



UNIVERSITY
OF WYOMING
EXTENSION | AG &
HORT



2018 beef cow herd outlook: expansion slows, prices hold

BY BRIDGER FEUZ

Three major factors affect the market dynamics of the beef industry: the supply of beef, the demand for beef and the status of beef trade. Looking at each of these factors provides a better understanding of long-term market trends.

Beef Supply

January 1 beef cow inventory in 2016 and 2017 saw back-to-back growth of 3 percent or more. The January 1, 2018, beef cow inventory number showed more moderate growth at only 1.6 percent.

Starting in 2006, the January 1 cow inventory declined year over year through 2013. The turnaround year was 2014, and 2015 saw moderate growth, with 2016 and 2017 experiencing significant growth. The January 1, 2018, beef cow inventory totals 31.7 million head of beef cows after the 1.6 percent increase.

The number of heifers held as beef cow replacements gives us an indication of the trend for January 1, 2019. The 6.1 million heifers retained

for replacements as of January 1, 2018, is still a historically high number, but it is actually a 3.7 percent decline from 2017. This is the first year since 2011 that fewer heifers were retained than the year prior.

Beef Demand

Beef demand is a combination of the amount of beef consumed in the U.S. and dollars spent on beef. These two factors are combined to form the demand index. The beef demand index, an index that adjusts for inflation and uses 1990 as the base year and 100 as the value, bottomed out in 1997 and again in 2010 at 75, a 33 percent decline from 1980 levels. Demand since 2010 has been stronger for beef and continued to grow through 2015, topping out at 92. The demand index for 2016 was 89. Consumers' willingness to stick with beef, even with relatively high retail prices over the last few years, has been a big driver for the demand index.

Beef Trade

The U.S. dollar began to strengthen in 2013, and the trend continued through much of 2016. As a

result, export markets were down slightly in 2014 and more significantly through 2016. The annual net value of exports – sales of exports minus cost of imports – was negative in 2015 but bounced back to \$880 million in 2016. When 2017 numbers are tallied, they will likely be similar to those of 2016.

Calf prices saw a slight rebound in 2017 from 2016 and trended up throughout the year. Prices in 2017 for 500- to 600-pound steer calves averaged \$155 per cwt. at the beginning of the year but trended upward. By October, prices averaged \$165. By the end of the year prices were at \$170.

What Will 2018 Look Like?

We still are faced with an increasing supply of cattle. The Livestock Marketing Information Center is projecting prices for 500- to 600-pound steer calves to be between \$157 and \$163 per cwt. in the third quarter of the year and \$149 to \$156 in the fourth quarter.

Bridger Feuz is the University of Wyoming Extension livestock marketing specialist. Contact him at 307-783-0570 or bmfeuz@uwyo.edu.

Hudson Hill's four keys to maximize backyard egg production

BY HUDSON HILL

Everywhere I go in Wyoming, I see more and more chickens. It seems more people than ever are experiencing the joys of having chickens and farm-fresh eggs. Here are four key concepts to consider when producing backyard eggs.

1. Nutrition is critical

Free-ranging chickens acquire most of the essential nutrients they need; however, as a guideline, provide growing chickens at least an 18 percent protein until maturity (between 16 and 18 weeks with most layers) then 16 percent protein once they start laying.

Calcium might even be as critical for layers, as a hen produces 150 percent of her body weight in eggs over an 18-month laying period. Adequate calcium is a must to make all those egg shells. Calcium can be provided two ways. Most bagged layer feeds include 4 percent calcium.

Alternatively, you can provide a free-choice option such as oyster shells. Remember that calcium is critical once a hen starts to lay, but you do not want to provide that calcium in the diet before she starts to produce eggs.

2. Housing chickens is pretty simple

Keep chickens dry and out of the wind, give them a place to lay their eggs, and provide protection from predators. It's easy to get on the internet and find advice about heating chicken coops and keeping chickens warm enough to lay eggs. In general, if you have

the right breeds and you're doing everything else right, chickens do not need additional heat.

3. To lay eggs, chickens need 14 hours of light

If you want your chickens to lay eggs in winter, you need to provide extra light. The best way is to install a light on a timer set to go off in the a.m., not the p.m. If the light turns off at night, the chickens are left in total darkness and do not roost as well. If the light turns off in the morning when the sun is up, the chickens go about their business. In December, for example, it gets dark by 5 p.m. and light by about 8 a.m., which is nine hours. Adding a light with a timer set to come on about 3 a.m. and turn off about 8 a.m. provides the flock with a full 14 hours of light.

4. Culling, the hardest management concept

Backyard producers must decide which comes first, the chicken or the eggs. After the first year, hens become less productive. After several years, they may be laying few eggs or none at all. Culling is removing those hens that are no longer laying eggs.

A hen lays eggs for about 18 months. After that, physiology

continues page 4



Agriculture and Horticulture Team here for you

BY BRIDGER FEUZ

This Barnyards & Backyards newspaper insert is produced by the University of Wyoming Extension Agriculture and Horticulture Team (Ag & Hort), which is charged with understanding and addressing the needs of farmers and ranchers and horticulture producers, landscapers, property owners, gardeners and enthusiasts throughout the state.

In general, agriculture is related to growing crops and raising animals for food, fiber and other products. Horticulture relates to the cultivation of vegetables, fruits, flowers, trees and shrubs.

We know Wyoming's extremes of climate and terrain present particular challenges.

That's why every day, extension educators and specialists show up at community centers, community colleges, homes, farms, ranches, gardens and schools to discover needs and present research-based approaches.

We partner with organizations, state agencies, counties and local conservation districts and weed and pest districts.

Our educators meet with Wyomingites in person and through remote conferences, online trainings, websites and blogs. We contribute articles to local newspapers and the Wyoming Livestock Roundup. We also produce the quarterly Barnyards & Backyards magazine, which is dedicated to rural living in Wyoming. (See page 5 for subscription information).

The stories in this Barnyards & Backyards insert include contact information. Every year, readers follow up by email, phone and in person at events and county offices. This year, we invite you to take advantage of the resources of University of Wyoming Extension, even if you've never done so before.

Besides agriculture and horticulture, UW Extension can help in range management, nutrition, food safety, community development, 4-H youth development and Master Gardeners. Educators and specialists serve every county and the Wind River Reservation.

To find your local extension office, go to bit.ly/countyoffices or visit the UW Extension website at bit.ly/WyoExtension. And while you're there, be sure to check out the calendar of events.



Bridger Feuz, chair
UW Extension Agriculture
and Horticulture Team
307-783-0570
or bmfeuz@uwyo.edu.

Use this tool to guide garden and landscape choices – but understand its limitations

BY CALEB CARTER AND HUDSON HILL

The USDA Plant Hardiness Zone map provides a good rough guide for gardeners choosing plants for landscaping and gardening. We have found a lot of misunderstanding, however, about what the zone map can and can't do.

As an example, much of Wyoming is in zone 4b. Plants in this zone should be able to withstand low temperatures of -20 to -25 degrees. Other parts of Wyoming are zone 5a, with average minimum temperatures between -15 and -20 degrees.

A hardiness zone is a geographically defined area in which a specific category of plant life is capable of growing, as defined by climatic conditions, including its ability to withstand the minimum temperature of the zone (USDA).

As anyone living in Wyoming knows, it can get much colder than the zone's minimum temperatures, even varying within specific zones. The hardiness zone map has other limitations as well. It does not consider duration of the cold temperatures or factors such as snow cover and soil moisture, which can help buffer cold temperatures. It also does not account for humidity and summer temperature extremes, the number of frost days or the effects of a catastrophic cold snap.

Summer Temperatures

In general, the weakness of the zone map for Wyoming gardeners is that it is based only on the average annual extreme minimum temperature without accounting for summer temperatures the plant might also endure.

