and recharged with insecticide dust when necessary. Forced-use dust bags provide up to 90 percent horn fly control; fly control is 25–50 percent less using free-choice dust bags.

Backrubbers and oilers

Backrubbers or oilers consist of a chain wrapped in burlap and the burlap is treated with an insecticide diluted with No. 2 diesel fuel or commercial backrubber oil. Because of skin irritation, motor oil should not be used. When an animal rubs against the burlap, insecticide is wiped onto the animal. Like dust bags, backrubbers and oilers work best in a forced-use situation.

Insecticide ear tags

Insecticide ear tags contain one or more insecticides embedded in a plastic matrix. Movement of the tag while the animal is grazing or grooming releases insecticide over a period of time (weeks) and it travels through the hair coat of the animal. Generally, ear tags are effective against insects such as horn flies that spend a large part of their life on the animal and are less effective or ineffective against insect pest that are on the animal for a short period of time (e.g., horse fly, mosquito, stable fly).

When ear tags were first introduced in the late 1970's they were very effective against horn flies, providing season long control. However, this success was short-lived. Within a few years, horn flies developed resistance to pyrethroid insecticides used in the tags and many producers stopped using them choosing to go back to dust bags, oilers or feed additives or do nothing at all.

In response to the resistance problem, animal health companies developed ear tags using new chemistry in the form of pyrethroids, organophosphates, a combination of pyrethroid and organophosphate and an organochlorine. As a result there are many different types of tags on the market with different insecticides. A convenient way of categorizing ear tags is by the type of insecticide they contain.

Ear tags containing synthetic pyrethroid insecticides.

Insecticide	Brand Name
Permethrin	Atroban, Apollo, Ectiban, Ectrin, Ear Force, Expar Extra, Gard Star Plus, New Z Permethrin, Permectrin
Cyfluthrin	Cutter Gold
Beta-cyfluthrin	CyLence Ultra
Zeta-cypermethrin	Python, ZetaGard
Zeta-cypermethrin + synergist	Python Magnum
Lamba-cyhalothrin	Saber Extra, Excalibur

Ear tags containing organophosphate insecticides.

Insecticide	Brand Name
Ethion	Commando
Coumaphos + diazinon	Co-Ral Plus
Fenthion	Cutter Blue
Pirimphos methyl	Dominator, Rotator, Tomahawk
Diazinon (20%)	Optimizer, Bova Gard, X-Terminator
Diazinon (40%)	Patriot, Cutter
Diazinon + chlorpyrifos	Warrior

Continued on page 10

Implants in suckling heifer calves intended for cow herd replacements

By John Paterson, Extension Beef Specialist

I received a question from a producer who wanted to implant replacement suckling heifer calves. My initial thought was one of caution, but this news release by Glen Selk from Oklahoma State suggests otherwise (kind of). After I sent this article out to my list serve producers, Dr. Tom Geary sent me the message which is at the end of Dr. Selks news release. I think you will enjoy both articles. —JP

Growth implants have not been widely used in heifer calves because of concern by herd managers about detrimental effects on subsequent reproductive performance of heifers kept as herd replacements. Currently three implants Synovex-C®, Component E-C® (estradiol and progesterone), and Ralgro® (zeranol) have been given FDA approval for use on potential replacement heifer calves. Past reviews of this subject have been quite thorough and generally concluded that one implant given at or after the heifer is 2 months of age has very little impact on future reproductive performance (Hargrove, 1994 and Deutscher, 1994). Also these reviews have both concluded that implanted heifers have significantly greater pelvic area when measured at about one year of age, but these differences are indeed very small at the time the heifer is delivering her first calf at or about two years of age. Consequently, the data on dystocia rate indicates that implanted heifers have no less calving difficulty than do non-implanted counterparts.

The possible effect of implanting on breeding season pregnancy rates is still the major concern of ranchers deciding to implant heifer calves or leave them unimplanted. The following are tables reporting trials that examined the difference in pregnancy percentages of heifer calves implanted once at birth, once at calf-working time (approximately 2 months of age), once at weaning time, or multiple implants. Both the 36 mg zeranol implants and the 10 mg estradiol - 100 mg progesterone type implants are examined. The available data is clear that implanting at birth is detrimental to breeding season pregnancy rates.

