March 2014

BARNYARDS & BACKYARDS

UNIVERSITY of WYOMING EXTENSION | AG & HORT

RMA

UW EXTENSION | AGRICULTURE AND HORTICULTURE RMA RISK MANAGEMENT AGENCY

Scott Hininger

We're 100 years strong; we'll still get you information for raising quality of life, success at whatever you do

By Scott Hininger

With 100 years of University of Wyoming Extension work being applauded in Wyoming this year, this is going to be quite an historic celebration.

When I started as an extension educator in Sheridan in 1987, we held an open house and had former educators Dan Ingram (1937-1946), Pete Jenson (1946-1970), Ross Baker (1970-1987), Alice Holstead (1946-1972), and Linnet McGoodwin (1973-1992) in attendance. If someone would have had a camera, what a picture that would of made! The stories I heard from these folks about the early years of UW Extension in Sheridan County were quite interesting, and yet the topics were very similar in what is happening in agriculture today.

Articles in this issue represent some of those same topics Wyomingites were informed about years ago – now with updated information. We still address the issues of researching new crops or new varieties, insects and diseases of crops. How do we manage agricultural operations, and what tools are available to pass this heritage to the next generation?

One difference now compared to many years ago is the amount of interest in horticultural education, but when we talk about locally grown, residents in most Wyoming communities grew their own garden produce and, in many cases, shipped it to other areas.

The strength of UW Extension is in finding what the needs of Wyoming residents are then conducting research or demonstrations that translate into information that can address these issues. The quality of life for people in Wyoming is enhanced when they are successful in their work or lifestyles, and UW Extension has played a part in this for 100 years.

I hope you enjoy the content of these articles and find something that will improve or benefit your lives.

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UW Extension celebrates 100 years of service

University of Wyoming Extension will celebrate 100th anniversary activities throughout this year culminating at the 2014 Wyoming State Fair and Rodeo in Douglas. 4-H will have county celebrations this year also leading to the fair.

Wyoming 4-H alumni can share stories and experiences gained through 4-H at http://www.uwyo.edu/4-h/100/alumni-search.html. A UW Extension traveling exhibit is being developed that will be in different counties during the summer. More information will be available later.

"My new Metz car will make 30 miles an hour." A. L. Campbell, Fremont County Agent, 1913. – from A.E. Bowman *Report Twenty-Five Years Extension Work 1914-1938.*

First Agent

Wyoming was only 25 years old when A.L. Campbell in Fremont County was the first extension agent hired May 13, 1913, and H.E. McCartney in Sheridan County was the second – starting July 11, 1913.

Campbell's salary was $1,600. To support his work, the Bureau of Plant Industry contributed $1,200, Fremont County $700, the Fremont County Farmers Association $720, and the C.B.&Q. Railroad $150.

At that time, Sublette County was part of Fremont County. Campbell traveled by train, horseback, buggy and motorcycle. At the end of his first year, his expense account showed: motorcycle, 1,118 miles, railroad, 2,078 miles; automobiles, 110 miles, total 5,208 miles at a cost of $552.65 or an average of 10.6 cents per mile.

Early Work

Reports from that time state Campbell spent most of his time working with individual farmers and ranchers: encouraging use of better seed, treating seed against smut, seeding more alfalfa and sweet clover and the use of the farm level in laying out irrigation systems.

Albert Bowman, appointed assistant state leader in farm management, demonstrations, and investigations in 1913, visited farmers and ranches by mail carrier, stagecoach, buckboard, horseback, Model T, train and bus.

(Continued on page 2)

Washakie County, Burkee Boys and Girls Corn Club, 1923

UNIVERSITY of WYOMING

100 years *(continued from page 1)*

Former educator Stella McKinstry retired from the extension service in 2006 after notching 60 years with extension. She joined in 1946. Stella, who lives in Pinedale, served with every extension director since extension's founding. Albert Bowman was director from 1914-1951, and George Starr served as director from 1952 to 1964.

UW Extension home demonstration meeting, 1920s

The Beginnings

Extending the resources of the university to producers had begun much earlier than 1914. In January 1904, a monthly bulletin "Ranchmen's Reminder" brought teaching and research to the ranching family. That March, a two-week short course was offered at Laramie for the ranchmen and farmers of Albany County. A second was presented the next year.

Then-Governor Brooks was featured at both and expressed that the short course be put on wheels so it could be taken to all Wyoming counties. He recommended the legislature appropriate $2,000 to encourage such courses. Ranchmen then formed a committee to promote an annual short course called Farmers' Institute. The institute, according to the "History Agricultural Extension in Wyoming," was the forerunner of extension.

The buildup of an extension division in Wyoming started in 1912. A memorandum of agreement was drawn between the Bureau of Plant Industry, U.S. Department of Agriculture, and the University of Wyoming College of Agriculture, providing for "Cooperative farm management students and field demonstrations."

Henry G. Knight, dean of the College of Agriculture and director of the Experiment Station, was designated Acting State Leader and directed to perfect organization of the work.

The 1913 Wyoming Legislature made a $10,000 appropriation for extension work in agriculture and home economics.

Stella McKinstry, former Sublette County nutrition and food safety extension educator, was presented a plaque by former UW President Tom Buchanan in 2006 for her 60-year employment with UW Extension.

Garden enthusiasts take advantage of UW Extension's Master Gardener Program

By Chris Hilgert

Master Gardeners benefit communities, agricultural producers and home gardeners in 19 counties throughout Wyoming with educational outreach and volunteer efforts.

Master Gardeners are trained volunteers who learn how to grow and care for plants from UW Extension experts and experienced professionals. After completing the Master Gardener certification training, Master Gardeners put their knowledge to work in their communities through horticultural education and outreach in ways that benefit families and communities.

Chris Hilgert

Those who successfully complete the training and 40 hours of volunteer service earn the title Master Gardener.

Almost 12,000 Hours of Service

Master Gardeners come from different backgrounds and ages but share common interests in gardening and community involvement. In 2013, 524 Wyoming Master Gardeners reached 35,261 individuals through 11,681 hours of volunteer service. Volunteer projects are designed to meet local needs and have positive impacts. Master Gardeners help others learn to grow, connect people with their food and beautify communities.

If you have an interest in gardening, want to learn more, and want to become more involved in your community, the Master Gardener program might be for you.

Here are some details on what to experience by becoming a Master Gardener.

Learn

Master Gardeners learn about botany, soils, flowers, trees, shrubs, lawns, vegetables, fruits, entomology, pesticide safety and diagnosing plant problems. Trainees receive approximately 40 hours of education on these topics with information specifically related to Wyoming growing conditions. They also receive *Sustainable Horticulture For Wyoming: A Master Gardener Handbook*. Fees cover all educational materials and approximately 40 hours of training.

Give

Master Gardeners give back to their communities through volunteer service after completing the training. Volunteer activities are coordinated at the local level to address local needs and opportunities. Master Gardeners are asked to provide 40 hours of volunteer time in their own communities. Some examples include diagnosing plant problems, public speaking, hands-on workshops, farmer markets, community gardens, plant clinics and information booths.

Grow

Many Master Gardeners continue with the program for years. The longer a Master Gardener stays with the program, the more they learn. Extension educators and active Master Gardeners offer advanced education to build on your base of knowledge. Master Gardeners typically enjoy the social aspect of learning together, volunteering together and helping others.

Join

To learn more about the Master Gardener program and how to join, please contact me at 307-766-6870 or chilgert@uwyo.edu. You can also visit us online at www.uwyo.edu/mastergardener. Below are locations UW Extension offers Master Gardener programs.

COUNTY

Albany	Natrona
Big Horn	Park
Campbell	Platte
Converse	Sheridan
Fremont	Sublette
Goshen	Sweetwater
Hot Springs	Uinta
Johnson	Washakie
Laramie	Weston
Lincoln	

You bet Chris Hilgert *has a green thumb. He is the Master Gardener coordinator in the University of Wyoming Extension. He can be reached at 307-766-6870 or at chilgert@uwyo.edu.*

University of Wyoming Extension | master gardener

RESOURCES HELP BUILD BETTER BIRDHOUSES FOR BACKYARD OR BARNYARD

By Donna Cuin

Many of us like birdfeeders or birdhouses in our barnyards or backyards to encourage birds or other wildlife to visit and add a little activity to gardens – especially to our winter gardens.

Springtime is a wonderful time to add birdhouses because the birds will be returning from their warm winter vacations and looking for places to raise new families. Birds that use nesting boxes or birdhouses would use cavities in dead or decaying trees without our involvement.

This One is Just Right

Birds like a cozy home but not too small. The space must be large enough for the parents and the small, but growing, baby birds. Nest builders don't want too much space so they have to fill it with nest materials to keep their little families warm. To meet the needs of the various birds that would use birdhouses for nesting, floor sizes can vary from 4 inches by 4 inches for chickadees and nuthatches up to 10 inches by 18 inches for nesting birds like wood ducks and barn owls.

Entry holes have varying sizes as well. Parents need to be able to freely come and go, but the hole must still provide protection from predatory birds while parents are away from the nest and leaving the eggs or fledglings alone as they forage for food to bring back to the nest.

Many entry holes are very similar in size. As little as ¼ inches are important in keeping the nest safe. These sizes vary from 1¼ inch for wrens and downy woodpeckers up to 4 to 6 inches for large birds.

Birdhouse Bulletins

Specifics are available in the University of Wyoming Extension *Building and Locating Backyard Birdhouses* publication. U.S. Fish and Wildlife Services provided the data for the suggested birdhouse sizes. Audubon has placement recommendations of birdhouses and dimensions for construction. Look up their detailed suggestions at http://bit.ly/audubonhouses. The book *Woodworking for Wildlife: Homes for Birds and Mammals* by the Minnesota Department of Natural Resources, Carol Henderson, has many detailed plans for construction suited to birds found near your barnyard or backyard. This and many other wildlife resources can be found at their website http://bit.ly/minnesotaplans. The University of Wyoming has three bird-related publications to help the backyard birder have more success in viewing the birds that visit or reside in Wyoming. These include:

- *Building and Locating Backyard Birdhouses*, B-995
- *Feeding Birds in Your Backyard: A great way to attract wildlife*, B-991
- *The Hummingbird: Attracting and Enjoying Wyoming's Most Fascinating Bird*, B-986

Go to http://www.uwyo.edu/ces and click on Publications on the left side of the page. Follow the prompts to enter the bulletin number.

These publications were developed and written by Rich Olson, rangeland wildlife extension specialist, now retired. Each has great information about increasing your chances of watching birds in the habitat around your home or farmstead.

Donna Cuin

Donna Cuin *loves the nature of landscapes. She should. Donna is the University of Wyoming horticulturist in the Natrona County office and can be reached at (307) 235-9400 or dcuin@natronacounty-wy.gov*

LOCATION, LOCATION, LOCATION – AND HOUSE

The key to success in getting birds to nest in the birdhouses is locating them in habitat suited to the bird and a house intended to be inhabited by that species. Most birds live in what is called a transition area of habitat between open meadows and forested lands. This area may also be referred to as the edge of a landscape. They tend to live in shrubby landscapes with plenty of cover to protect them from predators and in areas that provide plenty of flowers, fruits and seeds or insects for foraging to feed their young.

Most birds do not nest in open areas; however, there are a few, such as the bluebird, that will take over an open space area and claim it as their own territory; don't space bluebird houses too close together. Birdhouses can be mounted in many different locations from the side of the garage or garden shed, to fence posts set near a shrub bed or tree area.

One important caution is not to mount birdhouses directly on living trees. The tree will continue to grow and may eventually surround a screw or nail with new, woody tissue leaving a metal hazard behind for some future chainsaw operator to find and wreak havoc, potentially causing injury. Only mount birdhouses on dead trees or on other non-living structures.

With these tips and some attention to detail on construction, you will soon be watching a variety of new birds in your corner of paradise.

A LASTING LEGACY

An important resource for Wyoming families from RightRisk.org

By James Sedman and John Hewlett

Estate and end-of-life planning is an often neglected but crucial part of effective risk management planning for family farms and ranches.

Having a plan helps ensure continuity, success and survival of the family business the founders have worked so hard to preserve. Few operators consider just how fragile the success of their business is and what might happen should an unforeseen tragedy arise.

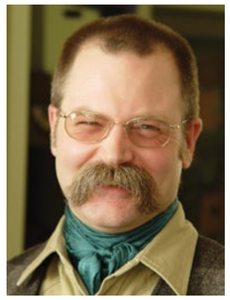
There are alternatives. The two-part, online Lasting Legacy course from RightRisk.org is an excellent way for farm and ranch families to begin the process of not just making estate plans, but thinking through the best way to pass on their legacy to the next generation.

Big Horn County Farmers Face Potential Tragedy

Brothers Ken and Rich Riff and their families have farmed in Big Horn County for more than 15 years. Both brothers are in their mid-40s and have worked hard to build a successful irrigated farm operation. