

BARNYARDS & BACKYARDS

UW Cooperative Extension Service  Profitable & Sustainable Agricultural Systems



UNIVERSITY
OF WYOMING



U.S. Department
of Agriculture Risk
Management Agency

Extension team puts resources to work for you

By Bridger Feuz

On behalf of the University of Wyoming Cooperative Extension Service and the Profitable and Sustainable Agricultural Systems (PSAS) Initiative Team, I welcome you to the fifth year of our efforts to provide you, the people of Wyoming, with a newspaper insert entitled *Barnyards & Backyards*.

Our goal with this outreach effort is to share educational resources and information on a variety of topics of interest to you, our clientele.

Past *Barnyards & Backyards* inserts, as well as additional information, can be viewed at www.insuringsuccess.org. You can also catch our page titled

"Barnyards & Backyards" in the *Wyoming Livestock Roundup* each month. The PSAS team hopes these inserts are beneficial, and we hope you enjoy reading them.

All articles are written by UW personnel and other members of the PSAS Initiative Team, and they address a variety of topics. I hope you will take the opportunity to contact any of the authors for additional information, and contact me to suggest future topics. I can be reached at (307) 783-0570 or brfeuz@uintacounty.com, or contact a local extension educator. Contact information is at <http://ces.uwyo.edu/Countries.asp>.



Bridger Feuz

Agriculture's Impact: It's all in your perspective

By Thomas Foulke

Agriculture's impact on Wyoming's economy can be viewed from different perspectives.

The traditional way is to look at revenues. The Department of Commerce reports the gross domestic product (GDP) by state figure for Wyoming crop and livestock production totaled \$276 million in 2006 (latest year available). This amounts to less than 1 percent of the total Wyoming GDP value of \$29.9 billion.

That does not look like much compared to the \$9.6 billion contributed by Wyoming's mineral industry; however, this may not be a fair comparison since the mineral industry dwarfs all other industries in Wyoming, providing about one-third of the state's GDP.

Agriculture is important in terms of commodity production.

Wyoming Agricultural Statistics reports that, in 2007, agricultural lands in Wyoming produced:

- 771 million pounds of beef,
- 45.1 million pounds of sheep and lamb,
- 3.4 million bushels of wheat,

- 4.7 million bushels of barley,
- 7.7 million bushels of corn for grain,
- 2.4 million tons of hay.

Value added to the U.S. economy by Wyoming agriculture was valued at \$1.28 billion in 2006 (latest). It also represented \$114.5 million in net farm income. This income and earnings supported 11,970 agricultural jobs in the state.

While Wyoming probably would not be considered a "bread basket" in terms of agricultural production, it does rank among the top 25 states for production of 13 agricultural commodities. The state also is first in terms of average size of ranches and farms and eighth in terms of total land in agriculture.

Another way of evaluating agriculture's impact on the state is through land area. About 48 percent of Wyoming's surface area is owned by the federal government. A further 9 percent is owned by state and local governments. That leaves approximately 43 percent in private hands. Of that amount, about 93 percent, or 25 million acres, is in agriculture. The average size of a Wyoming ranch/farm is

3,909 acres, the largest in the country (*Wyoming Agricultural Statistics* for the reporting year 2007). This is land that is largely being maintained and managed as a valuable natural resource by citizens with a vested economic interest in preserving their land resources. Many agricultural operations graze on large areas of public lands in the state. This means agriculture's geographic footprint in the state is much larger than its economic one.

Combining both of these perspectives shows agriculture has a larger reach in our society than is first apparent. This is because most land-management decisions in the state will have some sort of agricultural component. Whether mineral development, public lands grazing, recreation, wildlife disease interaction or endangered species questions, all of these issues in some way interact with agriculture and agricultural land use. Viewing agriculture's impact in broader terms gives us a better understanding of its important role in our society.

Thomas Foulke is a research scientist in the College of Agriculture's Department of Agricultural and Applied Economics. He can be reached at (307) 766-6205 or foulke@uwyo.edu.





Risk management courses available at InsuringSuccess.org

By James Sedman
and John Hewlett

Production agriculture is a volatile industry, and current economic conditions are introducing even greater sources of change.

Proper risk management is crucial and can help to achieve producer goals for protecting revenue and maintaining profitability. There are eight online courses at InsuringSuccess.org that cover a wide range of pertinent risk management topics. *Insuring Success* is a collaborative education effort of Western universities, businesses, and other professionals. These courses can be viewed online, or CD-copies may be requested on the Web site. Simply point your browser to InsuringSuccess.org, and follow the links to CD-based Education.

Risk Management and Crop Insurance

The broad array of crop insurance options is discussed in the *2008 Insurance and Risk Management Course*. This course takes a comprehensive look at the overall topic of risk management by first defining and identifying various sources of risk in an operation. It then discusses, with examples, the various programs available through the Federal Crop Insurance Corporation pro-

gram administered by the U.S. Department of Agriculture's Risk Management Agency (RMA). The course outlines insurance policies available for crop and livestock producers in terms of individual and group policies and the various yield- and revenue-based policies available.

The second course available in the area of crop insurance is the *AGR-Lite Training Course*.

AGR-Lite (or Adjusted Gross Revenue-Lite) was introduced in 2007 as a whole-farm revenue insurance alternative for crop and livestock producers. This course was designed as an aid to producers to learn more about AGR-Lite and to discover if it will effectively fit into their risk management planning. The course summarizes the application process and needed financial statements as well as the process for identifying an insurable loss under AGR-Lite.

Estate Planning and Risk Management

An often-overlooked aspect of risk management is estate planning. Proper estate planning is essential for a smooth transition of ownership as well as the successful protection of a farm or agribusiness. InsuringSuccess.org offers a two-part course titled *A Lasting Legacy*. This course was designed as a comprehensive

look at building a personal legacy through family interaction and planning. Overall, the course can provide excellent guidance for individuals seeking to build an estate plan and a lasting legacy.

Business and Strategic Planning and Risk Management

Proper planning, goal setting, and tax management are all parts of effective risk management. Four courses are offered on InsuringSuccess.org dealing with business planning, goal setting, and taxes as well as starting a new or alternative business. These courses can provide new insight for individuals seeking to start or improve a farm business. The *Feasibility of Alternative Rural Enterprises* course was designed to help rural residents assess and evaluate plans for a rural-based enterprise. Course participants learn to use SWOT (strengths, weaknesses, opportunities, and threats) analysis as well as defining their enterprise. Strategies for planning and feasibility analysis are outlined in detail.



The *Strategic Planning and Goal Setting* and *Resource Inventory* courses are part of the *Enterprising Rural Families* project. These courses focus on how to combine the needs, values, and visions of people into a family enterprise system. Both were developed by a team of academic professionals from Wyoming and Canada combining visual, audio, and written materials along with shared experiences of other students and families, some from abroad. Families learn to use goal setting

and sound business practices for both short- and long-term challenges and to develop long-term resiliency.

For More Information

To participate in any of the eight *InsuringSuccess.org* courses, simply log on and follow the link to CD-based Education at the site. For more information on the topics covered here or other risk management topics on the Web, visit the Western Risk Management Library at agecon.uwyo.edu/riskmgt.

James Sedman is a consultant to the University of Wyoming College of Agriculture's Department of Agricultural and Applied Economics, and John Hewlett is a farm and ranch management specialist in the department. Hewlett may be reached at (307) 766-2166 or hewlett@uwyo.edu.



Extension's Profitable and Sustainable Agricultural

The Profitable and Sustainable Agricultural Systems Initiative Team is a group of University of Wyoming Cooperative Extension Service (UW CES) educators and specialists.

The team is dedicated to providing objective, research-based information to Wyoming people – focusing on improving the sustainability of Wyoming lands for horticulture, small acreages, crops, and livestock production. As you can see from the articles in this insert, the team takes on a broad spectrum of topics.

In addition to the insert, we also publish a monthly page in the *Wyoming Livestock Roundup*, offer Web-based information, organize traditional livestock and crops workshops, and teach intensive programs focused on ranching, farming, horticulture, and other topics.

We invite you to participate in some of these other offerings and would like to give you a feel for what we have to offer. For

more information on the team's offering, visit www.wyoag.net.

One of the efforts of this group is the www.insuringsuccess.org Web site. On this site, users are able to view past inserts as well as Barnyards & Backyards pages in the *Wyoming Livestock Roundup*. Additionally, users are able to access a variety of CD-based and online educational programs. The program offerings include: Feasibility of Alternative Rural Enterprises, Taxes for Agricultural Enterprises, Strategic Planning and Goal Setting, A Lasting Legacy courses 1 and 2, 2008 Insurance and Risk Management, Resource Inventory, and AGR-Lite Training.

Fremont County Farm & Ranch Days and WEST! Ag Days headline our efforts to provide traditional livestock and crops workshops. These programs occur in early February and are a

great place for farmers and ranchers alike to get timely research-based information to enhance their ability to be successful.

Example topics in this year's programs were: attracting and keeping agriculture labor, soil moisture sensor monitoring, ranching and farming with joint pain, putting livestock genetic tools to work, managing and marketing cull cows, horse nutrition, small on-farm oil seed crushing, and biodiesel.

Our team also recognizes the importance of

offering intensive educational programs that provide a more robust opportunity for participants to learn about particular topics. Currently, we have offerings that focus on farm management (Beginning Farmer Challenge Group), ranch management (Wyoming Master Cattleman Program), and horticulture (Master Gardener).

Beginning Farmer Challenge Group is a new program that was offered in northwest Wyoming. The program consisted of nine sessions focused on farm financial, marketing, and business planning. Participants were pro-





UW researches ways to determine high-sexually active rams

By Brenda Alexander

Research in the University of Wyoming’s College of Agriculture seeks ways to identify high- and low-sexually performing rams in flocks.

If poor-performing rams were identified and removed from a flock, cost savings may be realized because of decreased numbers or rams required for breeding success and a decrease in associated maintenance costs such as feed, shearing, and replacement. Other benefits may include increased conception rates and ewes conceiving earlier in the breeding season resulting in more, heavier lambs at weaning.



The identification of high-sexually performing rams that possess desirable production traits would promote more rapid incorporation of those traits into a flock and the production of more valuable offspring.

Ram Selection Vital

Ram selection is fundamental to the profitability of a flock and is based on desired physical and performance traits.

The selection processes, however, rarely include an evaluation of ram sexual behavior even though the ability and desire to mate with ewes in estrus is required for the incorporation of superior genetics into a flock.

Of the 196,000 rams nationwide, 23 percent are predicted to have inadequate breeding behavior. Identifying and eliminating these rams from the flock would save U.S. producers \$13.5 million in ram costs alone.

Differences in mating behavior exist among individuals of all species. Research suggests as many rams could be culled for poor mating behavior as are currently culled for physical limitations or poor semen quality. Research at the U.S. Department of Agriculture Agricultural Research Service’s U.S. Sheep Experiment Station near Dubois, Idaho, confirmed twice as many poor-performing rams were needed to obtain breeding results equal to a single high-sexually performing ram (Stell-



flug, 2005). Inadequate mating behavior results in the need for additional rams, extends the lambing season, and decreases the number of lambs born per ewe lambing.

30 percent May Be Non-Performers

Researchers in 1964 classified approximately 30 percent of rams at the U.S. Sheep Experiment Station as non-performers. Nearly 30 years later at the same station, a similar number of rams were reported to be non-performers.

Although sexual interest, or libido, of rams is necessary for the incorporation of desired genetics into a flock, ram mating behavior is rarely evaluated due to constraints of time, labor, and physical facilities necessary for such tests. Because the economic benefit of behavior testing rams is high, alternative

means of identifying rams with undesirable mating behavior is desirable.

Genetic markers used for the identification of either superior or inferior performing rams would allow producers to reduce ram costs and accelerate incorporation of desired genetics into their flocks. For this project, ram lambs (6-9 months of age) exhibiting behavior that typifies high-, low-, and non-performing rams will be selected from the University of Wyoming flock.

From those rams, the preoptic area of the hypothalamus (within the brain) will be used for gene expression analysis. Uniquely expressed genes will be further evaluated as potential genetic markers. Genes expressed within the preoptic area are of special interest because of the importance of this area in the development and expression of male sexual behavior.

Verifying Production and Reproduction Performance

Since ram selection is usually based on desired production traits, the presence or absence of correlations between production and reproductive performance must be verified. The discriminating value of production traits for mating behavior will be evaluated to determine if measures of production may serve as indicators of reproductive performance.

This possibility is being tested in rams cosigned to the Wyoming white-faced ram test by consenting producers. Reproductive behaviors are being tested, and expressed behavior will be correlated to feedlot production traits. Only one year of data has been collected to date, which precludes determination of any conclusions in this four-year study.

The incidence and economic impact of low- and non-sexually performing rams in a selected producer flock is also being determined. By determining the incidence of rams with poor-mating behavior within producer flocks, the breeding success and economic costs of the flock rams can be determined.

Brenda Alexander is an assistant professor in the Department of Animal Science at the University of Wyoming College of Agriculture. She can be reached at (307) 766-6278 or balex@uwyo.edu.

Systems team has a lot to offer Wyoming

Master Cattleman
W Y O M I N G

vided with sufficient information to be able to construct a business plan for their farm. This program challenged participants to think comprehensively about their operations, interact closely with peers, and build management skills.

The Wyoming Master Cattleman Program is a set of classes to help producers analyze new opportunities to determine if they will meet their financial expectations, goals, and risk tolerance. Additionally, producers will learn strategies for cull cow management, retained ownership, niche marketing, scientific tools for bull selection, alterna-

tive ranching systems, and estate planning. This program is in its third year with more than 100 producers taking the classes.

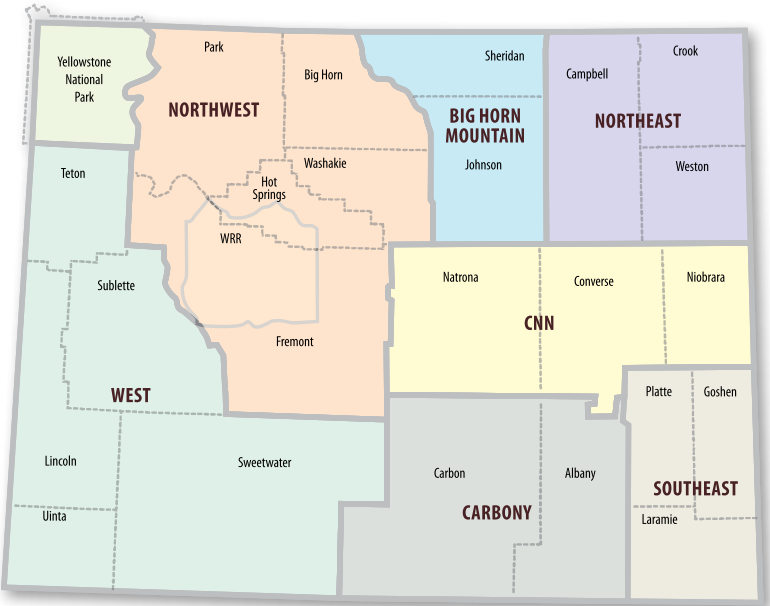
The Master Gardener program is well established in Wyoming, offering horticultural enthusiasts the opportunity to learn Wyoming-specific horticulture information. This program consists of 40 hours of training, and participants are then asked to donate 40 hours of service back to their communities. Example topics include botany basics, weed management, basic entomology, lawns, diagnosing plant problems, and plant propagation.

Area UW CES educators who belong to this team are available to assist you on an individual basis on many aspects of agriculture production, rural living, and horticulture so please give them a call or stop by one of their offices.

Area Educators include:

Northeast Extension Area – Lindsay Taylor, (307) 682-7281; **Big Horn Mountain Extension Area** – Scott Hininger, (307) 674-2980; **CNN Extension Area** – Tammie Jensen (livestock), (307) 334-3534, and Donna Cuin (horticulture), (307) 235-9400; **Southeast Extension Area** – Jeff Edwards, (307) 532-2436; **Carbony Extension Area** – Kellie Chichester-Jameson, (307) 721-2571; **Northwest Extension Area** – Ron Cunningham, (307) 332-1044, Sandy Frost, (307) 754-8836, and Jim Gill, (307) 347-3431; **West Extension Area** – Bridger Feuz, (307) 783-0570, and Hudson Hill, (307) 885-3132.

The Profitable and Sustainable Agricultural Systems Initiative Team is also supported by several state specialists from the University of Wyoming. These specialists are also a great resource for Wyoming.



They are: Cole Ehmke (cehmke@uwyo.edu) – Agricultural Entrepreneurship and Personal Finance; Bridger Feuz (bmfeuz@uwyo.edu) – Livestock Marketing; John Hewlett (hewlett@uwyo.edu) – Farm and Ranch Management; Steve Paisley (spaisley@uwyo.edu) – Beef Cattle Specialist; Karen Panter (kpanter@uwyo.edu) – Horticulture; John Ritten (jritten@uwyo.edu) – Agricultural Economics; and Jennifer Sue Thompson (jsjones@uwyo.edu) – Small Acreage.



Considerations for small wind systems in Wyoming

By Lindsay Taylor

Wind energy is a familiar technology to many Wyoming residents.

There was a time wind was the most common form of energy used at the farmstead. Windmills were used to pump water and run the first of many electrical appliances to come into a home.

While today's technologies are more efficient and utilize electrical rather than mechanical energy, the concept is very much the same and can still be used on a farm or at a rural residence to offset our growing electricity needs and rising costs.

Residential wind energy, termed "small wind," is wind electricity generation of less than 10 kilowatts (kW). The average American home uses about 20 kilowatt hours (kW-h) per day. Residential scale wind development is much different than the commercial wind development projects seen throughout the state. Turbines are much smaller, as they are typically generating electricity for only one home rather than a region and they are much less invasive on both land and scenery.

Residential-sized turbines can be used to supplement existing electricity use or in a hybrid system designed to power a home or farm without tying into the existing power grid. Each of these uses has its own benefits, drawbacks, and considerations.

Small Wind Turbines

A small wind turbine tied into the utility power grid can be practical for people who live in a rural residential location near an existing power line. To be a feasible option, the basic requirements are more than one acre of land in a place with no restrictions on tall towers, a known amount of electricity used, substantial wind, and economic feasibility. If the property to be powered sits on less than

one acre, siting a wind turbine in a place with unobstructed wind flow may be difficult. Typically, a 100- to 160-foot tower is needed for unobstructed and maximum potential wind access. Placing a turbine too low or behind trees and buildings is like putting solar panels in the shade.

Sizing of the system is the main factor in determining upfront costs. For most grid-tied systems – those producing electricity that flows onto the power grid – having a turbine that produces more electricity than is needed by the farm or residence is not cost effective. To determine individual needs, the number of kW-h used in one year is divided by the number of hours in a year, 8,760, and then divided by the capacity factor for the site. The number of kW-h can be found on old electricity bills. The capacity factor of the site depends on the wind resource. This number is the percentage of time the wind blows hard enough for the turbine to produce at maximum capacity. For most small applications, this number is between 15 and 25 percent. Currently, small wind turbines cost anywhere from \$2,000 to \$7,000 per installed kW.

Important Considerations

The two most important considerations are the wind resource and economic feasibility. These two factors are directly related because the better the wind resource the more electricity can be generated by the wind turbine and the more quickly the turbine can return its upfront costs to the owner.

There are many advantages of using wind power to supplement electricity needs, ranging from self-sufficiency to environmental benefit to providing energy with little or no water requirement; however, most people will not embrace the technology unless it is cost competitive with existing sources of power. Wind energy is economically

Example of wind turbine sizing:

750 kW-h average monthly use
× 12 months =
9,000 kW-h annual use

(9,000 kW-h) ÷
8,760 h/year) = 1.03 kW

(1.03 kW) ÷
.20 capacity factor =
5.14

In this case a 5-kW turbine would be a sufficient-sized tower

comparable if the upfront costs can be recouped in electricity savings before the end of the useable life of the equipment. The four factors that will determine this are the wind resource, average monthly electricity costs, state and federal policies, and financing.

Wind Resource

Most of Wyoming has a high enough average annual wind speed to consider wind generation. A general rule of thumb is greater than 10 mph. For a better look at the map of Wyoming's wind resource shown below, please see www.windpowerin-gamerica.gov/wind_maps.asp. Without actual data collection from a specific site, determining the true wind resource is difficult; however, this map is a way to get a fair idea of a site's potential. If a site-specific study is desired, the Wyoming Business Council offers an anemometer loan program. An anemometer placed on site for a year will provide specific wind speed data that can be useful in a decision to purchase or site a wind turbine. The annual energy output (AEO) of a wind turbine is equal to 0.01328 (a constant) × rotor diameter² × wind speed³ so small increases in wind speed translate to big gains in energy output. For more information on the Wyoming Anemometer Loan Program, contact Tom Fuller at (307) 777-2804.

Monthly Electricity Costs

Average monthly electricity costs are another important consideration and one that makes residential wind turbines less feasible in Wyoming than the wind resource would predict. The more money spent on electricity, the more quickly on-site production of electricity will pay for itself. In Wyoming, electric-

ity prices are generally quite low and therefore often not worth the upfront cost of installing a small wind system. A good rule of thumb for this is if someone has a greater than \$150 per month average cost of electricity.

State, Federal Policies

State and federal policies are a consideration because they may decrease the upfront cost of the project and can dictate the availability of net metering. Federal and state governments have several grant programs, rebates, and other incentives to aide in installing renewable energy projects.

A listing of Wyoming-specific incentives can be found at the "Database of State Incentives for Renewables and Efficiency" at

<http://www.dsireusa.org/>. Net metering is a mandated policy in Wyoming. This means utilities are required to net meter their customers producing small amounts of renewable energies. Therefore, electric bills would reflect only the difference between what is used by the customer and what is produced. The specific terms of these agreements vary by utility and are on file with the Wyoming Public Service Commission.

Financing

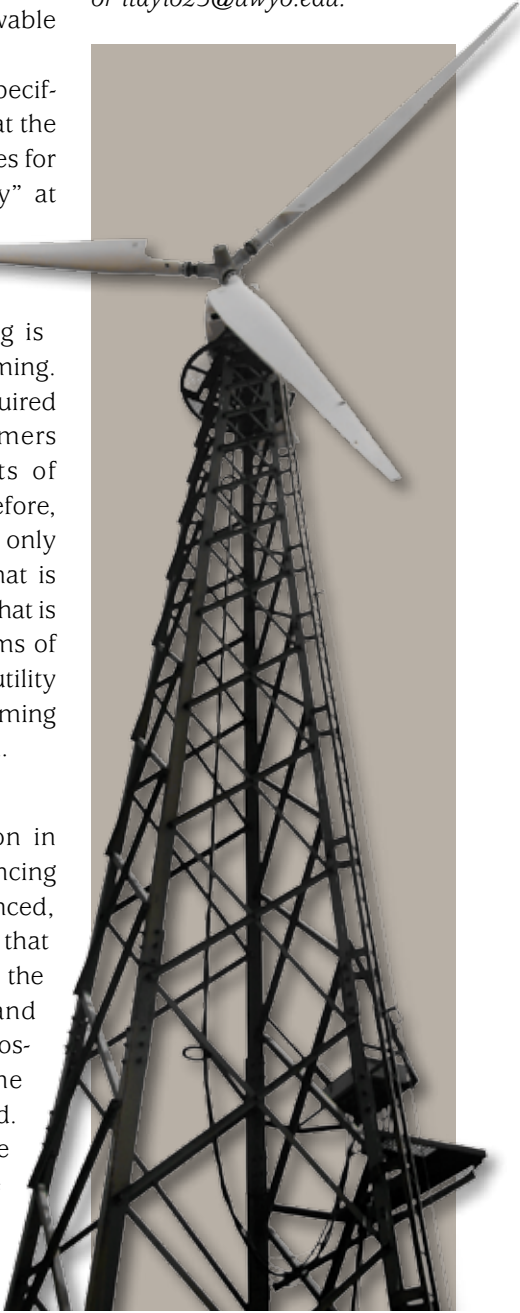
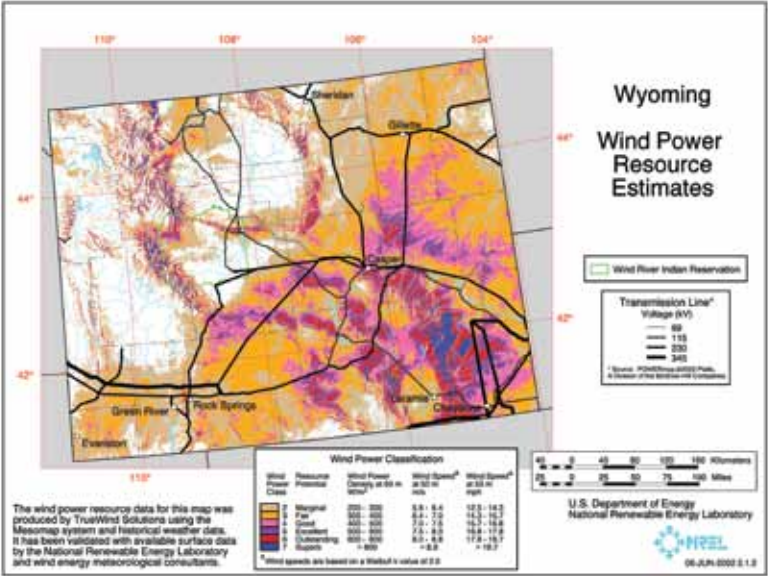
The final consideration in economic feasibility is financing options. If a turbine is financed, the interest will be a cost that needs to be considered in the payback period. Grants and cost-share programs are possible ways to decrease the amount of a project financed. Financing a wind turbine as a part of new home construction can greatly decrease the payback period but is not allowed

by all lenders.

All of these economic considerations will vary by situation but are factors in the feasibility of small wind use on the ranch or residence. There are several Web calculators available to help determine payback periods for these projects. The U.S. Department of Energy's Wind Powering America Web site has a free payback calculator program available on the "Small Wind Economic Model" link, which can be found at www.windpoweringamerica.gov/small_wind.asp.

Renewable energy use and development is a popular topic in news and government policy. Whether people are interested in it for economics, energy independence, environmental concerns, or other reasons, there are many benefits to considering renewable energy sources for ranch or residential use. In many cases, it may be worthwhile for landowners to at least consider utilizing the wind resource that just might be Wyoming's next source of energy generation.

Lindsay Taylor is a University of Wyoming Cooperative Extension Service area educator in northeast Wyoming. She can be reached at (307) 682-7281 or ltaylor25@uwyo.edu.





Can tall fescue be an important component in Wyoming pastures and hayfields?

By Anowar Islam

Grass pastures and hayfields are essential components of Western U.S. agriculture, especially on cattle ranches of the intermountain region of Wyoming and surrounding areas.

Unfortunately, the yield and quality of these grasslands are low and declining over time because of poor management practices (e.g. over or extended period of grazing, close or improper time of cutting), which has been further accelerated by soil degradation. As a consequence, the yield of these meadow grass pastures averages less than 1 ton per acre.

Attempts have been made to increase yields by fertilization and applying or controlling irrigation, but these efforts have resulted in little or no success. With ongoing fertilizer cost increases, improving these grasslands has become more difficult, creating a threat to producers' profitability and sustainability.

It has been suggested that, out of various management options for the improvement of high-altitude grasslands, at least four major options may be considered. These include establishment of improved plant species, proper fertilization, irrigation management, and appropriate timing of harvest. This indicates that introduction and establishment of improved novel pasture species, such as tall fescue, may have real potential in the improvement and sustainable production of pastures and hayfields.

Cool-season Perennial

Tall fescue (*Festuca arundinacea* Schreb.) is a cool-season perennial, bunch-type grass first introduced from Europe around 1850. Its importance, however, for forage and soil conservation was not well-understood until some improved cultivars, e.g. 'Alta' and 'Kentucky 31', were released in the 1940s. At present, tall fescue is considered one of the most productive cool-season grass species grown in the U.S. on an area of more than 35 million acres, feeding more than 8.5 million beef cows and 700,000 horses.

Tall fescue, generally referred to as an aggressive grass species, is well adapted to a wide range of soil and climatic conditions. For example, it tolerates pH ranging from highly acidic (4.5) to alkaline (9.5) and persists well in poorly drained soils. It has very good drought-



Cattle grazing tall fescue pastures

and cold-tolerance because of its deep-root and rhizome systems.

Although tall fescue dominates in the central and upper south of the U.S., it is also reported to be grown in Oregon, Washington, and, to some extent, in other Western states. In Utah, tall fescue was found to have superior forage yields compared to an array of cool-season grasses across an irrigation gradient.

Establishment of tall fescue is usually rated as slow to intermediate. However, recent studies showed well-managed clean-till practices result in rapid establishment, allowing 50-60 days of grazing in the first year of establishment. Anecdotal evidence from producers and researchers indicates tall fescue can be established with no-till broadcast depending on the climatic conditions.

Tall fescue can be planted into a firm, well-prepared seedbed in spring or late summer at a depth of 0.25 to 0.50 inch. Seeding rates vary depending on use. For example, 10-18 pounds/acre can be used when seeded alone or 5-9 lbs/acre when seeded in mixture with legumes such as alfalfa, red clover, and white clover.

Controlling Weeds

Weed management is always an issue in successful establishing of tall fescue. Spraying with glyphosate well before the seedbed preparation followed by a well-prepared seedbed and firm seed planting resulted in successful tall fescue establishment in the southern Great Plains. However, there is concern about controlling weeds in established tall fescue pastures. Herbicide options for management of multiple weeds during the grass establishment phase are limited. For example, Paramount (quinclorac) may be used effectively for control of field

bindweed when establishing tall fescue, but it will provide only suppression of Canada thistle or leafy spurge. Milestone (aminopyralid) provides excellent control of Canada thistle but no control of field bindweed or leafy spurge. Plateau (imazapic) provides excellent control of leafy spurge and has been used successfully for pasture renovations, but it will cause severe injury to tall fescue if applied during the establishment phase. If multiple perennial weed infestations are present in a pasture, herbicide options for establishment of tall fescue may not be inexpensive, as mixtures of several of the above herbicides would be required.

Tall fescue Performance

Tall fescue is highly responsive to added nitrogen. Also, tall fescue can be interseeded with alfalfa, red clover, and white clover or both red and white clovers. It has been reported tall fescue produced higher yields with red clover (11,100 lbs/acre) than with 180-lbs nitrogen/acre (9,900 lbs/acre).

Animal performance was also higher in a tall fescue-legume mixture than tall fescue-nitrogen pastures. For example, in a study in Alabama, average daily gain was about 1.5 times higher (1.53 lbs/day) in tall fescue with white clover pasture than tall fescue with 150-lb nitrogen/acre pasture (1.06 lbs/day).

In a three-year observation in northeastern Texas, one row of alfalfa for every two rows of tall fescue provided better persistence, yield, and quality compared to every other row of tall fescue and alfalfa or tall fescue pastures alone. These results suggest tall fescue established in pastures will have high potential to improve forage quality and animal performance provided pastures are properly

managed and/or fertilized with either inorganic fertilizers or mixed with legumes.

Multipurpose usages of tall fescue include pasture, hay, stockpiling, silage, soil conservation, and turf grass. Tall fescue can tolerate heavy, continuous grazing pressure; however, timing of grazing and hay-making affects the quality of the pasture. Too early or too closely grazing or cutting may help invasive undesirable species including weeds and grasses and will decrease the quality and yield of the forages.

Toxic Fungus

Fescue toxicosis, a physiological disorder of animals grazing tall fescue, may occur sometimes. A fungal endophyte (*Neotyphodium coenophialum*) living inside the plants produces ergot alkaloids that can be toxic to livestock. The severity of this problem is often enhanced by heat and humidity stress. However, this endophyte imparts stress tolerance to tall fescue with better persistence. Tall fescue with a novel endo-

phyte (i.e. an endophytic fungus producing no toxic compounds) does not cause toxicity to animals while providing improved plant persistence and better animal gains. Also, tall fescue planting in mixtures with legumes offsets the toxicity problem. Endophyte-free cultivars are available in the market, but they are less adapted and persistent, especially in the extreme environments, compared to endophyte-infected cultivars.

Information on establishment, persistence, growth, and performance of tall fescue, specifically of the newer varieties, in Wyoming and surrounding areas is limited, unfortunately. However, the good news is that recently a few trials on tall fescue novel varieties have been undertaken at the University of Wyoming's research and extension centers at Laramie and Lingle. Initial established plots for the first year look promising. One more project on seed and forage production of tall fescue will be established this spring at the Powell Research and Extension Center and also at a cooperator farm at Powell. Hopefully, more information will be gathered soon that will benefit not only the researchers but also producers across the state.

More information or answers to specific questions on tall fescue can be obtained by contacting the author.

Anowar Islam is an assistant professor and the University of Wyoming Cooperative Extension Service forage agroecologist in the Department of Plant Sciences in the College of Agriculture. He can be reached at (307) 766-4151 or mislam@uwyo.edu.



Tall fescue establishment at the University of Wyoming's James C. Hageman Sustainable Agriculture Research and Extension Center near Lingle



Rocky Mountain natives for Wyoming landscapes

By Donna Cuin

Each family of flowers has similar characteristics, and having a variety of flower shapes and forms increases the interest in the garden along with having a variety of colors and bloom times.

Considering the flower families along with their hardiness or suitability to our climate can add to the attractiveness and visual interest in the garden. Our Wyoming and Rocky Mountain habitats provide a wonderful array of environmental conditions that lend well to developing wildflower variations. We have high plains desert conditions, mountain foothills, and steppe areas as well as high mountain forest and mountain meadows. Plants adapt to their environment over eons and become suited to the various conditions in the many plant community niches of our varied environments statewide. These plant characteristic variations can be gathered and placed into our home landscape native plantings with little stress noticed by the plants.

Our habitats should not be disturbed by individual gardeners going out on plant collecting excursions in the wild. Professional horticulturists are already collecting seeds and specimens to propagate more plants for sale in the garden centers. If the garden center you frequent does not carry plants you are looking for, all they need to know is you are interested in purchasing plants to send them on a mission to find just the right source for their customers.

Aster Family

The Aster family is a very common group of plants in the Rocky Mountain west. These are flowers made up of many small flowers, and the family was at one time referred to as composite flowers. There are flowers around the edge of each "blossom" that look like what we typically think of as petals; these are the ray flowers that



Maximilian sunflower

radiate from the flower like rays of the sun.

Antennaria, or pussytoes, is a native to the Rocky Mountain region in the higher alpine areas and along windswept rocky foothills. This little plant is only about 4 inches tall when in bloom and makes a wonderful ground cover for sandy or rocky sites, works well in rock gardens, and is perfect for water wise or xeric gardens.

Berlandiera, commonly referred to as chocolate flower, is a wonderful, small wildflower that resembles black-eyed Susan, but the center is somewhat green instead of a dark brown or black. There is a species of *B. lyrata* that is a Plant Select® introduction. If you brush against the flowers, especially in the early morning hours, they emit a strong chocolate aroma.

Helianthus maximiliani, better known as the Maximilian sunflower, easily reaches 6-foot tall by the blooming season of late summer and early fall. It has distinct yellow sunflowers with dark brown centers; each bloom is about 4 inches in diameter with dozens of stems on these tall, showy plants.

Liatris is a flower I didn't remember as a wildflower and became aware of as a florist; they are long spikes of multiple

purple or lavender flowers. They are commonly called blazing stars, as the blooms begin to open at the top of the flower stem and continue to open all the way down the spike until each flower is open and in all its colorful glory.

Buttercup Family

The buttercup family includes several flowers very well-suited to cooler, shady locations in gardens. This group is made up of several regular-shaped flowers, including buttercups, anemones, and clematis. It also includes flowers with irregular shapes and having spurred flowers. One is our native delphinium, which is considered a weed on cattle rangeland because it is poisonous to cattle.

Aquilegia, commonly known as columbine, is available in quite an array of colors and sizes. The foliage is often an attractive soft and frilly addition to a garden when the flowers are not in show. Because this plant takes advantage of additional moisture in shady areas, it is a plant suited to droughty conditions, and there are two varieties recommended by Plant Select®.

Evening Primrose Family

Evening primrose family is made up of plants with flowers that have four petals or a combination of four petals. Some are held upright on the plant, and others hang down fuchsia, for example. These flowers are usually known for fragrance and attracting birds, bees, and butterflies to the garden because of their heavy nectar production. The flowers in this family range from simple white to extremely flashy; often more than one color blooms on one plant.

Epilobium (formerly *Zauchneria*) is commonly known as hummingbird trumpet because of its bright red flowers that have four petals joined together into a long tube. Hummingbirds are readily attracted to these flowers because of the bright red color and the heavy, fragrant nectar they produce. Plant Select® recommended Orange Carpet® hummingbird trumpet in 2001. This particular plant is native to the very western edge of Wyoming but well-suited to a variety of garden situations across the state.

Figwort Family

Figwort family members also form flowers with a tubular shape. These flowers usually attract bees instead of butterflies and may, depending on color, attract hummingbirds. The colors in this family range from

light yellow to blue, purple, and red. One of the other attractive features is the wide variations in foliage. Some have finely cut and frilly leaves and some have long narrow leaves, and still others have coarser wide blades.

Castilleja, which includes the Indian paintbrush, our state flower, is a favorite for native plant growers. This one can be difficult to start from seed and has been somewhat rare in the horticulture trade, but details are being worked out on methods for germinating seeds, and growers are becoming more and more successful at producing plants for garden centers. There are several colors in nature, but the most commonly available are the red flowering types.

Penstemon is readily becoming one of my favorite flowers in a native or xeric garden. The plants have a wide variety of foliage types and colors from white and light pink to bright fluorescent coral pink and bright purple. Depending upon flower size, I see a variety of bees visiting these flowers. Not only is there a variety of foliage types, but the plants vary from ground covers to almost 4 feet tall. Because of the wide range of locations these plants inhabit in native settings, there is probably a penstemon for every garden, except maybe very dense, moist shade.

Grass Family

Members of the grass family are plants every garden needs, but I am not referring to traditional turf grass. These are much larger plants and help the garden to mimic our native prairies and add much in the way of winter interest long after the blossoms of our flower gardens are gone and forgotten.

Achnatherum hymenoides, commonly known as Indian ricegrass, has been a favorite of mine all of my adult life. It is native to many habitats across the state and is seen at a wide variety of locations and elevations. It has a soft, lacy visual effect with almost silvery color in the late-day sunlight. It will attract deer and antelope for grazing but comes back easily even if grazed to the soil surface.

Schizachyrium scoparium, or little bluestem, is another must-have for any garden, especially if the gardener is trying to increase winter interest. This medium green-leaved grass turns a wonderful warm russet to orange color in fall and gives wonderful contrast to evergreen backgrounds or accents each new snowfall with the warm colorful glow.

Mint Family

Mint family members are most commonly known for a physical trait of the stems – they all have square-shaped stems. They also have another trait all members of the family have in common. They have five petals, or multiples of fives, joined into a tubular-shaped flower. This shape is one that attracts hummingbirds and butterflies and, if the flowers are the right sizes, will attract bees. One more common trait of members of this family is the aromatic foliage these plants exhibit. Each plant has its own fragrance, but they all have a pungent characteristic that comes through as a variation or "mint."

Agastache is most commonly called hyssop and has been grown in gardens throughout most of recorded history. This plant not only has fragrant flowers that attract hummingbirds, bees, and butterflies, but it also has fragrant, aromatic foliage that is one of its most pleasant features. This plant should be planted where the gardener regularly gets close enough to enjoy the fragrance. The flowers range from white to vivid hot pink and purple.

Monarda, known to most as beebalm, is another fragrant plant that attracts bees to the garden. This plant can take almost any location in the garden and make the most of it. I have grown it in full sun and on the north side of a building. It has inch-and-a-half to 2-inch clusters of flowers that resemble pom-poms at the end of each stem as they come into bloom and can have pink to lavender and even red blossoms.



Indian paintbrush



Beebalm



Additional Resources

There are several books out on xeric or water-wise gardening. The Denver Water Board was the first to coin the term xeriscape in the mid-1970's. They have three books out, all three from Fulcrum Ppublishing; *the Xeriscape Handbook*, *Xeriscape Plant Guide* and the *Xeriscape Color Guide*. There are many other authors and books on the subject and they all have good recommendations and suggestions of suitable plant material.

Many of these plants are Plant Select® recommendation or introductions. You can find more information about these and other plants well suited to Wyoming gardens at their Wweb site is plant-select.org. This year, Plant Select® published a book as a celebration of their 10th anniversary year. It is called *Durable Plants for the Garden* and is also distributed by Fulcrum Ppublishing. Native plants need supplemental water the first year or two as the roots establish; in nature, the seeds germinate in the season of the year when conditions are most suited to the needs of each specific plant. In the garden, we must help the plants by supplementing the water and creating an environment conducive to plant growth. Then, since these are native plants, they should be able to survive on the naturally occurring rainfall, but they will thrive with just a little more supplemental water each season after establishment.

Columbine

Phlox Family

The phlox family is made up of plants from ground cover size to almost 4 feet tall. The foliage has as much variation as the plant size. Some of the ground covers have long, narrow leaves that resemble, and are sometimes as sharp as, needles. The taller phlox have a more traditional shaped, softer leaf. The flowers in this group vary from white and pink to lavender, to purple and blue and some reds. They are often very small, one-half inch, in diameter and may form in small clusters or individually on the stem.

Ipomopsis aggregata (scarlet gilia) is another plant that will attract insects, bees, and butterflies as well as hummingbirds due to its bright-red, star-shaped blooms. The flowers are attached individually up the stalk and for a spike of color for the garden. This plant is not as readily available in garden centers but popularity is growing, and it can be found with a little detective work or searching. The best way

to encourage your local garden center to carry unusual plants you are interested in purchasing is to ask them to order the plant, and ask early in the season so they have a chance to get it from one of their suppliers or to get seed and have seedlings ready for sale when the season gets started. Another means of finding unusual plants like this one is to search online or in mail order catalogs for xeric plants.

As many of us are trying to develop or rejuvenate gardens more suited to our high plains desert and mountainous Wyoming conditions, considering native plants will become more and more prevalent. As gardeners request these plants, the horticulture trade will become more apt to grow and sell them to meet the needs of their clientele.

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How to estimate machinery costs

By John Hewlett

Machinery costs are one of the largest components of any agricultural enterprise requiring machinery inputs.

Higher fuel and labor prices only serve to make this component even more significant. Assembling accurate estimates of machinery and equipment costs can be an important part of any strategy to manage enterprise costs and reduce risk exposure.

How Much do Machinery Costs Matter?

Power units, non-powered equipment, and truck/vehicle costs represent a significant part of the total cost of any farm or ranch that relies on them. On a representative Big Horn Basin farm, machinery, equipment, and associated operator labor costs, totaled fully 30 percent of all farm costs. Machinery, equipment, and vehicle costs totaled 22 percent, while labor costs represented the remaining 8 percent (Powell Area Enterprise Budgets, 1995).

Component Costs

Machinery and equipment costs may be broken into two categories: fixed or ownership costs and variable or operating costs. Fixed costs include items such as depreciation, long-term interest, taxes, housing, and insurance costs. These costs do not generally change with the level of production. That is, they must be paid whether or not a single acre is planted in a given crop year.

Fixed costs may be cash costs. That is, they are paid annually by cash or check. Examples include property taxes and insurance costs on machinery and equipment. Other costs are non-cash costs but are important to accurately estimate total enterprise costs. Examples of these include depreciation and housing costs. Depreciation (other than tax depreciation) is a method of allocating the initial purchase price of a machine over its useful life. As such, no cash is paid each year for the use of the machine.

Variable costs are machinery and equipment costs, which vary with the level of machine use. That is, the more hours the machine is operated, the higher these costs become. Variable costs typically include fuel and lubrication, repair and maintenance, and operator labor costs. These are usually cash costs paid each year the machine is operated.

For the representative Big Horn Basin farm, fixed costs for machinery and equipment totaled 42 percent of all fixed costs for the farm. In addition, variable costs for the machinery were 12 percent, and operator labor was 12 percent of total variable costs. Together, machinery and equipment and operator labor costs represented 24 percent of all farm variable costs.

Estimating Machinery Costs

Many land-grant universities make available bulletins and software describing techniques for accurately estimating machinery and equipment costs. The University of Wyoming Department of Agricultural and Applied Economics in the College of Agriculture also makes such tools available. The "Wyoming Machinery Cost Calculation Program" is an easy-to-use software program for estimating the cost of powered machines, non-powered equipment, vehicles, and both powered and non-powered irrigation equipment. Output provides the user with estimates of the various fixed and variable cost items outlined above using standard formulas developed by agricultural economists and agricultural engineers, based on significant field experience.

For More Information

To access the UW *Wyoming Machinery and Operation Costs* bulletin or Wyoming Machinery Cost Calculation Software, point your Internet browser to <http://agecon.uwyo.edu/Farm-Mgt/PUBS/MACHBULS.HTM>.

For more information on the topics covered here or other risk management topics on the Web, visit the Western Risk Management Library at agecon.uwyo.edu/riskmgt.

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PRF Vegetation Index Insurance: Risk protection for

By James Sedman and John Hewlett

Wyoming and other Western livestock producers have a new tool available to help manage production risk through the U.S. Department of Agriculture's Risk Management Agency (RMA) crop insurance program.

The Pasture Rangeland and Forage Vegetation Index (PRF-VI) insurance product was introduced as a pilot program in 2007 and expanded in 2008. PRF-VI replaced the group insurance policy rangeland (GRP-Rangeland or Net-Hay Index) for 2009. It combines the advantages of an individual policy while retaining the cost-saving nature of a group policy.

What is PRF-VI and How Does it Work?

The PRF-VI program is a group risk policy covering hay, forages, and grazing land. PRF-VI uses normalized-difference, vegetation index data from the U.S. Geological Survey. This data is collected from satellite and other imagery of the vegetative greenness of an area and determines the basis for insurance coverage: it is a measure of vegetation greenness and correlates to forage condition and productive capacity in approximately 4.8 by 4.8 mile (or 23-square mile) grids. Losses occur when the actual vegetative data deviates significantly from the normalized index data for the selected grid area.

Rangeland and forage used for pasture as well as hay may be covered under this policy;

however, no annually planted forage coverage is available under this program. Producers select some or all of a desired acreage within a grid area then choose one of four, three-month periods for coverage. Total coverage provided is determined by the selected coverage level (70 to 90 percent) and the selected productivity factor (60 to 150 percent). Per-acre premiums are determined by these factors and the specific grid point for insurance. As with any insurance, higher levels of coverage result in a higher premium.

Advantages of PRF-VI

PRF-VI has several advantages for producers, especially when compared with the previously available GRP-Rangeland product and the Non-insured Crop Disaster Assistance Program (NAP) coverage. A PRF-VI policy is more localized in its coverage area, whereas the previous GRP-Rangeland program was based on dry land hay yields for an entire county. For example, if one half of a county experienced normal rainfall for a year, under GRP-Rangeland the county average hay yield may not have reflected individual losses in production, especially in the half of the county with lower than average rainfall. PRF-VI is much more area specific.

PRF-VI also provides coverage for hay ground whereas GRP-Rangeland did not. This provides even further protection in the event of a loss. PRF-VI also

allows for a choice of the most critical time frame (three-month period) to insure. For example, if a particular area is more prone to drought in the late spring (April through June), then this specialized coverage would be extremely useful in protecting against a loss.

PRF-VI insurance generally provides a higher level of protection per acre than NAP coverage. In addition, the program qualifies a producer for any federal disaster assistance that may become available. Of course, this higher level of coverage comes at a higher premium cost per-acre covered.

See How PRF-VI Would Work For Your Operation

One of the innovations of PRF-VI insurance is the RMA Web site tools to help determine the best coverage fit for an individual operation. At the RMA main page (www.rma.usda.gov), select Crop Policies from Browse by Subject on the left side of the page. Then scroll to select Vegetation Index (VI). Then select Pasture, Rangeland, Forage (PRF). Select the Grid ID Locator's Interactive Map link or Latitude/Longitude Lookup link to determine what grid point(s) an operation might include. If you know your latitude and longitude, enter it directly. Otherwise, use the city locator to find the city closest to your point, and navigate the map from there. Once the grid point is identified, select the Decision Support Tool link on the lower left side of the

page. This links to an interactive worksheet estimating how PRF-VI would have worked if used on the specific grid point for one or more of the past 19 years. By entering the desired productivity and coverage level, the worksheet can help producers decide which premium and coverage level is the best fit.

As an example, consider a ranch in southeast Wyoming at the grid point 78852 (Goshen County). This ranch has 1,200 acres of hay and pasture land to insure. There are 1,100 acres of rangeland the owner wishes to insure for period I (April through June) and 100 acres of hay. By entering this information into the online worksheet, along with a 90-percent coverage level and a 90-percent productivity factor, the resulting coverage per acre for the past year is \$6 per acre, with a premium of 23 cents per acre. By adjusting the productivity factor up to the maximum of 150 percent, coverage increases to \$11 per acre with a \$0.53 per-acre premium.

Historical Data in Risk Management Planning

First and foremost, remember the purpose of utilizing any crop insurance policy is to provide the most cost-effective coverage of production risk – not to maximize expected benefits.

Any risk management plan should be included as part of a producer's overall planning and budget. Determine first what risks should be covered and the

amount of coverage necessary to insure an acceptable revenue stream. In the case of PRF-VI insurance, whether for hay or pasture, a producer can use the historical data and premium/loss calculators online to see how this policy might have performed for a chosen grid area over past years. Results provide estimates of premium costs, coverage, and indemnity payments in both good and bad production years. These may be used as a guide to decision-making for coming production seasons.

For example, if 2004 was representative of a severe drought in an area, then using the insurance data from that year to plan for the event of a severe loss may be a good choice. Users may also see how changing the combinations of coverage and productivity factors affect the premium cost and total coverage. This data is only for illustrative purposes; however, it can provide a reasonable picture for planning purposes. A local crop insurance agent should be the final source of premium and coverage information when purchasing a policy.

Southeast Wyoming Ranch Example

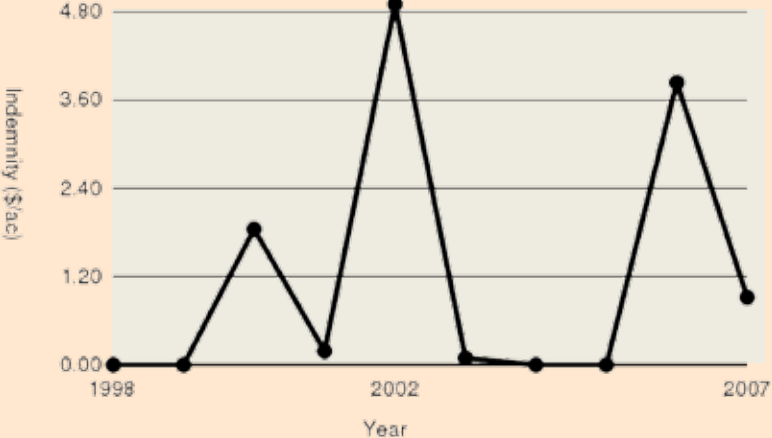
To illustrate the differences in coverage possible with a PRF-VI insurance policy, consider the previous southeast Wyoming ranch. The ranch has 1,200 insurable acres in grid 78852: 1,100 of pasture and 100 acres of hay. The ranch is most interested



Table One. Example Ranch Per-Acre Coverage Levels (2002. Period II)

Coverage Level	Productivity Factor	Premium Cost	Total Coverage	Indemnity Value	Cost Per \$ of Coverage
70%	70%	0.10	4.00	2.46	\$0.025
70%	100%	0.15	6.00	3.69	\$0.025
70%	150%	0.19	8.00	4.91	\$0.024
80%	70%	0.14	4.00	2.65	\$0.035
80%	100%	0.21	6.00	3.97	\$0.035
80%	150%	0.36	10.00	6.62	\$0.036
90%	70%	0.25	5.00	3.50	\$0.050
90%	100%	0.36	7.00	4.90	\$0.051
90%	150%	0.56	11.00	7.70	\$0.051

Figure 1. Estimated Indemnities for Example Southeast Wyoming Ranch



pasture and forages

in insuring its 1,100 acres of summer grass for period II (July through September), especially in view of past droughts. The year 2002 was a severe drought year for this ranch and will be our example year. Entering the grid-point and county information provides the county base value of \$7.96 per acre. Entering a productivity factor of 100 percent and a 90-percent coverage level results in total coverage of \$7 per acre, an indemnity per acre of \$4 and producer premium of \$0.36 per acre. The effects of changing the productivity factor and coverage level are shown in Table 1. While this information is not indicative of future coverage, it gives an accurate picture of how this ranch might be protected in the case of a drought.

Where the ranch goal is to maximize coverage with a premium on the low side, then a lower coverage level coupled with a productivity factor of 100 percent or higher should be selected. If premium cost is not an obstacle, then both high coverage and productivity percentages should be selected.

The ranch may also view historical data available on the site to better estimate the likelihood of a loss. Using the graph function (90-percent coverage and 150-percent productivity factor) generates a chart showing the estimated indemnities from years 1998 through 2007. The chart in Figure 1, from the PRF-

VI Web site, shows that, for three of the nine years displayed, an indemnity of more than \$1/acre would have been paid. Knowing this, the operator must decide if this is an acceptable level of coverage for the cost incurred. Remember, the goal of any risk management strategy should be to provide the most effective protection and not to maximize the likelihood of a payout in the form of an indemnity.

For More Information

While PRF-VI insurance may require more decisions than the previous GRP-Rangeland product, users will find it provides more extensive coverage and can be better tailored to suit individual risk management needs.

For more information on these policies, visit a local crop insurance agent or the RMA Web site at www.rma.usda.gov. Follow the links listed above to use the interactive PRF-VI online tools. For more information on this and other risk management topics on the Web, visit the Western Risk Management Library at agecon.uwyo.edu/riskmgt.

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Grazing multi-species can rid undesirable plants, make pastures more productive

By Kellie Chichester

With interest sparking in an old practice – multi-species grazing – some ranchers in Wyoming and the West are looking at adding sheep or goats to their grazing plan.

The competition for grass in the West between cattle and sheep grazers is becoming a thing of the past as research has shown multi-species grazing can increase the efficiency of forage harvest leading to increased production.

As with any grazing plan, keep timing and intensity in mind. Sheep prefer forbs, and goats prefer browsing on brush, shrubs, and broad-leaved weeds; therefore, grazing multi-species together can decrease undesirable plants while increase the desirable plants and boost the pounds of animal gain per acre. By removing broadleaf plants, the grasses are able to thrive.



space would become available for desirables.

Leafy spurge should be grazed in the spring to remove the flowering parts of the plant. Grazing may be required in the late summer to eliminate the regrowth of the plants. This type of grazing will help eliminate the seed set possibility. Intensive grazing will work as well to control the weed by stressing the energy reserves of the plant, forcing it to regrow multiple times in a year.

A potential problem that may occur is first introducing cattle and sheep together. After a couple of days, the animals should settle and all become comfortable in the same pasture.

Fencing, Predator Considerations

Fencing differences also need to be considered. Electric fencing used for cattle may not be substantial enough for sheep and goats. If you do use electric fence with only one string of wire, consider adding at least one more wire. If another wire can't be added, an option may be to offset wires inside the fence. If you have questions about installing fence, contact your local extension educator or visit <http://barnyardstobackyards.com/Articles/portable%20fencing%20spring%202006.pdf> for information.

Predators are very often a problem. When adding sheep and/or goats to your grazing plan, you may need to be more observant of predators. Live-stock guardian animals may need to be considered. During lambing, the species may need to be separated or a creep fence set up so ewes can go into a more protected area. Sheep will

bond to cattle when introduced at a young age, decreasing the incidences of predator attacks.

If water sources have been established and large, deep-sided water troughs are being used, care needs to be taken so the sheep and young lambs can reach the water. Modifications may need to be made to accommodate differences in size. Also, when administering a mineral program, keep in mind not all cattle mixes may be suitable for sheep and vice versa.

Not only can sheep add value to your pastures, they can also add flavor to your dinner table. In 2008, Wyoming ranked third nationally for total numbers of sheep and lambs with 440,000 head.

To remain sustainable, multi-species grazing may be something to consider, getting the most bang out of your pastures.

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Knowing what predator killed your stock — fast response is critical

By Ron Cunningham

Predator losses continue to pose a financial and emotional burden to the livestock industry and many times occur without compensation.

But to some, it is a shock coyotes, wolves, bears, mountain lions, foxes, eagles, domestic and feral dogs, and ravens kill sheep/lambs, goats, cattle, calves, and even horses.

For those livestock producers fortunate to receive partial reimbursement of predator losses, such as from wolves or bears, let's identify which predators caused the loss, how the predators attack livestock, and how they each kill in different ways.

It is critically important to immediately determine what kind of predator killed the livestock. Federal and/or state experts should be at the scene as soon as possible if the kill was made by a bear or wolf, plus, quick action is needed to preserve the area to identify the predator.

If you find an animal you believe has been killed by a predator, be very observant and careful approaching the dead animal. Some large predators may still be in the area, and you will want to preserve all evidence to help determine what predator killed the animal. Be careful to protect all tracks on the ground, protect all hair, scat, blood spots or blood trail evidence, and look for the rumen or other internal parts that may be scattered about the kill area.

Coyotes

Coyotes normally kill livestock — primarily sheep or young calves — with a bite to the throat or by attaching to the lower jaw and pulling them down. Many times, coyotes will leave no outward signs of an attack like pulling of the wool or excessive biting. To determine a coyote attack, you will need to skin the hide back at the point of attack and check for edema, or bleeding under the hide, as coyotes leave very few clues on



the outside. A typical coyote kill will have edema in the region of the throat. As you skin the area, check for the canine puncture wounds in the flesh and the spacing of the canines. A coyote may drag its prey as it eats, but the drag marks will be short and appear jerky in various directions.

Wolves

Wolves usually try to damage the muscles and ligaments in the back legs or by grabbing the flank and dragging an animal down. Wolves may attack on the webbing of the front shoulders and sometimes will bite the throat or the nose. Many times, wolves leave massive trauma in several areas of their prey. Some wolves have been known to start eating a calf on its rear before it is dead.

Bears

Bears will normally kill by biting the neck or by biting the vertebrae just behind the front shoulder. A bear then may eat the udder of females, heart, and liver, and the animal may be partially or completely skinned. Bears will usually scatter the intestines, rumen, hide, and bones. Bears many times will skin the hide of a leg leaving the very lower part of the skin still attached and the upper part pulled inside out. If a bear attacks in an open area, it many times will drag its prey to a secluded area. Bears sometimes hide their caches and cover them with debris and dirt.

Mountain Lion

Mountain lions kill with bites from above breaking the neck or even crushing the skull. Mountain lions many times start eating on the front quarters and neck but generally never eat the stomach or rumen. A lion may also drag its victim and try to cover it with brush and litter. As it returns to feed again, it may also drag the victim to another location with each feeding and then cover it as it leaves again. They may leave signs they have dragged their prey from the kill site.

Dogs

Domestic and feral dogs typically attack the hind quarters, flanks, and/or the head and ears of livestock. A typical dog attack will show many bite marks, shredded ears, and lots of torn hide and/or wool pulling. Dogs may wound or kill an animal but rarely consume their prey.

Eagles

Eagles leave very distinct puncture marks, and they may even feed on a prey's brain after killing it. Talon puncture wounds will be on the back and along the vertebrae and/or on the neck and head.

Contacting the appropriate agencies is critical (see story below).

Immediately preserve the evidence by protecting the carcass from secondary or additional predators or scavengers. This may require covering the animal(s) with a tarp and staying close until experts arrive to document which predator killed the animal(s). Remember, protecting the evidence even from onlookers, livestock, or guard dogs is important.

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Cascading marketing values in the beef industry

By Hudson Hill

The world we live in has become more and more complicated as has the way we market and sell beef in America.

Today's consumers are asking for more options to fill their needs, and beef suppliers and retailers have been attempting to meet those changing needs.

What this means for the producer is that, as the wants and needs of consumers change, opportunities for premiums in the market also change. Hence, opportunities for producers to capture value have increased and producers have many more options for marketing their cattle than they had just a few years ago.

Bovine spongiform encephalitis (BSE) was found in this country in December 2003. Within a week, the Asian market closed American exported beef products into their countries. Since then, multiple organizations are working hard to open doors and get that market back.

As a first step to regain Asian markets, beef exporters were required to meet the 24-month rule: no beef products could be exported to countries like Japan that originated from animals older than 24 months of age. This new rule created a need to be able to find and verify cattle that fit that requirement.

So as source and age verified cattle go to the Asian market, process verified programs (PVP) were born. PVP programs provide an independent third-party guarantee for consumers by establishing a set of standard operating procedures with producers. While the Asian market has acted as the catalyst for PVP programs, domestic consumers have also demonstrated a willingness to pay a premium for branded products that have similar third-party guarantees. While PVP programs may be more complicated than past marketing tools, there are opportunities for beef producers to qualify for premiums attached to the individual programs.

Many consumers want products that can be labeled or branded and fit their ideals. The

third-party verification offered by PVP programs is accomplishing this by reassuring retailers and consumers of the traits associated with specific products.

Here are some of the verifiable programs available to producers: vaccination history, source and age verified, persistent infection free, humanely treated, non-hormone treated calf (NHTC), natural, and organic. Each one of the processes, if verified, can add value to a calf creating a cascading set of values within the beef marketing system. More information and programs can be found at www.usverified.com.

When the Asian market opened again allowing 24-month age verified beef, U.S. producers were rewarded with stronger prices. Currently, the U.S. is negotiating to increase the age limit to 30 months. If successful, many more cattle will be eligible for export to the Asian market. Additionally, with an increase in export demand, producers will once again be rewarded with stronger prices. Individual producers with cattle source and age verified to qualify for that export market stand to be rewarded with additional premiums.

PVPs are not just a fad in the cattle industry but are creating a cascading effect on the worth of an animal. These programs are growing, and each tier within the system has the ability to add value; however, alignment within the industry is important with the big key to success being credible and accurate information.

So the question producers need to answer is "Where can I fit in?" It's imperative producers find a way to market cattle with as much added value as they can to fit within their own business plan and ability to produce. If done correctly with verifiable records, they should find their efforts well paid for in premiums.

Hudson Hill is a University of Wyoming Cooperative Extension Service educator serving Lincoln, Sublette, Sweetwater, Teton, and Uinta counties. He can be reached at (307) 885-3132 or hrhill@uwyo.edu.

Who to contact

Immediately calling your county trapper or the U.S. Department of Agriculture's Animal and Plant Health Inspection Service's (USDA APHIS) Wyoming Wildlife Services person is critical so they can help determine what killed the livestock and, hopefully, help with control efforts.

If the local trapper or local USDA APHIS person cannot be reached, contact:

- U.S. Department of Agriculture's Animal and Plant Health Inspection Service's Wyoming Wildlife Services — (307) 261-5336 or online at www.aphis.usda.gov/wildlife_damage/state_office/wyoming_info.shtml.
- Wyoming Animal Damage Management Board — The board was established to mitigate damage caused to livestock, wildlife, and crops by predatory animals, predacious birds and depredating animals or for the protection of human health and safety. — (307) 777-6433 or www.wyadmb.com/index.htm.



Battling Wyoming's hot, cold, wet – be prepared out there

By Josie Davies

From below zero temperatures to scorching hot days, Wyoming's ranchers and farmers are exposed to dangerous temperatures that can lead to serious illnesses.

It is important for those spending excessive amounts of time outside to know the dangers and precautions to take when faced with these conditions.

With a mean elevation of 6,700 feet above sea level, Wyoming generally has relatively cool temperatures, but it is also known for its extremes.

Wyoming's latitude, altitude, and topography can create harsh conditions. January is typically the coldest month, often having temperatures of 5 to 10 degrees F and below. Wyoming is also quite windy. During the winter months, it's not uncommon for winds to reach 30 to 40 miles per hour. Even when winter temperatures are balmy, winds can create dangerous situations. For example, when the air temperature is 40 degrees F and the wind is 35 mph, exposed skin perceives the air temperature as 28 degrees, which is known as the wind chill factor.

Turning to summer, it's not uncommon for temperatures to reach 90 and 100 degrees in some areas of the state.

In these harsh conditions, Wyoming ranchers and farmers need to take extra precautions.

Cold Weather

In the winter months, ranchers and farmers can face severe and changing weather. Even weather that is not freezing can affect the body. The problem with cold weather is the body, when not protected with proper clothing and fluid intake, loses heat faster than it can be replaced. The wind also can remove body heat.

According to National Ag Safety Database, the most common physical conditions caused by cold weather include hypothermia (lowered body temperature) and frostbite.

Hypothermia can be very dangerous because most people do not realize they are experiencing the symptoms until it is too late. Physical signs of hypothermia are fumbling hands, exhaustion, shivering, and drowsiness; however, hypothermia also affects victims mentally causing memory loss, slurred speech, and confusion. The loss of shivering reflex is an ominous sign of advanced hypothermia.

Commonly, hypothermia occurs in cold weather but can

still happen due to sweat, rain, or immersion of cold water, which can cause the body to become chilled.

To treat hypothermia, find shelter in a warm room or an area out of the wind, such as a tent, sleeping bag, or vehicle. Gradually warm the person. Avoid immersing the person, especially if elderly or not in good overall health, in warm or hot water as the sudden temperature



change can stop the heart. Next, remove wet clothing, and, if possible, replace with dry clothing. A coat, hat, blanket, and sleeping bag can also be used to warm the patient. It is often helpful if a person who is warm lies next to the person who has hypothermia.

You can also place warm water bottles or a heated blanket around the victim. As soon as possible get the victim to the nearest emergency room facility for internal warming as the victim often cannot generate his or her own body heat.

Frostbite Dangers

Frostbite is another common cold weather illness that can cause permanent damage to the affected body parts. Skin and tissues can actually freeze when exposed to very cold temperatures. This occurs when blood vessels in the extremities start to constrict to help preserve the core body temperature. This can cause loss of feeling and color in extremities such as the nose, ears, toes, fingers, chin, and cheeks.

Give warm liquids to drink if the victim does not have problems swallowing, but DO NOT give the hypothermic victim alcohol as this will worsen the condition.

The first sign of frostbite is redness and pain in the affected area. Other symptoms include numbness, white or grayish-yellow skin, and waxy skin. Depending on severity, frostbite may lead to amputation.

The first step in treatment is to shelter the victim from the cold, preferably moving him or her to a warm place. Remove wet clothing and any constrictive items such as jewelry. Wrap affected areas in sterile dressings, and immediately seek emergency help.

If immediate emergency help is not available, slowly warm the affected areas by repeatedly applying warm clothes, or soak the affected areas in lukewarm water (never HOT!). The temperature should be about 102 to 108 degrees, and the water should be changed often.

Do not rub the affected area, and NEVER rewarm these areas

if there is a chance they may freeze again as this causes additional damage. If possible, give the person warm, nonalcoholic and non-caffeinated drinks. Seek medical help as soon as possible.

Another cold weather condition is chilblains. Chilblains are a painful inflammation of small blood vessels in the skin responding to sudden warming from cold temperatures. Chilblains can cause itching, red patches, swelling, and blistering on the extremities, such as ears, fingers, or toes, according to the Maine Farm Safety Program. Chilblains usually respond well to treatment and clears up within 14 days. Treatment typically consists of lotions and medications. While it doesn't usually result in permanent injury, chilblains can lead to severe damage if left untreated.

Be Prepared

To prevent cold weather related illnesses, prepare and follow guidelines. When working outside, limit the amount of exposure on extremely cold days. Always be prepared. Have a cold weather pack on hand containing a dry change of clothes including socks, gloves, warm hats, a coat, and blankets. Also have a thermos of hot liquid, and eat high-energy foods.

When going outside, dress in layers of clothing based on the temperature, wind, and moisture, and have additional layers on hand.

For the outer layer, wear materials that break the wind and are either waterproof or water resistant but allow body moisture to escape.

The middle layer or layers can consist of wool, goose or duck down, and synthetic materials. Down is a great insulator

when it's dry, but it loses all of its insulating values when wet. Wool and synthetic materials such as polyester still retain insulating properties when wet.

The base layer should wick perspiration from the body to keep your skin dry. Synthetic materials, such as polypropylene, are a good choice, whereas wool and silk are the best natural fibers. Cotton is a poor choice because it absorbs water and holds that water next to your skin, which can quickly lead to hypothermia. Avoid tight clothing that blocks blood circulation. Protect all parts of your body including ears, head, hands, and feet.

Hot Weather

Symptoms of heat-related illness can be subtle at first; however, they can turn into life-threatening conditions. Illnesses from extended exposure to hot temperatures include heat stroke and exhaustion, dehydration, and heat cramps.

Heat stroke is a serious condition that can be fatal. Symptoms include nausea, vomiting, fatigue, headaches, dizziness, muscle cramps, and weakness. Victims tend to get red, hot, dry skin and a weak pulse. To treat heat stroke, cool the victim down. Find a shady location, and place a cool, wet cloth over his or her forehead or slowly pour cool (not cold) water on the victim. Fanning the victim also helps. Get medical help immediately.

To prevent heat stroke, it is important to keep hydrated by drinking plenty of liquids such as water or a sports drink. Sports drinks help replace electrolytes including salt and potassium. Avoid alcohol and caffeinated drinks, and also avoid vigorous physical activity in extreme hot weather.

A milder form of a heat-related illness is heat exhaustion. This can develop after several days of exposure to high temperatures and not replenishing liquids. Symptoms include paleness, heavy sweating, cramps, tiredness, weakness, dizziness, fainting, and vomiting. In these

cases, give the victim liquids, and cool them down.

Heat cramps are the least severe; however, it is a signal your body is reacting poorly to the heat. To treat cramps, first loosen clothing, find a cool area, and get the patient water.

When hot temperatures arrive, gradually accustom your body to the temperature. Each day, gradually spend more time outside, and try to work during the cooler periods of the day. Drink plenty of liquids. Water and sports drinks are recommended. Avoid alcohol and caffeinated drinks.

Protect your skin from the sun by wearing long-sleeved shirts and a broad-brimmed hat. Wear sunscreen to avoid sunburns and possible skin cancer. It is recommended to wear at least a sun protection factor (SPF) of at least 15 or more. It is important to wear sunglasses that protect against ultraviolet light.

When working outside, prepare yourself for both cold and hot temperatures to avoid illnesses.

For all public health hazards, contact the Wyoming Department of Health all-hazards response hotline at (888) 996-9104.

If you would like more information on safety on the ranch or farm, contact Wyoming AgrAbility. It strives to help individuals increase their ability to perform current or new work tasks, inform consumers on secondary injury prevention, and increase independence at home and in the community.

If you would like an AgrAbility staff member to visit your operation or know of someone who could benefit from this program, call toll-free (866) 395-4986, e-mail AgrAbility@uwyo.edu, or go to the AgrAbility Web site at www.uwyo.edu/agrability.

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Raising small fruits in Wyoming ... ‘berry’ delicious!

By Karen Panter

Growing raspberries, strawberries, gooseberries, currants, grapes, and other small fruits can be interesting, challenging, and rewarding. Success depends on selecting the proper site and providing proper soil conditions and care to allow plants to flourish. Many can be grown in Wyoming commercially.

Most, but not all, small fruits grow and produce best in full sun. Avoid planting in areas near trees or large shrubs that compete for moisture and nutrients. Take advantage of sunny areas, and use locations protected from drying winds. Also avoid planting small fruits in areas where potatoes, tomatoes, peppers, eggplants, or other berries have grown within the past three years. These plants can harbor soil-borne diseases that might affect the new planting.

Growers should plan for long-term production. Strawberry plants, properly cared for, remain productive for three to five years. Raspberries often produce a good crop for 15 to 20 years. Grapes can survive for 40 to 100 years.

Raspberries

Raspberries are available in many varieties, whether red, black, gold, or purple. All are in the genus *Rubus*, and all have similar fruiting habits. Red raspberries come in either summer or fall fruit-bearing varieties. For a high volume of fruit and best freezing quality, grow a summer-bearing type. Grow a fall bearer for one crop in late summer, and use the fruit mainly for fresh eating.

Strawberries

Strawberry types (genus *Fragaria*) include June bearers, ever bearers, and day neutrals. June-bearing varieties produce only one crop per year in June/July. Everbearing strawberries produce two crops, one in June/early July and another in the fall.

Low Temperature Ranges for Cold Hardiness Zones 3, 4, 5

(Fahrenheit)

- **Zone 3**
-40 to -30
- **Zone 4**
-30 to -20
- **Zone 5**
-20 to -10

Day neutrals produce almost continuously throughout the growing season.

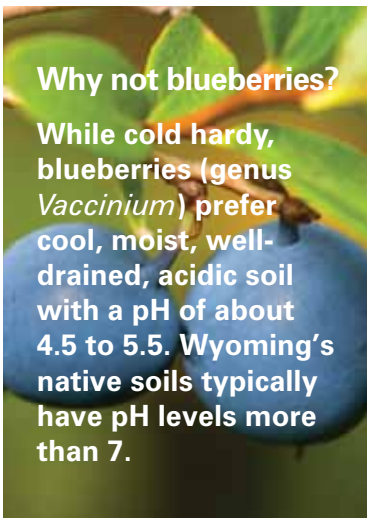
The fruit of ever bearers and day neutrals is smaller than that of June bearers, and total yields are often lower; however, the advantage of growing these types along with June bearers is that one can harvest fruit for most of the growing season. Note that day neutrals are the best choice for fresh fruit throughout the season because they have a longer fruiting period and better fruit quality. Unfortunately, retail nurseries often lump day neutrals and ever bearers together as “ever bearers.”

Currants and Gooseberries

Currants and gooseberries are closely related perennial bush fruits, both belonging to the genus *Ribes*. Their relatively small plant size, ease of culture, and distinctive, attractive fruit make them well suited for home gardens and commercial plantings. Gooseberries and currants are very hardy and can be grown in most areas of Wyoming.

Black currants are prized for their distinctive flavor in juices, jellies, and liqueurs. They are also rich in vitamin C. Red currants are used mainly for fresh eating or jelly.

Gooseberries can have red-purple or green-yellow fruit and are eaten fresh or made into



jams, pies, and other desserts. Both currants and gooseberries can be frozen easily and kept for later use.

Gooseberries and currants do best in partially shaded locations or on north or northeast-facing slopes, where there is less likelihood of leaf and fruit scalding. Red currants and gooseberries generally are self-fruitful, so only one cultivar is needed for fruit production; however, both types produce larger fruit if more than one cultivar is planted, for cross-pollination. Some black currants are self-sterile and require a second cultivar for fruit production.

Grapes

Because grapes are self-fertile, only one cultivar is needed for fruit production; however, one may prefer growing several for variety. Cultivars differ in their suitability for eating fresh or as juice, wine, raisin, and jelly. Choose a cultivar that will mature in a particular area. Three types of grapes are grown in the United States, and each has specific qualities.

American cultivars (*Vitis labrusca*) have a strong musty flavor and aroma. These cultivars are used mostly for juice and fresh eating. European cultivars (*Vitis vinifera*) differ from American cultivars in fruit characteristics, vine growth habit, and climate adaptation. They have tight clusters, generally thin skins, and a wine-like flavor. They require more warm days for fruit maturation than do American types. French-American hybrids have some characteristics of both American and European types, depending on parentage.

Elderberries

There are many species of elderberries native to North America. The commercially grown species is *Sambucus canadensis*. The fruit can be used for juice, sauces, jellies, and wine. Elderberries sold through nurseries are often not distinguished by a cultivar

name. Although elderberries are partially self-fruitful, they will benefit from cross-pollination. Elderberries prefer full sun and grow in a wide range of soil types, from very wet to dry. Plants may grow to a height of 12 feet.

Saskatoon Berries

Saskatoons (*Amelanchier alnifolia*) are also known as juneberries, serviceberries, servisberries, and mountain blueberries. This species is native to North America. The plants are great ornamentals with attractive blossoms and good fall color. Fruit may be eaten fresh or used in pies, wines, jellies, jams, and syrups.

Detailed cultural guidelines can be found in the University of Wyoming Cooperative Extension Service (UW CES) manual *Sustainable Horticulture for Wyoming*, available for \$30 through the UW CES Resource Center at http://uwadmnweb.uwyo.edu/UWAG/Resource_Center.asp by clicking the Search button and typing the title in the Publication Title field, by e-mailing CESpubs@uwyo.edu, or by calling (307) 766-2115.

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Recommended small fruit varieties for Wyoming

(U.S. Department of Agriculture Cold Hardiness Zones in parentheses)

Raspberries

- Red summer bearing: Boyne (3), Canby (3), Latham (4), Liberty (3), Nordic (4)
- Red fall bearing: Amity (3), Autumn Bliss (4), Heritage (4), Redwing (4), September (3)
- Yellow fall bearing: Fallgold (4)
- Black: Bristol (4), Cumberland (4), Black Hawk (4)
- Purple: Royalty (4)

Strawberries

- June bearers: Dunlap (3), Guardian (3), Honeoye (3), Redcoat (3), Surecrop (3), Trumpeter (3)
- Everbearers: Fort Laramie (3), Ogallala (3), Ozark Beauty (3), Quinault (3)
- Day neutrals: Tristar (4-5), Tribute (4-5)

Currants

- Black: Consort (3), Crusader (3)
- Red: Wilder (4), Red Lake (4), Hinnomaki Red (4)
- Gooseberries: Pixwell (3), Captivator (3)
- Gooseberry x black currant hybrid: Jostaberry (4)
- Grapes: Beta (3), Bluebell (4), Canadice (5), Concord (4), Concord Seedless (5), DeChaunae (4), Elvira (4), Esprit (4), Frontenac (4), Himrod (5), Kay Gray (4), LaCrescent (4), Lacrosse (4), Marechal Foch (5), Prairie Star (4), Reliance (5), St. Croix (4), Seyval Blanc (4), Traminette (4), Swenson Red (4), Valiant (4), Worden (4)

Elderberries

- Adams (4), York (4)

Saskatoon berries

- Pembina (4), Northline (4), Smokey (4)