Table 1. *Summary of trials where heifer calves were implanted with Zeranol at birth.*

Number of trials	Average difference from non-implanted controls in pregnancy rates
3	-39% (Range -37% to -50%)

Therefore, producers must be encouraged to follow label instructions closely when implanting heifer calves after 30 days or 45 days of age depending on implant type. The average loss in percentage pregnant due to one implant (at calf-working time) is quite small (tables 2 and 3).

Table 2. *Summary of trials where heifer calves were implanted once with Zeranol at 1 to 3 months of age.*

Number of trials	Average difference from non-implanted controls in pregnancy rates
13	-0.8% (Range -11% to +19%)

Table 2. *Summary of pregnancy rate of heifers implanted once at 1 to 3 months with Estradiol and Progesterone.*

Number of trials	Average difference from non-implanted controls in pregnancy rates
13	-3.8% (Range -10% to +6%)

The tremendous variation in the trials is partly due to the relatively small numbers of heifers represented in some treatment groups. This summary of trials should not lead to any conclusions that one implant type is safer than another when given properly at 2 months of age. When heifers are implanted once at weaning time, the risk of reduced pregnancy rates is slightly greater. Most producers can identify potential replacements at this time. Therefore, the decision to implant stocker heifers being kept for gain and not implanting those kept for replacements seems obvious for most operations. The summary of trials in which heifers were implanted more than once indicate that the risk of reproductive loss increases as the number of multiple implants increase.

Summary

The information available for suckling steer calves and heifer calves not intended for replacements is clear that growth promoting implants are consistent in improving average daily gain from implanting to weaning. Other reviewers have stated that the decision to implant is much more important than the decision of which implant to use (Corah and Blanding, 1992). Average daily gain responses of approximately .1 pound per day can be expected with the zeranol and estradiol-progesterone implants in steer calves. Slightly greater responses may occur in heifer calves (.12 to .14 pound per day advantages). This agrees with other findings in which heifer calves tended to produce greater responses than steers (Mader, et al. 1994).

Potential replacement heifers that can be identified early in life (for example heifers in seedstock herds) should not be implanted. No advantage in puberty age or dystocia rate exist. Heifers that cannot be identified early in the suckling phase as a potential replacement can be implanted once at approximately 2 months of age with very little risk of reproductive impairment. Re-implanting of replacement heifers increases the risk of reduced pregnancy rates. Economic analyses of a simulated commercial cow herd indicates that little economic risk exists if all heifers are implanted once at calf working time. The risk increased if a very high replacement heifer rate was used and ranch history of greater than 5 percent reduction in pregnancy rates due to implanting had been shown.

Response from Dr. Geary:

Hi John,

I'm not sure if you wanted a response to this email, but I disagree with the conclusion that implanting is safe as long as heifers are 2 months of age. The reason is that most of the early studies did not measure the estimated date of conception, and thus, calving date. They also did not include whether or not heifers that were diagnosed pregnant maintained that pregnancy. There is considerable evidence from Tom Spencer's Lab at Texas A&M that steroid implants (especially progesterone) during early neonatal life affects endometrial development in ewe lambs. In fact, they have developed a model (uterine gland knockout model) with this treatment that, depending on the length of progesterone exposure, results in different levels of uterine gland development. There is only preliminary information that this occurs in cattle (Skip Bartol at Auburn University did some work in this area years ago), but it is sufficient for me to conclude that even if they conceive, we know little about their ability to maintain the pregnancy or whether they conceive later and are thus less likely to breed back as 2 year olds.

My 2 cents worth.

Have a great day,
Tom Geary · USDA ARS, Miles City, Mont.

At left, state veterinarian Jeanne Rankin is inserting a micro chip into a horses neck as part of a research project at MSU. The chip has a 15 digit number which is used for identification and a temperature component which measures the animal's body temperature to determine if it is potentially sick. At right, the scanner is used to collect the animal's number and body temperature.

BQA & Animal Health

By Clint Peck, Director, Beef Quality Assurance, Montana State University

Beef Quality Assurance guidelines suggest producers implement herd health programs that address the prevention and treatment of disease – in that order. These programs vary depending on the type of operation and diseases prevalent in a particular region of the U.S. Cattle producers are encouraged to consult their veterinarian and establish effective herd health programs.