For an extreme example, much of Arizona is the same zone as much of the Pacific Northwest. The difference between 90-, 100- and 110-degree

days can really make a difference in which plants might work best in a certain situation.

Combine that with soil moisture and humidity, and we see completely different plant types living in the same zone. You can be more successful when you understand what plants will work best with your winter – and summer – temperatures.

Cold Snaps, Snow Cover

The hardiness zone map doesn't take into account how many frost-free days your yard may experience or the variability within zones. Varying terrain and microclimates make Wyoming different from other parts of the U.S., where zone boundaries show more continuity. Understanding which plants can survive late spring or early fall frosts can be crucial to long-term, consistent success.

When picking trees and other perennials, we need to pick plants that can withstand large temperature swings. On November 10, 2014, much of Wyoming had what could be called a catastrophic cold snap. In less than 48 hours, many parts of the state went from temperatures in the 50s and 60s to below -20 degrees.

The 80-degree temperature shift was too much for many plants, and even plants that generally do

continues page 4

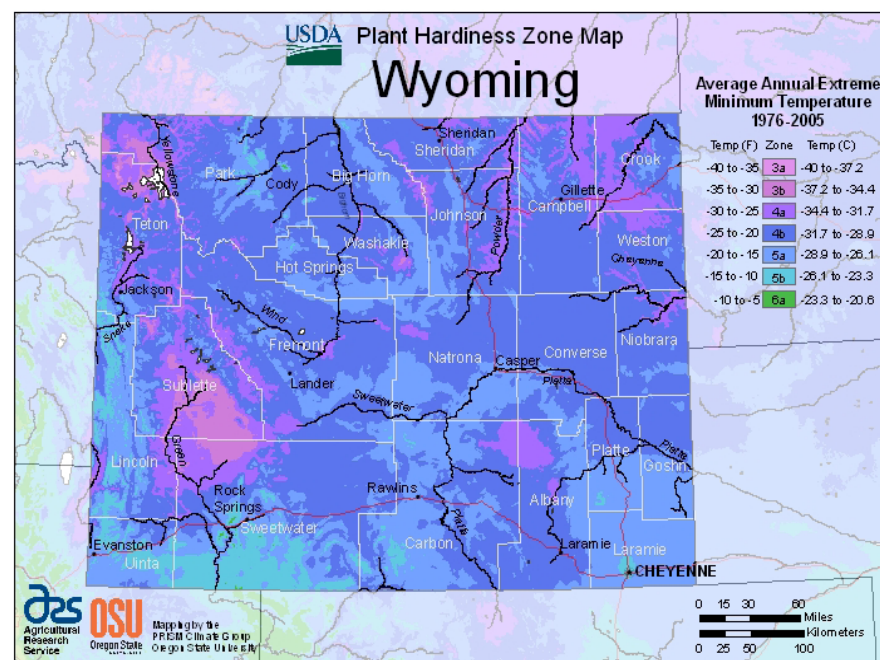


Image: U.S. Department of Agriculture

It's not too early to plan a garden

BY BRIAN SEBADE

A garden plan can be simple or complex, depending on what you want to grow. For most Wyoming gardeners, growing five to seven crops is an achievable goal. A well-thought-out plan increases your odds for a successful garden not only this year, but for future seasons as well.

Timing is Everything

When it comes to gardening in Wyoming's cold climate and short growing season, timing is everything. Knowing when you can expect the last frost of the spring and the first frost of the fall is critical. A table of frost probabilities based on calendar dates for your area is available from the "Wyoming Agricultural Statistics" (page 32) at bit.ly/WYagstatistics2015. The table was last updated by the USDA in 2015.

Once you've determined the length of your growing season, you can devise a plan for your garden. There are generally three options: 1. directly plant seeds into the ground to germinate and establish new

continues page 12

Farmers, ranchers benefit from promoting pollinators

BY SCOTT SCHELL

I want to make the case that all Wyoming farmers and ranchers can benefit by promoting pollinators. Creating, enhancing and protecting habitat that provides flowers during the growing season can promote pollinators, increase crop yields, reduce pest insect populations and add value to your land.

Pollinators Increase Yields

To ensure profitable yields, human-managed pollinators – usually honey bees and alfalfa leafcutter bees – are brought in to provide pollination services. Dry beans, though they have self-fertile flowers, show increased yield when wild pollinators, such as bumble bees, visit the flowers and “trip” them.

Livestock producers rely on the production of grass, a wind-pollinated “crop,” and may not think there would be any advantage to maintaining a diversity of flowering plants as part of their range management. Even grassland, however, can benefit from flowering plants in the plant community.

Pollinators Reduce Pests

Evidence for this can be seen in pure stands of crested or intermediate wheatgrass. These pastures can become heavily infested with black grass bugs, a native insect that sucks the cell contents out of grass leaves, stunting the plants and reducing the nutritional value of the forage. Black grass bug populations are rarely noticeable on native prairie where flowering plants help support populations of their many predators and parasitoids.

Many of the same plants that benefit pollinators also promote increased populations of beneficial insect species. These beneficial insects, the many predators or parasitoids of crop pest insects, can help control pests in crops that don’t need insect pollination. While the juvenile forms of many of these beneficial insects prey upon pests, their adult forms use nectar and pollen from flowers to survive and reproduce.

Examples of these insects are green and brown lacewings, many tachinid fly species and a multitude of parasitoid wasp species. Parasitoid wasps seek out pest insect adults, immatures and even their eggs, as places to lay their eggs. These eggs hatch and eventually kill the pest insect. The parasitoid wasps in the genus *Bathyplectes* attack alfalfa weevils and are an example of an important beneficial species that feeds on flower nectar as adults.

Pollinators Need a Hand

One way to promote pollinator populations, and wildlife in general, is to ensure they have healthy habitats that provide everything they need throughout their life cycles.

Pollinator conservation seed mixes are available to add flowering plants and boost pollination. I would recommend you check any wild mix you are considering with your county’s weed and pest district to make sure it doesn’t contain plant species that can become invasive in your region.

For enhancing pollinator and beneficial insect habitats on eligible land, the USDA Natural Resources Conservation Service (NRCS) provides technical assistance through its Conservation Stewardship Program program. This

Pollinators are the many animals, mostly insects, that visit flowers for rewards of nectar and pollen. As they move from flower to flower, they transfer pollen that creates fertile seeds for the next generation of plants.



Honey bee on native Kannah Creek sulfur buckwheat (*Eriogonum umbellatum*)

Photo: Jennifer Thompson

and the Environmental Quality Incentives Program also provide financial incentives to maintain pollinator enhancements.

The quickest way to find out if funding is available for enhancing your land is to contact your local field office. Use this link to find an NRCS office: bit.ly/nrcsfinder

Pollinators Add Value to Your Land

The decline of many kinds of pollinators in the United States and around the world has been well documented, and the problem has the potential to impact food production. Most people in the agricultural industry care about the long-term sustainability of agricultural production, especially those who want to pass on productive land to the next generation. To learn more about how to enhance pollinator habitats, check out the following resources.

Resources

- Issue of “Rangelands Journal” devoted to pollinators in rangelands: bit.ly/rangepollinators
- USDA Natural Resources Conservation Service (NRCS) website with pollinator information: bit.ly/nrespollinators
- Western SARE “Habitat Plantings and Restoration for Pollinators and Beneficial Insects” factsheet offers guidance and other resources for planning pollinator plantings: bit.ly/restore4pollinators
- UW Extension “Promoting Pollinators on Your Place, A Wyoming Guide” provides information on ornamental plant species, habitats favored by pollinators and an excellent section on getting started with beekeeping: bit.ly/yourplacepollinators
- Pollinator Guide resources from Barnyards & Backyards magazine: bit.ly/BBpollinatorguide

Scott Schell is an entomology (insect) specialist in the UW College of Agriculture and Natural Resources Department of Ecosystem Science and Management. Contact him at 307-766-2508 or sschell@uwyo.edu.

2018 Wyoming BEE COLLEGE
Saturday and Sunday
March 17–18
Laramie County Community College, Cheyenne
For more information, special hotel rates and registration, visit www.wyomingbeecollege.org.

gardening conference
april 14 & 15
register @ bit.ly/gardening 2018



Life as a tree is tough – here's how to help

BY BRIAN SEBADE

Frequent high winds, soils that are shallow and low in organic matter, low annual precipitation and a short growing season all challenge trees in Wyoming.

Like other plants, trees require food, water and adequate space to grow and reproduce. Trees in landscapes must weather a wide range of harsh climatic conditions. The challenge for many homeowners is making sure trees receive what they need to maintain adequate growth and health.

Water and Soil Management

Depending on the tree species growing on your property or landscape, they might be somewhat adapted to the climate or not at all. Some conifers species, for example, are planted in landscapes around the state that do not mimic their natural environment.

Spruces and firs are naturally found in habitats with damp or saturated soils throughout most of the year and generally have a layer of duff, or undecomposed forest litter, surrounding their base that keeps soils from drying out. Trees planted in landscapes that do not mimic their natural environments require extra resources and attention.

Making sure there is adequate water and nutrients for trees is crucial. Deciduous (the ones that lose their leaves) and coniferous (evergreen) trees both require adequate soil moisture during the spring, summer and fall.

While some trees are more drought tolerant than others, drought-tolerant trees still need adequate water for proper growth and maintenance. Trees that enjoy wet conditions, such as spruce and fir and deciduous trees such as fruit and nut trees, require consistent moisture throughout the growing season.

This means a good soaking every week to two with moderate watering in between. Turning the sprinkler on for five minutes a day is not enough to sustain adequate soil moisture. A general rule of thumb is ten gallons of water for every inch of trunk diameter. A sharp object, such as a screwdriver, can

help you gauge soil moisture levels by the ease with which it can be worked into the soil.

Adding two to three inches of mulch or wood chips around the base as far as the outside edge of tree branches (drip line) can help decrease soil water loss. To avoid the risk of rot, make sure the mulch doesn't touch the trunk. For soils that are low in organic matter and essential nutrients such as nitrogen and phosphorous, fertilization or incorporating compost and organic matter might be necessary. Refer to UW Bulletin-1172, "Fertilizing Trees and Shrubs" by Karen Panter, for more information. Find it at bit.ly/fertilizingtrees.

Winter and Environmental Management

Again, water is important. While above-ground growth shuts down in winter, roots are still active during portions of dormancy. Some root growth continues, and sap flows in the early spring prior to budding and leafing out.

It is a good idea to water evergreens in the middle of winter when there is little snow cover, soil temperatures are above 40 degrees and soil moisture is scarce. Trees such as spruces and firs have many shallow roots that can be easily damaged during warm winter periods.

Tree wraps, trunk covers and fencing can ensure trees are not harmed by human or wildlife activity. If you plan to prune, winter is a good time because trees have not budded or leafed out.

For more on getting trees ready for winter, pruning and watering, visit the tree and shrub care section of the Barnyards & Backyards website at bit.ly/barnbackyard.

Insects and Disease

Entire books are dedicated to insect and disease issues, but if you do not have the time to master insect and disease management, proper tree care is a great strategy for helping trees in your landscape fight off insect and disease damage.

Again, the most important strategy for defending against winter damage, environmental stress and disease and insect issues is making sure trees receive adequate water, nutrients and protection.

If you have further questions related to tree care in your area, contact your local UW Extension Office.

Brian Sebade is the UW Extension educator and Master Gardener coordinator based in Albany County and serving southeast Wyoming. Contact him at 307-721-2571 or bsebade@uwyo.edu.

continued from page 1



will try to force her through a molting period. During molting, a hen stops laying and loses her feathers. In nature, this usually happens when daylight hours shorten. She will start laying again in the spring.

Here are two strategies I see poultry owners use for culling laying hens.

Producers purchase chickens, keep them through one full cycle, then cull the entire flock and start again with new birds. This approach closely mimics mainstream egg production and is probably the most economical way to produce eggs.

Other producers keep chickens of different ages and breeds and decide on an individual basis how long the chickens stay. These producers let the chickens go through the molting process. When egg production drops too low for the number of chickens, the producer examines the vent and pin bones to determine which chickens are laying eggs, then decides which and how many to cull.

Hudson Hill is the UW Extension educator serving southwest Wyoming. Contact him at 307-885-3132 or hrcill@uwyo.edu.

continued from page 2

well struggled. That event left tens of thousands of trees across the state with brown needles. Many died.

If we pick trees that can't withstand temperature swings, they may be fine for several years then die or show other signs of stress, such as the tops or middles dying out. A good strategy is to pick a plant from a zone lower than for your location.

On the other hand, many parts of Wyoming have reliable snow cover for the coldest part of the year. This snow cover helps some plants survive in a lower (colder) USDA zone than otherwise might be expected.

Think Outside the Zone

When researching and selecting plants, regional or state sources (books, extension bulletins, catalogs) are a good place to start. Seek out local resources such as garden club members and Master Gardeners in your area. Extension educators from the UW Extension Agriculture and Horticulture Team are available to help.

Certainly, the hardiness zone map is a good tool for Wyoming landowners and gardeners. When we understand its limitations, we can use it more successfully. Happy gardening!

Caleb Carter is the UW Extension educator serving southeast Wyoming. His specialty is crop systems. Contact him at 307-532-2436 or ccarte13@uwyo.edu.

Hudson Hill is the UW Extension educator serving southwest Wyoming. Contact him at 307-885-3132 or hrcill@uwyo.edu.

WHEN IS A TREE A HAZARD?

BY DONNA HOFFMAN

To be a hazard tree or be removed, that is the question.

Many aging trees in our urban forests and windbreaks surrounding homesteads and pasture lands are dead or dying. Sometimes pruning will improve their condition. Knowing when to remove a tree that is declining or dead is harder.

Trees aren't designated a hazard unless they could fall on something or someone – a target. Of course, property is a concern, but having humans as targets increases the hazard level and risk of liability associated with not removing a tree. For example, a tree branch overhanging a neighbor's fence is of less concern than a branch overhanging a swing set or play area. A tree growing over a garage is a lower risk than one overhanging a bedroom.

Look for Hazard Tree Indicators

The trunk of any tree is its main support, and decay in the trunk can lead to failure, especially during high winds. Cracks in the bark or wood can invite disease organisms to infect exposed tissues. Fungal conks (mushrooms) are not as common in our drier environment, but they do occur and are a good indicator of deeper decay. When new wood grows around a cavity caused by decay, the tree can sometimes remain substantial enough to stay standing, but beware. Any of these indicators can cause a high-risk rating if there is a target below.

The canopy of a tree often receives the most inspection and is an important indicator of the tree's overall health. If plenty of leaves are supported by strong branches, photosynthesis might be enough to fight off disease organisms through the process of compartmentalization. If the leaf area of the crown is insufficient to sustain the crown, trunk and roots, the tree will decay, decline and eventually die. If sections of the tree have dead branches, pruning and investigation into the overall health of the tree are necessary.

Roots are somewhat harder to investigate but are another important indicator of the tree's overall health. Without a healthy root system, the crown and trunk have little chance of staying upright in Wyoming winds. Roots are often



Photo: Donna Hoffman

Indicators suggest this Wyoming cottonwood might be a hazard tree.

damaged by construction activities. They are also affected by soil compaction, soil mounding and drought, which can cause root dieback.

Once woody tissue in the ground dies, decay organisms go to work to return that organic matter back to the soil. In the meantime, dead roots are a detriment to the tree. Once bacteria or fungus begin to decay root tissue, less water and fewer nutrients are absorbed. Photosynthesis and growth decline, limiting the tree's ability to fight decay above ground.

Practice Good Tree Care

To keep trees in good health, provide plenty of water and nutrients in the surrounding soil, from the dripline and beyond.

Another component of good tree care is regularly scheduled pruning. Routinely pruned trees are less likely to develop defects and weaknesses that lead to decay and failure. Plus, early pruning leaves smaller wounds that are easier for the tree to close.

Winter months, or those when trees are without leaves, are a great time to hire an arborist certified by the International Society of Arboriculture (ISA) to prune, survey tree health and assess hazard potential.

If a target lies beneath or near a tree, consider hiring an insured certified arborist to remove limbs or the entire tree. Remember, there comes a time when whether to remove a hazard tree is no longer a question.

Resources

- Fertilizing trees and shrubs: bit.ly/fertilizingtrees
- Winter watering: bit.ly/Winterwater
- Tree owner's manual from the Wyoming State Forestry Community Forestry Program: bit.ly/WYtreeowner

Donna Hoffman is the UW Extension horticulturist in Natrona County. Contact her at 307-235-9400 or dhoffman@natronacounty-wy.gov.

Subscribe
BARNYARDS & BACKYARDS
Rural Living in Wyoming Magazine

www.uwyo.edu/barnbackyard



Join our email list and enter to win a one-year subscription to Barnyards & Backyards magazine by sending your name and email address to cespubs@uwyo.edu.

Risk Management for Wyoming Farms and Ranches

In a time of low commodity prices, low profit margins and little sign of change on the horizon, it is imperative to develop and implement a comprehensive plan to help manage your risk exposure.

Crop insurance is one mechanism to mitigate risk; numerous insurance options are available. Chances are one can meet your operation's risk management needs. Diversified farms and ranches can benefit from both the crop and livestock insurance options.

Crop Insurance

Most crop insurance policies in Wyoming fall into one of four categories: Revenue Protection (RP), Yield Protection (YP), Actual Production History (APH) or crop-specific.

RP policies provide an overall revenue guarantee that protects against falling prices and yields; indemnities are paid if actual revenue falls below the guarantee, whether due to a decline in harvest price or yield. Producers can also select a harvest price exclusion (HPE), which means the revenue guarantee is determined by the commodity price when the policy is written.

YP policies protect solely against declines in yield, with coverage of up to 80 percent (for most crops) of their APH yield.

Other APH-based policies are used for specific Wyoming crops, such as sugar beets and dry beans. These policies are similar to YP policies in that they utilize a producer's APH yield but with a percentage price election that varies by crop. Other crops, such as forage seeding, use a maximum dollar amount in place of an APH yield.

Check with your local crop insurance agent for policy availability in your area. A Catastrophic Coverage (CAT) option is available for most policies for a flat \$300 per producer. This option covers 50 percent of a producer's APH yield at 55 percent of the price. Depending on the crop, additional buy-up options for CAT may be available.

Forage Insurance

One of the most popular crop insurance policies in Wyoming is the Pasture, Rangeland and Forage Rainfall Index (RI-PRF) insurance. This policy insures against losses in forage and pasture productivity and is based on NOAA rainfall index data. This data is collected for a 17 by 17 mile grid area and is averaged across 2-month intervals (June-July for example).

Producers can select a productivity factor between 60 percent and 150 percent of the county base value and up to 90 percent coverage. More than one interval must be selected for coverage, with at least 30 percent and no more than 70 percent coverage in any one interval, and the intervals cannot be consecutive.

Indemnities are paid when the actual index value per acre, determined by the rainfall index, falls below the insured index value. It is important to note that actual rainfall received at any one location in a grid area may not coincide with the rainfall index; as a result, it is possible to experience below-average rainfall and not receive an indemnity payment at a given location.

RightRisk.org

RightRisk.org is a premier site for risk management information and online tools including the Risk Navigator toolbox, which helps producers better manage risk in their operation. Visit RightRisk.org to use tools, view producer profiles and learn more.

TOOLS AVAILABLE

- Risk Scenario Planner
- Enterprise Risk Analyzer
- RD Financial
- Machine Risk Calculator
- Risk Navigator Toolbox
- A Lasting Legacy

Forage insurance similar to an APH-based policy is available for producers of alfalfa and alfalfa-grass mixes for hay. The coverage available for this policy varies yearly, as the forage price is set each year. Stand populations must meet minimum requirements, and coverage is available from 50 to 75 percent of established yield at the determined price, based on the existing stand. Producers who are eligible for the Supplemental Coverage Option (SCO) can raise their coverage level to 86 percent, and buy-up under CAT coverage is available in most areas as well.

Livestock Policies

Wyoming livestock producers have two main insurance products to manage price risk: Livestock Risk Protection (LRP) and Livestock Gross Margin (LGM) insurance. LRP policies are available for feeder and fed cattle, lamb and swine. Producers select the coverage period ranging from 13 to 52 weeks and a coverage level between 70 and 100 percent of the projected price at the end of the contract.

Prices are determined by Chicago Mercantile Exchange (CME) indexes for the selected period; the price received on the open market (cash sale price) for the livestock is irrelevant to calculating any indemnity payment for the insured period. If the actual price index drops below the contract price by the end of the period, an indemnity is paid on the difference. The number of head and other limitations are specific to the type of livestock insured.

LGM insurance, available for beef, dairy and swine, is similar to LRP in that it protects against price declines. But LGM also insures against declines in revenue due to falling feeding margins, as well as declines in price.

LGM policies use a complex formula to determine actual revenue levels at the end of the insured period. Producers can sign up for LGM at the end of a given month for a predetermined number of head and specified time period.

Whole Farm Revenue Insurance

Whole Farm Revenue Protection (WFRP) was designed to provide insurance coverage for farms and ranches, covering losses of gross income for the farm rather than for a specific crop. This type of coverage could be especially beneficial for specialty crop and livestock producers (such as seedstock producers) and other farm operations that might prefer this type of approach to conventional strategies.

WFRP provides coverage for all commodities produced on the farm, except timber products, livestock for show or sport, and pets. The insured revenue (up to \$8.5 million) is determined from the farm's five-year production history and Internal Revenue Service Schedule-F tax returns. Indemnities are paid when actual gross revenue declines below the guarantee level.

Farms and ranches seeking the 80 to 85 percent coverage level are required to grow or raise at least three different commodities. To be counted as a commodity, production revenue must be at least 8.3 percent of the total farm revenue insured.

For More Information

Visit the USDA Risk Management Agency website at rma.usda.gov to learn more about crop insurance policies and risk management options. The site contains useful decision tools and calculators to assist in risk management planning.

James Sedman is a consultant to the UW College of Agriculture and Natural Resources Department of Agricultural and Applied Economics.

John Hewlett is a farm and ranch management specialist in the UW College of Agriculture and Natural Resources Department of Agricultural and Applied Economics and member of the regional RightRisk and Risk Navigator teams. Contact him at 307-766-2166 or hewlett@uwyo.edu.

Risk Management for Smaller Ag Operations

Unstable input and commodity prices, weather and pests are some of the risks faced by managers of agricultural businesses of all sizes.

Smaller operations may have less capital at stake and lower risk exposure than larger operators; however, smaller firms present their own unique set of risk-related challenges. Often, smaller businesses have even less room for error.

Strategic Risk Management Process (SRMP)

The SRMP Small Business Edition (SRMP-SBE) is tailored for smaller, non-commercial and lifestyle-type operations. The SRMP-SBE proposes three main phases for risk management: strategic, tactical and operational. The diagram is circular to suggest that risk management planning should be an ongoing process; conditions on the ground change, therefore the plan should adjust accordingly.

The SRMP-SBE material guides users through each step of the process, presented alongside an in-depth example developed for a specialty crop operation.

1. Determine Your Financial Health

The first step is to know the business' complete financial position. The concept is to identify any financial issues before they become too big to address down the road. This is done by constructing basic financial statements that can help monitor business liquidity, solvency, repayment capacity, profitability and financial efficiency.

2. Discover Risk Tolerance

Risk tolerance is that level of risk a person is willing accept in order to achieve a particular goal. Finding your risk tolerance helps set the tone for strategies to manage the risks facing your business.

The SRMP Small Business Edition walks users through a worksheet, guiding them to discover their personal risk tolerance.

<p>MISSION STATEMENT FOR WHITE'S VINEYARDS: To fulfill our lifelong dream of developing a profitable specialty crop business during my retirement, where we will produce the highest quality grapes in western Colorado.</p>			
<p>WHITE'S VINEYARDS STRATEGIC GOAL WORKSHEET</p>			
<p>Goal Statement: <i>Produce high-quality grapes that can be sold for wine making within five years. That is, drink wine from our own grapes within five years!</i></p>			
<p>Deadline for Goal Attainment: <i>Fall 2019</i></p>			
<p>----- Goal Costs/ Resources Required: -----</p>			
<p>Natural Resources + Own 6 acres of 3-year-old vineyards + Weather and soils conducive for grape growing (particularly for Riesling)</p>	<p>Human Resources (Available, rather than hours worked) + Husband- 20 hrs. + Wife- 40 hrs. + Adult children available for back-up help- 10 hrs. week</p>	<p>Financial Resources + Cash purchase of 6 acres of vineyards, using retirement savings (no mortgage!) + No debt and able to borrow for equipment</p>	<p>Capital Resources + Adequate senior water rights + Four-wheel drive pick-up truck</p>
<p>Associated Tactical Objectives:</p> <p><i>Tactical Objective 1-1: To beat the county average yield and price for wine grapes within 5 years.</i></p> <p><i>Tactical Objective 1-2: Within 5 years, establish supply contracts with two local wineries for wine grapes.</i></p> <p><i>Tactical Objective 1-3: Recover investment costs, except for land, after 5 years and position vineyards to be able to purchase 2-3 more acres for vineyards in year 6.</i></p>			
<p>Associated Operational Plans: (for Tactical Objective 1-3 only)</p> <p><i>Operational Plan 1-1.1: Consult with grape and wine experts to establish an annual growing and production schedule. Monitor progress quarterly and annually to meet targeted production schedule. Re-evaluate schedule each year.</i></p> <p><i>Operational Plan 1-1.2: Purchase used tractor trailer at the end of the year, if annual production goals are attained.</i></p> <p><i>Operational Plans 1-1.3 and 1-2.1: Develop a demand for the product by inviting select local wine producers to annual holiday season open house to view operation and sample the product.</i></p>			

Example of a strategic goal worksheet



The Strategic Risk Management Process

3. Risk Management Goals

Strategic goals, tactical objectives and operational plans provide a road map for guiding the business forward, particularly with regard to risk. The example worksheet offers a method for describing both the approach, as well as the resources, needed to achieve those goals.

4. Describe Sources of Risk

Agricultural risk is often grouped into five categories: production, price, financial, institutional and human resource risk. It is helpful to both identify and prioritize the sources of risk that are the greatest threat to the business. The SRMP-SBE approach helps describe the steps to address each significant area of risk.

5. Likelihood of Outcomes

Estimating how likely a risk outcome might be can help managers focus attention where it can have the greatest effect. For example, if you were certain a negative outcome would occur, you would probably avoid taking a risk. The SRMP-SBE supplies a method that draws from historical data or your own estimates to assess how likely future risks might be.

6 and 7. Identify and Rank Alternatives

The four basic strategies for risk management are avoid, transfer, assume and reduce. Each business manager has a different perspective on risk. As a result, some strategies are more appealing than others.

Identified strategies with the best chances of success should be compared on how well they move the business toward its goals, their demands for resources and how well they match your risk tolerance. Strategies that provide better results at a lower cost rank higher.

8, 9 and 10. Implement, Monitor/Adjust and Replan

The operational phase puts risk management plans into action. Implementation focuses on resource acquisition, flow and coordination. Along the way, the manager must monitor resource performance and make necessary mid-course adjustments.

In addition, re-planning challenges managers to consider possible changes in the overall business strategy. This may not be needed each year, but occasionally operators should reflect on how well business resources are performing, if progress toward goals is appropriate and even whether those goals are still correctly described.

The 10-step SRMP Small Business Edition helps users identify, plan for and manage risk. There is no right or wrong when it comes to risk strategies; rather, the goal is to help identify and understand what level of risk works best for you and your business.

The Strategic Risk Management Process Small Business Edition is available free at RightRisk.org. Under the Products tab, select Strategic Risk Management, then Small Business Edition near the bottom of the page.

Boost soil health for more productive pasture, hay or cropland

BY JAY NORTON

Practicing the 4 Rs of fertilizer management can enhance soil health and reduce fertilizer costs. When Right rate, Right placement, Right time and Right type of fertilizer are combined with proven conservation practices, crop biomass is increased and soil organic matter is conserved.

Healthy soils provide plentiful crops, forage and wildlife habitat, as well as lots of clean water. Decomposed plant, animal and microbial materials – soil organic matter – give soil its ability to store and supply both water and nutrients. Soil organic matter is key to soil health even though it usually makes up only 2 or 3 percent of the weight of the soil.

Fertilizers applied as part of sustainable management improve soil health by increasing plant biomass that contributes to soil organic matter. Fertilizers applied to replace good management – as a quick fix for depleted soil – cause a spiral of declining yields and need for greater amounts of fertilizer.

Soil microbes and plants take up nutrients as quickly as they are released from decomposing organic materials. Fertilizers provide exactly the same forms of nutrients as organic matter, but the influx of nutrients from fertilizers affects microbial activity, organic matter decomposition rates and nutrient cycling in ways that are often unfavorable.

Minimizing tillage, growing cover crops, applying compost and rotations that include periods of perennial hay or pasture, careful grazing management and other components of sustainable management conserve as much plant

material as possible on the soil surface. In such a system, fertilizers applied using the 4 Rs increase plant biomass production. More plant roots and aboveground residues contribute to soil biota and increased soil organic matter.

Fertilizer Management

The 4 Rs of fertilizer management are crucial to efficient and responsible use of fertilizer as part of a sustainable agricultural production system, whether in pasture, hay land or cropland.

The right rate means using soil test results to determine how much nutrient the soil can provide and how much more is required for optimal yield.

The right placement means appropriately injecting, banding, incorporating or watering in fertilizers to maximize access by roots and minimize loss.

The right time means applying nutrients as closely as possible to when plants need them.

And the right source means choosing the right form of dry or liquid fertilizer for the crop and environment.

Combining good fertilizer management with conservation cropping and grazing practices can eventually reduce or even eliminate the need for fertilizer as rising organic matter levels cycle nutrients, minimize losses and supply plants.

The Soil Degradation Spiral

Continuous annual cropping and heavy tillage cause degradation of soil structure and loss of organic matter, leading to losses of nutrients to erosion and accelerated decomposition.

The microbial community – now reduced and opportunistic – cannot assimilate the added nutrients, so nutrient availability is often out of sync with crop demands. Expensive fertilizers not taken up by plants or microbes are lost to



Mike Fabrizius of Mile High Ranch in Fremont County and extension educator Caitlin Youngquist examine how organic matter has increased over the years as a result of Fabrizius' soil management practices.

deep leaching or runoff or released as gases to the atmosphere.

Loss of soil organic matter causes cloddy, structure-less soil that supplies less water and fewer nutrients, impedes root growth and is vulnerable to compaction and erosion.

With time, practices that increase organic matter also decrease the amount of added fertilizer needed per unit of crop yield. On the other hand, as the nutrient and water-supplying potential of the soil increases, the potential yield also increases, so optimal fertilizer rates might stay the same or increase.

Jay Norton is a University of Wyoming Extension soils specialist and assistant professor in the College of Agriculture and Natural Resources Department of Ecosystem and Management. Contact him at 307-766-5082 or jnorton4@uwyo.edu.

For more information about managing fertilizers to enhance soil health, go to Norton's website at bit.ly/Nortonsoilmanagement and click on Soil Links.

Dr. Caitlin's garden recovery program

BY CAITLIN YOUNGQUIST

Using a rototiller is like putting your soil – and all the life it contains – through a blender.

Tilling with a rototiller destroys the structure (i.e. tilth) that allows air and water to move through the soil. Bare soil is hot and dry in summer, blows away in the wind and welcomes weeds. Soils high in clay can become “addicted” to tillage over time. This means they no longer have good structure and rely on tillage to be workable.

The soil is a complex living system of plants, animals, insects and microbes. Tilling disturbs the balance of this system and increases reliance on inputs such as fertilizers, fungicides and herbicides.

Protecting the surface of your soil and reducing disturbance (i.e. tillage) can greatly improve the health of your soil and garden over time.

Step One: Ditch the Rototiller

This spring, instead of rototilling your soil until it's smooth and barren, reach for a shovel. Gently turn the soil and look for the earthworms. These are nature's rototillers. When left undisturbed to do their job, they mix and fertilize the soil. They eat decomposing material on the surface and carry it down into the soil.

If starting the garden with transplants, dig a small hole where the plant will go, incorporate some compost or potting soil and set your

transplants in the ground. They do not need a smooth surface.

If starting with seeds, you may need to work the soil a bit more, using a shovel or trowel and your hands. Small seeds like lettuce and carrots will germinate better in finely textured soil that provides good seed-soil contact. They can be planted in a thin layer of potting soil on the surface. Large seeds like peas and beans are quite tough and can handle an uneven soil surface and thick mulch.

Worms and fungi are two of our greatest allies in the soil. Research in Wyoming has found a single gram of soil can contain hundreds of meters of fungal hyphae (filaments). In our arid, high-pH soils, mycorrhiza can greatly increase the ability of most plants to find

continues page 12

FUNGAL FRIENDS

Mycorrhiza (plural: mycorrhizae) is an association between fungi (myco) and plant roots (rhiza). There are seven kinds of mycorrhizae, and up to 90 percent of all plants on the planet benefit from mycorrhizal associations of some type.

As macrosymbionts, plants benefit because the fungal mycelium (hyphae or filaments) extend the reach of the roots, enhancing the plants' ability to access water and nutrients in the soil.

As the microsymbiont, the mycorrhizal fungi benefit because they get to use carbohydrates produced by the plant for their own growth. In exchange, they provide the plant with nutrients and water.

Roundworms gain resistance – how to protect your sheep

BY WHIT STEWART

Sheep that graze on irrigated acreage, especially intensively grazed, high-traffic pastures, any time during the summer are at risk of ingesting internal parasites (gastrointestinal nematodes) that can cause illness, lost production or death. Worse, these parasites may be resistant to your dewormers.

Irrigated operations (flood, sub-irrigated, sprinkler) provide an optimal environment for stomach worms that migrate through water from the fecal pellet to the grass where sheep graze. The barber pole worm (*Haemonchus contortus*) of the Trichostrongyloidea family of roundworms can cause significant losses.

As the parasite matures, it consumes blood inside the digestive system (abomasum), causing severe anemia, damage to digestive function, lack of growth, and in severe cases, death. Adult worms shed more larvae onto pasture, exacerbating infection and losses.

Used to be, anthelmintic (dewormer) treatments were a rest-assured management strategy. Recent research, however, has identified widespread resistance to dewormers in the Mid-Atlantic states, with resistance seen on 24 to 100 percent of farms for the various drug classes.

Resistant worms pose a serious threat as they transfer genetics to their larvae, accelerating resistance to an already limited spectrum of available products.

Are They Resistant?

Sheep researchers at University of Wyoming and Montana State University and parasitologists at the University of Georgia in 2017 completed the first year of a two-year study funded by the U.S. Department of Agriculture Western SARE (Sustainable Agriculture Research and Education) to detect drug resistance in barber pole worm larvae.

Fecal samples from irrigated sheep operations in Wyoming and Montana were shipped

to Georgia for analysis to determine levels of resistance. First-year results from six ranches indicate moderate to high resistance to benzimidazoles (Valbazen®, Safe-Guard®). Parasite resistance to levamisole (Prohibit®) was seen on five of the six ranches sampled, and resistance to ivermectin (Ivomec®, Eprinex®, Dectomax®) was seen on four. No resistance to moxidectin (Cydectin®) was detected.

For many Wyoming range sheep producers, internal parasites are not a significant challenge, but purchases from resistant flocks could introduce the threat.

Does My Dewormer Still Work?

With rising input costs (e.g. feed, animal health and labor), it's important that drugs are effective (defined as reducing internal parasite burden by at least 95 percent) and strategically applied. Sampling individual animals prior to treatment and re-sampling 14 days after treatment can help. Results provide critical information about which deworming products are still effective on an individual sheep operation. Applying the right one can ensure optimal ewe productivity and lamb growth.

Hands-on assessments such as the FAMACHA® scoring system can be used to identify at-risk sheep. The scoring system provides a color chart to match to the color of the mucous membranes of the sheep's eyes. On a scale from one to five, one is not anemic and five is severely anemic.

Submitting fecal samples to the Wyoming State Veterinary Laboratory in Laramie for analysis before major sheep working events can guide whether or not to treat the flock. Pathologist Berit Bangoura and staff can conduct laboratory assays to identify the type and quantity of internal parasites. Results can guide treatment or if negative, provide valuable peace of mind during the grazing season.

The cost is modest and the sampling and mailing process is simple. Submission forms and

instructions can be found at bit.ly/accessionform. By comparison, with a cost per head of \$.32 to \$1 for deworming, the savings from testing sheep throughout the year can be significant.

Steps to Stay Ahead

1. If managing smaller flocks on irrigated and sub-irrigated pastures, assess more frequently whether and how well dewormers are working.
2. Selectively deworm animals that require treatment versus mass treating the entire flock. Selective deworming minimizes drug use and slows drug resistance in internal parasites.
3. On irrigated acres, implement a rotational grazing strategy that rests pasture 20 to 30 days to reduce ingestion of worm larvae.
4. Maintain a forage height greater than six inches to prevent sheep from grazing the lower portions of plants where nematodes are most abundant. The internal parasites are less abundant in the upper canopy of the forage stand.
5. Graze horses prior to sheep to reduce worm populations. This provides a dead end for the barber pole worm and contributes to an integrated approach.
6. Consider deworming after lambing and weaning. Lambs are generally more susceptible to parasites than older sheep, and twin-bearing ewes are more susceptible than single-bearing and non-lactating ewes.

Whit Stewart is the UW Extension sheep specialist and assistant professor in the College of Agriculture and Natural Resources Department of Animal Science. Contact him at 307-766-5374 or whit.stewart@uwyo.edu.

For more information on this study and participation in summer 2018, contact Stewart.

The U.S. Department of Agriculture 2012 Census of Agriculture identifies 771 agricultural operations in Wyoming that rely on sheep and wool as their major source of revenue.



Tiny weevils cause big losses for hay producers

BY JEREMIAH VARDIMAN AND SCOTT SCHELL

As few as two alfalfa weevil larvae per plant stem can cause yield losses of more than 400 pounds per acre in the combined first and second cuttings, and feed quality of the harvested hay is reduced. Many alfalfa hay producers report spraying for the pest at least once a year to save alfalfa yields.

Alfalfa Weevil Life Cycle

In Wyoming, most adult alfalfa weevils overwinter in the leaf debris and crowns of alfalfa plants and become active in the spring when average temperatures warm to above 48 degrees. Female weevils chew holes in new and dead alfalfa stems and deposit yellow eggs in clusters of five to 40. Each female lays 400 to 1,000 eggs a season.

In the Midwest and Southern Plains, adult weevils become active and start depositing eggs in the fall. This may be happening in Wyoming during years with long, mild falls.

After hatching, new larvae – called first instars – are very small, approximately 1/20-inch long. They emerge from the stem, crawl up to the stem tip and burrow into the leaf whorl head first. There they feed and stay hidden until late in their second larval instar stage. As the plant grows, the leaves unfold, exposing the larger weevil larvae and skeletonized leaves.

After weevils reach the fourth instar stage of larval development, they move to the base of the plant where they spin a cocoon, pupate into adults and start the life cycle over again. The third and fourth weevil larval instars do the greatest damage during a time that coincides with the first cutting of the hay.

New Tool Predicts Peak Populations

Because alfalfa weevils grow and develop incrementally with increasing spring temperatures, a growing degree-day (GDD) calculator can be used to determine the approximate dates to monitor fields for damage and time insecticide spray applications.

A GDD chart published by UW Extension in 1993 was intended to give farmers approximate calendar dates for monitoring critical weevil activity. It was not very precise, however, because varying spring weather can change weevil development by several weeks from year to year.

Extension is now tailoring a generalized online GDD calculator to utilize local weather station temperature data for more accurate predictions. The program will allow producers to more precisely time weevil monitoring and sampling to coincide with critical periods in the pest's life cycle.

For example, with spring-deposited weevil eggs, the larvae should reach peak second instar at 425 degree-days. The GDD prediction tool will make



Arrows point to three third- and fourth-stage larvae. Black heads and pale stripes allow them to blend into the skeletonized foliage.

scouting for the pest more efficient and accurate and facilitate decisions to treat or harvest early before significant yield losses occur.

We are now working with growers in the Big Horn Basin in the ground truthing phase of the GDD calculator development. We will know better how accurately the online GDD calculations predict important sampling dates after the 2018 field sampling season.

Observations and Progress

The first year's data collections reveal one-year-old adult weevils with new adult weevils and larvae in multiple stages on the same sampling dates. This suggests multiple hatches and overlapping life cycles and could help explain why weevil populations in Wyoming are more difficult to manage than in the past.

Research findings from South Dakota and Utah indicate adult weevils do not always overwinter or spend the summer inactive period in the alfalfa fields. Alfalfa weevils can fly, and in South Dakota, they have been found to move into tall, thick vegetation on the field border. In Utah, they have been found a couple miles up canyons adjacent to the fields.

It is not known where most weevils in Wyoming spend their summer dormancies. Modifying the weevil's preferred dormancy habitat inside or outside the fields may offer another opportunity for control.

University of Wyoming Extension recommends using integrated pest management, which combines multiple control tactics to reduce alfalfa weevil crop damage. Within the university and in the region, we are working to develop recommendations for better cultural practices, insecticide choices and application timing for better economic control of this pest.

Along with improving the GGD calculator, this combination of practices should help Wyoming hay producers better manage this costly pest.

Jeremiah Vardiman is the UW Extension agriculture and horticulture educator in Powell. Contact him at 307-754-8836 or jvardima@uwyo.edu.

Scott Schell is an entomology (insect) specialist in the UW College of Agriculture and Natural Resources Department of Ecosystem Science and Management. Contact him at 307-766-2508 or sschell@uwyo.edu.



After harvesting a heavily infested field, this hay swather is crawling with light green alfalfa weevil larvae. Early harvest of the first cutting can kill larvae, but hay quantity and quality are affected. If eight or more larvae per square foot of hay stubble survive harvest, pesticide treatment is advised to protect the second cutting.

Stack hay high and dry to weather major blizzards and floods

BY SCOTT COTTON

In the West, our greatest livestock losses, other than from disease, are caused by blizzards and floods – not the average winter storm or spring flooding but the exceptional events, like the old folks talk about “the Blizzard of ’49.”

Since 1995, more than a quarter million cattle have perished in blizzards and floods in the western United States. Most losses occur in early fall or late spring when extreme weather is more unexpected.

Severe blizzards and heavy floods typically dissipate within seven to 10 days, but that period until near-normal conditions return is crucial. Being able to move livestock to shelter and provide feed are critical for livestock herd survivability, and two principles of feed storage have proven to make a difference.

I call this combination of practices high and dry feed.

During blizzards, feed that lies in lower areas where snow collects is often inaccessible. During floods, it can be difficult to bring feed and animals together if rivers and streams separate feed stacks from herds. In both cases, agriculture producers may find they are putting livestock, equipment and their lives at risk if they attempt to feed normally.

Also, feed is often kept near calving barns or the homestead to minimize fuel consumption and labor costs. Many of these sites are low and out of the wind, but feed yards on rises or hilltops usually blow off.

For those times when conditions go past normal, consider locating some feed reserves high and dry. Here are my recommendations developed after working with producers through numerous blizzards and floods:

- Stack two weeks of feed on a rise or ridgetop according to how many head you have in each pasture or paddock. Be especially aware of placing feed where livestock will be in early fall and late spring.



Photo: Scott Cotton

Livestock producers in the Rocky Mountain West tend to be well-equipped, well-versed and prepared for most climatic events. High and dry feed takes that one step further.

- Place stacks in line with dominant winds so the snow blows by them and does not accumulate behind the hay.
- During blizzards and floods, livestock can be hand-fed from the lee (windless) side of a stack, which also provides alternative shelter for animals until the crisis passes.
- If rivers or streams separate parts of your property or herd, place two weeks of feed on each side of those watersheds. Remember, as little as three inches of flood water can take a traditional ranch pickup downstream and roll it. Flooding rivers and streams can be deceptively dangerous and cause many deaths each year.
- If possible, place stacks near a good road or access to a nearby maintained road (which also usually blows off) so you can reach the hay and haul it to other areas or neighbors if needed.
- Talk with your neighbors about your disaster weather plan and why your hay is stacked as it is. Plan to help one another. If you cannot access the stacks during a blizzard or flood, perhaps they can.
- If you are especially prone to blizzards or flooding, consider purchasing special equipment, such as snow machines or a boat, to help you manage these events. Maintain them well, and be sure you are trained to operate them under difficult conditions.
- Finally, remember that UW Extension is available near you, on campus and online to help you reach your goals.

Scott Cotton is the UW Extension area educator serving Converse, Natrona and Niobrara counties. His specialties include range management, livestock production, rural acreage management and agriculture and disaster resilience. Contact him at 307-235-9400 or scotton1@uwyo.edu.

Fetal programming through nutrition could be a game-changer

BY CHANCE MARSHALL

For most spring calving operations in Wyoming, the last trimester of gestation coincides with the first few months of the year when cold temperatures, wind and snow can be harsh. Approximately three-quarters of fetal growth occurs during the final 60 days of pregnancy, and research shows nutrition at this time plays a greater role in reproductive efficiency and future herd performance than we might have thought.

During the last trimester, the dam's nutrient demands are high because she has to maintain herself through winter conditions, grow the fetus and prepare for lactation. The hay she's fed during this period may lack the nutrients (protein and energy) required to meet these demands. If the dam does not receive supplemental nutrients, the development of the fetus may be restricted.

Studies conducted at the University of Nebraska-Lincoln compared performance of

offspring from protein-supplemented dams to non-supplemented dams. Results suggest while protein supplementation during late gestation doesn't necessarily improve the cow's future pregnancy success, it provides lasting benefits to her offspring.

Improved Weight and Performance

Newborn calves from sufficiently nourished dams weighed 4.5 pounds more on average than calves from nutrient-restricted dams.

The research showed steer progeny from protein-supplemented dams were heavier at birth, had increased carcass weights and were more likely to grade Choice than steers born to non-supplemented dams.

Heifer calves born to supplemented dams grew faster, reached puberty earlier and had higher pregnancy rates than heifer calves born to non-supplemented dams.

In contrast, poor prenatal diets were shown to hinder muscle development and increase subcutaneous fat.

Impacts to Feed Efficiency

The University of Nebraska-Lincoln studies also showed maternal nutrition affects the calf's ability to absorb and utilize nutrients. Because immature ruminants do not have fully functional gastrointestinal systems early in life (rumen is bypassed), nutrient absorption through the small intestine is critical.

Calves born from dams that were nutrient-restricted during pregnancy had longer small intestines than calves born from dams fed their nutrient requirements. Longer small intestines generally mean longer feed retention and a greater ability to efficiently absorb nutrients throughout life.

This adaptive response provides an advantage but at a cost. In an earlier study, increased

continues page 12

continued from page 2

plants, 2. start seeds indoors using pots that can be transplanted easily into the garden, 3. purchase plants from a nursery or greenhouse.

If opting for option two, timing the seed planting is critical. If seeds are started too late, you will delay outdoor planting. If you plant them too early, plants will likely outgrow their containers, making them difficult to transplant. Keep in mind some plants can be transplanted easily, while others are more difficult. Plants will most likely need to be “hardened” to acclimate to the outside conditions. Find more information on starting seeds inside at bit.ly/Startingseeds.

Crop Selection

Growing crops that will be consumed is a good first step when selecting vegetables. It is easy to become mesmerized by the beautiful shapes and colors of vegetables in seed catalogs and publications. Unfortunately, many of the beautiful crops we see in catalogs are not well suited to Wyoming. Selecting crops that enjoy cooler temperatures and have a short days to maturity

value is important. For more information about days to maturity values and warm season and cool season crops, check UW Extension Bulletin-1115, “Gardening: Vegetables in Wyoming” at bit.ly/WYveggiegarden.

Once you’ve selected crop varieties, it’s a good idea to purchase seeds or established plants from a reputable source. Sometimes seeds arrive mislabeled or don’t germinate. Find companies that back their product. When selecting plants at a nursery or greenhouse, avoid transplants that are diseased or damaged.

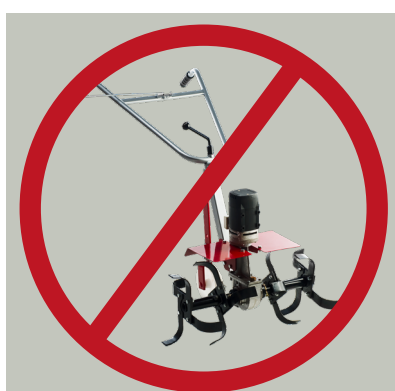
Marking the garden space

Measuring the space needed before planting is helpful. Row spacing and area needed for crops are outlined in UW Bulletin-1115 (bit.ly/WYveggiegarden). Vertical structures, different planting densities, companion crop planting and varied row spacing and design can be used to maximize space in your garden. Also consider short versus tall crops, so plants are not crowded or shaded out during the growing season.

Making a plan that allows for crop rotation among garden beds and rows of the garden is fundamental. Crops should be moved to a new spot every year and not planted in the same spot for at least two to three years. Plants from the same family or those with similar nutrient requirements should not be planted in the same spot each year. Crop rotation helps break up disease cycles and avoid depletion of soil nutrients.

Although it may be many weeks before most of us in Wyoming can plant our gardens, there is plenty to think about: what crops to plant, how to plant, when to plant, companion planting, crop rotation and varieties with short days to maturity values. A little planning will help you get your garden into tiptop shape for not only this year but many seasons to come.

Brian Sebade is the University of Wyoming Extension educator and Master Gardener coordinator based in Albany County and serving southeast Wyoming. Contact him at 307-721-2571 or bsebade@uwyo.edu.



Here’s what a rototiller can do for your garden

- **Help weed seeds germinate.**
- **Hinder hard-working earthworms.**
- **Discourage friendly fungi.**
- **Take out essential organic matter.**
- **Compact soil.**
- **Promote erosion.**

continued from page 8

water and hard-to-access nutrients such as phosphorus and iron.

Through the process of photosynthesis, plants convert carbon dioxide from air and water and nutrients from the soil into carbohydrates for energy and growth. They grow bigger, healthier and more resistant to drought and other stress.

Perhaps this year, designate one garden area as no-till and slowly experiment with reducing tillage in the rest of the garden. Instead of three passes, try two. Instead of tilling in the fall and spring, try tilling in the spring only. Over time, your soil will improve and your garden will thrive with less effort and fewer inputs.

Step Two: Love a Messy Garden

Think about the way Mother Nature does it. As leaves fall and plants die, they cover the surface of the soil and are eaten by bugs,

worms and eventually microbes – the original recyclers. When you pull weeds in the garden, use them as mulch. This keeps the surface of the soil cool, conserves water and slows weed growth.

Add grass clippings in the summer and leaves in the fall. As these organic materials decompose, they feed the worms and microbes, provide plant nutrients and improve the health and tilth of the soil.

Bare soil gets hot! Mulch keeps the soil protected from the drying sun and wind and conserves water, which means less money and time spent on irrigation. Mulch also prevents some weed seeds from germinating, which means less time weeding and more time harvesting.

Compost and manure can be added in the fall after harvest. This gives the worms and microbes plenty of time to start their work and reduces the risk of burning new

seedlings. Instead of incorporating a large quantity of compost or manure with the rototiller, consider adding a thin layer (.5 to 1 inch) every fall and letting nature’s rototillers do the work for you.

In the spring when you are ready to plant, pull back the mulch that has protected and fed the soil all winter and look at the rich, healthy soil underneath. All you need is a shovel and rake to get the garden ready for seeds and transplants. As you rely less on the rototiller and more on nature, your soil will improve and gardening will get easier and more efficient.

So now, what are you going to do with that rototiller collecting dust in your garage?

Caitlin Youngquist is a UW Extension educator serving the Big Horn Basin. Her specialties are soil quality, composting, manure management and livestock mortality. Contact her at 307-347-3431 or cyoungq@uwyo.edu. Visit her website at www.drcaitlin.us.

continued from page 11

sickness and death were recorded for calves born to dams receiving 65 percent of their dietary energy requirements during the last 90 days of gestation. The same study showed a higher percentage of calves treated for sickness in the feedlot and fewer weaned from nutrient-restricted dams.

Greater Vigor and Survival

Supplementing a cow during late gestation, or at least keeping her from losing weight, does a lot more than keep the cow in good body condition.

Calves born to dams receiving 100 percent of their dietary energy requirements were healthier and more likely to survive.

The long-term benefits most certainly outweigh the short-term savings in feed inputs. UW Extension educators and specialists can help you analyze your feed and herd nutrition and avoid nutritional pitfalls during the critical calving period.

Chance Marshall is an agriculture and horticulture educator specializing in livestock systems in Fremont, Hot Springs, Washakie, Big Horn and Park counties. Contact him at 307-332-2363 or cmarsha1@uwyo.edu.

Trade or brand names used in this publication are used only for the purpose of educational information. The information given herein is supplied with the understanding that no discrimination is intended, and no endorsement information of products by the University of Wyoming Extension is implied. Nor does it imply approval of products to the exclusion of others that may also be suitable.

Issued in furtherance of extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Glen Whipple, director, University of Wyoming Extension, University of Wyoming, Laramie, Wyoming 82071.

Persons seeking admission, employment, or access to programs of the University of Wyoming shall be considered without regard to race, color, religion, sex, national origin, disability, age, political belief, veteran status, sexual orientation, and marital status. Persons with disabilities who require alternative means for communication or program information (Braille, large print, audiotape, etc.) should contact their local UW Extension office. To file a complaint, write to the UW Employment Practices/Affirmative Action Office, University of Wyoming, Department 3434, 1000 E. University Avenue, Laramie, WY 82071.