BQA practices continually emphasize a "three-pronged" approach to animal health that can minimize treatment, increase productivity and improve the growth environment for animals. These three prongs are:

1) **Vaccination programs** Follow some basic vaccine-handling precautions to ensure effectiveness of the vaccine:
   - READ THE LABEL!
   - Purchase fresh vaccines and store them properly in a refrigerator that's in good working condition. The refrigerator temperature should be monitored year-round for minimum/maximum temperatures.
   - Modified-live vaccine begins to lose effectiveness after about an hour—so don't mix too much vaccine at one time. Because direct sunlight also degrades the products, keep vaccines and syringes in a cooler when working cattle.
   - Don't use the same syringe to inject modified-live and killed products. A trace of killed product can harm modified-live product effectiveness.

2) **Biosecurity practices** The goal of biosecurity is to prevent, minimize or control cross-contamination of body fluids (feces, urine, saliva, etc) between animals, animals to feed and animals. Three basic routes to achieving a biosecurity plan will minimize the transmission of disease agents between herds and among herds: A) Isolation, B) Traffic control and, C) Sanitation.

3) **Screening systems** The animal health industry continues to deploy innovative technologies that focus on prevention through the early detection of health issues. Systematic screening for suspected disease agents should be incorporated a part of animal health management and biosecurity risk-assessment.

COMMON BIOSECURITY RISK FACTORS

Each infectious agent has specific characteristics, such as transmission route, chronic carrier frequency, environmental survival duration and infection detection ease. Each must be taken into account to successfully control or prevent disease infection and transmission.

Specific herds have different risk factors. These risk factors include housing and density for different groups during the production cycle, different purchasing and quarantine policies, different exposure to non-herd cattle, different nutritional status, and different environments.

Risk Factor #1: Carriers of subclinical infection. For most infectious diseases, the single largest risk factor for acquiring infection is the purchase of "subclinically" (silent) infected animals that are carrying the infectious agent. With respect to bringing in animals, clearly the most dangerous time is bringing in new animals around the time of calving that will expose newborn calves.

The most dangerous animal to bring in under these circumstances is the young saleyard calf brought in to "graft" onto nursing cows. Such calves are often colostrums-deprived and are very susceptible to diseases from the herd of origin or encountered during the marketing process. Carriers of subclinical infection are the reason for the old but true saying that "Most disease is bought and paid for!" and are what keep it in a herd.

The other potentially dangerous exposure is purchased colostrum or raw milk. Colostrum only fights disease in the calf's body and both may be contaminated with infectious agents, either because the source cow was shedding these agents or because her udder skin was contaminated with these agents from the environment.

Risk Factor #2: Animals deficient in critical nutrients. Such animals are more susceptible to infectious disease and cannot respond fully to vaccination because the immune system function is compromised.

A major mistake in many animal health/biosecurity programs is to focus on a single component, such as a vaccination program, as is often done. A vaccination program alone is not a herd-health program.

Vaccines differ widely in their efficacy, even when used properly. Few vaccines are highly efficacious, many are marginally efficacious under the best of circumstances and some of the older ones may even be detrimental.

Almost no sound cost-benefit field studies have been done for many vaccines. Depending on the type of vaccine, different errors in their use, both in administration and timing of administration, markedly reduce their efficacy. Due to these errors, some studies have found that up to two-thirds of some vaccines are used ineffectively (JAVMA 209:1618, 1996). Further, if through management errors the disease challenge is large enough or the stress high enough, it will overwhelm the protection afforded by any vaccination.

It is very important to note that while vaccination can increase the resistance of the susceptible animal, other factors under management control are often considerably more important. For example, if an animal is deficient in critical nutrients such as protein, energy, copper, selenium, vitamin A or vitamin E, it is both more susceptible to infectious disease and cannot respond fully to vaccination because the immune system function is compromised.

This is not to suggest that these nutrients should be supplied in excess (some are toxic in excess). Instead, if a nutrient deficiency problem is suspected, a veterinarian can sample carefully selected animals for appropriate testing and professional nutritionists consulted with the results.

Successful herd health programs require the careful integration of disease biology –knowledge of which is held by the veterinarian, with production cycle management on the specific premises, knowledge of which is held by the producer. For example, the vaccine recommendations made by experts nation-wide almost universally contain the same list of agents and administration timing guidelines. Yet for what may be good reasons a large portion of cow-calf herds do not follow these recommendations.

Risk Factor #3: Attacking a disease problem at a single point. Continued success in disease control is far more likely if anticipated disease problems are blocked at multiple points.

If a disease problem is attacked at a single control point, loss of control at that point ensures failure. On the other hand, if a problem is being attacked at multiple points, the degree of control at any single point does not have to be as stringent—and the complete loss of control at a single point does not ensure failure.

In the current vernacular, this is applying HACCP to herd health. Figure out what the critical control points (the "weak links") are for the wrecks that you don't want. Because cattle exist in a complex relationship with infectious agents and the environment of both, most infectious diseases in groups provide opportunities for these multiple control points.

For example, the time required between the first prospect for an animal to become infected and when they begin shedding the agent can provide opportunities for disease control. In the midst of an infectious disease outbreak, a common error is to focus infection control strategies only on the clinically affected animals, not recognizing that subclinically infected animals are also shedding the agent.

For example, in the midst of a scours outbreak all the calves in the group in which the outbreak occurred should be regarded as potentially infected and shedding. A common error is to remove the healthy appearing calves from the affected group and then introducing newborn calves to this new group. The subclinically affected calves then transmit the scours agent to the newly introduced susceptible calves and the outbreak continues, contaminating more ground.

By their very nature, infectious agents have built-in mechanisms for evolving very rapidly to evade mammalian defense mechanisms and to

Continued on page 13

Should Horn Flies on Beef Cattle be Controlled? *continued from page 5*

Ear tags containing pyrethroid + organophosphate insecticides

Insecticide	Brand Name
Lmbda-cyhalothrin + pirimphos methyl	Double Barrel
Permethrin + chlorpyrifos + synergist	Ear Force Rangler
Permethrin + chlorpyrifos	Perma-Tect II

Ear tags containing organophosphate insecticides

Insecticide	Brand Name
Endosulfan	Avenger

Ear tags are an effective method for controlling horn flies when an ear tag is selected that flies are not resistant to. A comparison of tagged versus non-tagged cattle was made in 2006 at USDA Fort. Keogh Livestock and Range Research Laboratory at Miles City, Mont. using insecticide ear tags containing beta-cyfluthrin (CyLence Ultra). In this study, three groups of cows were tagged with 2 tags each and calves were not tagged; a fourth group did not get ear tags. Prior to tagging, each animal in the tagged group was treated with a synthetic pyrethroid pour-on to knockdown the flies. Horn fly control averaged 91 percent (range 70 – 99 percent) from June 22 – August 29 (Table 1). Fly populations were moderate to heavy during the trial, with fly numbers in the untagged group exceeding 1,000 flies per animal towards the end of the trial. The effectiveness of the tag began to diminish at week 9 (August 29) as the number of flies on the tagged animals averaged >300 per animal.

Table 1. *Horn fly control using beta-cyfluthrin insecticide ear tages at Fort Keogh, 2006.*

Horn Fly Counts		Average No. of Horn Flies Per Animal		
		Tagged	Not tagged	% Reduction
June 22	Pretreat	442	359	
June 29	1 week	10	372	97
July 7	2 week	5	579	99
July 21	4 week	7	225	97
July 26	5 week	3	128	98
Aug 2	6 week	33	212	85
Aug 10	7 week	7	391	98
Aug 22	8 week	138	>1,100	87
Aug 29	9 week	302	>1,000	70

Resistance Management

Because resistance to insecticide ear tags has been a problem, management strategies have been developed for producers choosing to use ear tags.

1. Delay applying the tags. It's best to tag the animals in June, if at all possible, rather than early May. The tags may only be effective for 8 weeks and horn fly numbers are highest in July and August. If horn fly numbers exceed 200 per animal when tags are applied, it is best to apply a synthetic pyrethroid pour-on for initial knockdown of the flies.
2. Remove ear tags in the fall. This will reduce delivery of low insecticide levels which enhance resistance.
3. Rotate insecticides. One year use tags impregnated with synthetic pyrethroids, and use an organophosphate or organochlorine tag the next year. Do not use the same brand of insecticide ear tag two years in a row.

Animal sprays and pour-ons

Insecticides can be sprayed onto cattle for horn fly control. Some sprays come in ready-to-use forms, while others require dilution with water. Residual sprays are applied at 1-2 qt/animal at 150 to 200 psi to gain complete coverage of animal and penetration to the skin. High pressure sprays can be used to treat cattle thoroughly and inexpensively on a per head basis. More handling is required because the animals must be confined in a corral so that they can be sprayed thoroughly. Several applications, two weeks apart, will likely be needed during the fly season.

Pour on insecticides are ready-to use formulations that are poured along the animal's top line in measured doses based on the animals body weight. Most function as contact insecticides. Typically, they provide fly reduction for 2–4 weeks, so they must be re-applied at intervals. The length of control will vary with weather and other factors so re-apply when fly numbers build back up to about 100 per side but no sooner than the label instructions allow.

Feed additives and boluses

Feed additives are insecticides that are incorporated into a mineral block and consumed by grazing cattle. The insecticide in feed additives is passed out with the manure and kills fly larvae that develop in the manure. A bolus containing an insect growth regulator is also available. The bolus, given using a standard balling gun, enters the cow's reticulum and slowly releases the insecticide which passes out with the manure. The fly larvae developing in the manure are killed when they come in contact with the insecticide. Feed additives and boluses contains an insect growth regulator (methoprene or diflubenzuron) which interferes with larvae developing in the manure. These products generally kill 80 percent to 90 percecnt of the developing fly larvae, but there may not be a corresponding reduction of flies on the animal if they are in close proximity to untreated cattle. An untreated herd may provide enough flies to keep fly populations above the economic threshold for both treated and untreated cattle. Supplementary control measures may then be necessary to deal

Understanding Grass Growth *continued from page 2*

where elongation occurs. Unlike forbs, shrubs, and trees that house their growing point at the tips of branches, grasses house their growing point at ground level, within the base of the plant, where it is protected from grazing for some time in the spring. Grass plants initiate growth in the spring from buds located in plant crowns that house the growing point. As a grass plant grows, it begins by producing new leaves that are pushed upward from the growing point. At this stage, the plant has the ability to produce an indefinite number of leaves under desirable environmental conditions. Figure 6A (Waller et al. 1985) shows the growing point located at the base of the grass plant during the vegetative stage. At this stage in the spring, when tillers are unelongated, grass plants can be grazed moderately without removing the growing point (Figure 7, Top; Waller et al. 1985). With leaf tissue remaining and the growing point still intact, the grass plant has the ability to efficiently regrow and recover from grazing using existing leaves.

In the next stage of development, the grass plant begins to elevate its tiller, producing a stem, and eventually producing a seedhead. Once tiller elevation occurs, the plant relinquishes its ability to produce new leaves and the growing point begins to rise (Figures 6B, 6C; Waller et al. 1985). At this stage, the growing point can be found by locating the highest node on the plant. The growing point will be located just above the highest node. If the elevated grow-

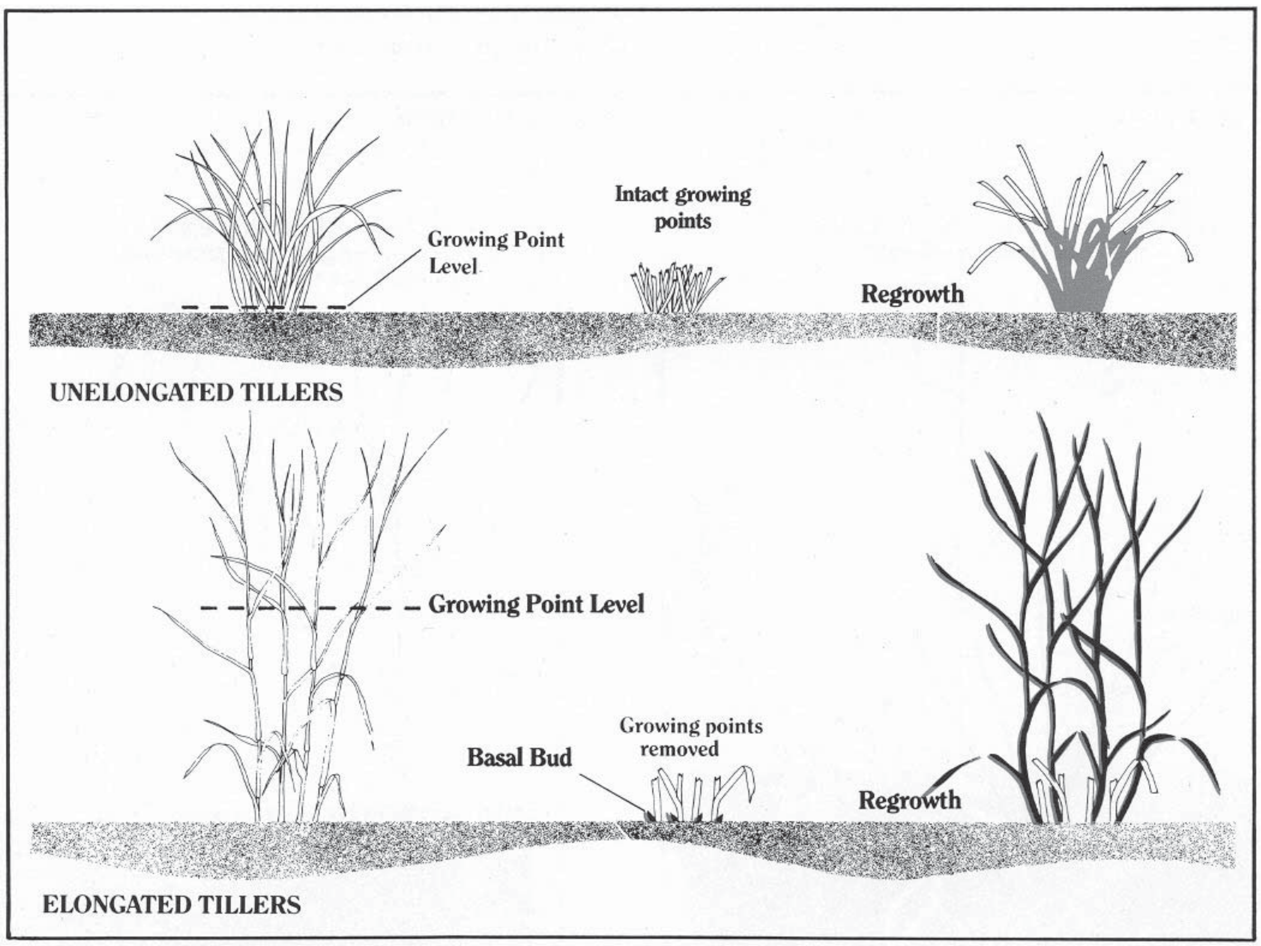

FIG. 7 Regrowth of a grass growing from intact growing points (e.g. Kentucky bluegrass) compared to regrowth from basal buds, e.g. switchgrass).

ing point is removed by grazing, the plant is forced to rely on new, dormant buds in the plant crown for additional growth during that growing season (Figure 7, Bottom; Waller et al. 1985), which requires the use of stored resources from the plant crown and roots and may cause undue stress on the plant if it occurs frequently.

Tying it All Together

Understanding how grass plants grow, where the growing point is located on the plant during various developmental stages, and realizing the importance of leaving leaf tissue intact when grazing actively growing plants can help you more efficiently harvest your rangeland pastures. For example, pastures that are grazed in the spring, where only half of the above-ground biomass is removed and the growing point is left intact, will regrow and produce additional forage that may be used later in the grazing season if adequate time elapses between grazing and the end of the growing season. Lastly, while getting an adequate amount of rain at just the right time is not the only thing rangeland grasses need to grow, it is a key component to capitalizing on the plant's growth process, residual leaf tissue following grazing, and stage of development during grazing to more successfully manage your rangeland grasses.

Waller, S.S., L.E. Moser, P.E. Reece. 1985. Understanding grass growth: The key to profitable livestock production. Kansas City, MO: Trabon Printing Co., Inc. 20 p.

BQA & Animal Health *continued from page 9*

take advantage of new opportunities inadvertently presented by man in his changing management of domestic livestock and their environment. These new strains sometimes require different control and preventive practices than the old strains.

Risk factor #4: Failing to implement systems to monitor and screen for diseases. Anticipate what diseases may be coming your way and systematically monitor your herd for anticipated disease agents.

It's important to note that new-age disease detection should go beyond simply diagnosing the presence of a disease agent in the face of animal death or under disease outbreak conditions. Innovations in diagnostic technologies continue to evolve, making whole herd screening for various disease agents more practical and affordable for livestock operators.

Anticipate what disease may affect your herd and determine well in advance what you can do to increase your herd's biosecurity against them. Then, implement changes in management that address the list of priority agents. Often, these are the changes you would have to make to control the infection were your herd to acquire it. Because this means changing human behavior, it is often hard to accomplish.

For example, the risk of transmission from mixing older with susceptible younger animals, particularly the practice of holding back slower growing but otherwise normal appearing animals must be recognized. And rather than continual mixing and sorting of groups, all-in, all-out group management, such as is used in the swine industry, reduces the potential for disease transmission from carriers to susceptible animals. Continual sorting and mixing also markedly increases stress as animals challenge each other to reestablish social dominance hierarchies.

Further, keeping track of animal health management, including animal movement is critical in this day and age. This requires a basic recording system and animal identification system that is consistently maintained year to year. The old adage "If you don't measure it, you can't manage it" applies here. The corollary "If you don't measure it, you likely aren't doing as well as you think you are" may hold even more truth.

Adapted from: Basic Concepts for Cow-Calf Herd Health Programs, John Gay, DVM PhD, Washington State University.

Drought Management Strategies: Take Action Early

By Rachel Endecott, MSU Extension Beef Cattle Specialist, Miles City, Mont.

As I'm writing this, much of the Northern Great Plains and Intermountain West is under a winter storm warning, hopefully starting off a spring filled with adequate moisture. If that is the case, this article may not be relevant for this year! However, warm winter temperatures to this point, coupled with below-average precipitation and snowpack may be cause for concern for many producers. Rod Heitschmidt, recently retired range scientist and research leader at the USDA-ARS Fort Keogh Livestock and Range Research Laboratory has observed that ranchers tend to be eternal optimists about precipitation even though drought is inherent in most rangeland environments. After all, "it might rain tomorrow!"

With that idea in mind, Heitschmidt, along with Fort Keogh range ecologist Lance Vermeire, have summarized 11 years of data from Fort Keogh (20th International Grasslands Congress, 2005) and found that an estimated 35 percent, 69 percent, and 91 percent of annual net primary production of perennial grasses occurred by May 1, June 1 and July 1, respectively. At the very least, two-thirds of annual perennial grass production would be completed by July 1 in 19 out of 20 years. Heitschmidet and Vermeire suggest that grazing managers can evaluate forage production in early July to estimate proper end-of-growing-season stocking rates with a relatively high level of confidence.

The researchers also evaluated long-term probabilities of receiving precipitation after July 1 (see http://www.hprcc.unl.edu/wrcc/sates/mt.html). For example, the probability of receiving 1 inch of rain in July and August in Miles City, Mont. is 59 percent and 42 percent, respectively. Furthermore, the probability of receiving 2 inches of rain in July and August is 22 percent and 17 percent, respectively. This website has many weather sites throughout Montana and other states in a range of environments.

If a forage shortage due to drought is expected, it is imperative to take action early. Some options to reduce forage demand include selling cows, leasing additional pasture, feeding additional energy to reduce grazing, or weaning calves early. Selective culling of the cow herd, particularly of less productive cows might be a good way to start decreasing forage demand. As drought progresses, supplemental feeds will increase in cost, thus leasing additional pasture might be an attractive option if it is available in the area. Supplementing cows daily with a high energy feed (i.e., ~5 lb grain) can cause a substitution effect where less forage will be consumed. Lactating cows experience dramatically increased nutrient requirements compared to dry cows. Early weaning not only decreases the forage intake of the cow, but also removes forage demand the calf had been placing on the pasture. A rule of thumb that may be useful is that for every day calves are early weaned compared to normal, ~0.6 grazing days worth of forage are saved (1300 lb cow, 600 lb calf when weaned at 7 months of age). In addition to the benefit of decreased forage demand, early weaning may have positive reproductive and cow body condition responses as well.

Assessing forage production and quality in the Northern Great Plains in early July could allow for drought decision making before it's too late to manage ecological and economic risk. In addition, more precise estimates of rainfall probabilities at your location may be made via the above-mentioned website to support your decision-making process.

Allflex Dual-Lane Multi-Panel panel reader system set up to read RFID ear tags at the speed of commerce. Photo by M. Miller

This research is designed to test 13 different ear tags and different scanners which might be set up in large feedlots or auction markets. The objectives were to determine if there was at least a 95 percent read rate of the electronic tags and if the calves would move through the chute at the speed of commerce; 1 yard/sec.

BEEF Q&A

BEEF QUESTIONS AND ANSWERS

MONTANA STATE UNIVERSITY EXTENSION

Participants at the 2007 Montana Livestock and Nutrition Forum listen to Dr. Gary Brester discuss the effects of opening the Canadian border to cattle greater than 30 months of age.

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MSU Extension
PO Box 172040
Bozeman, MT 59717-2040

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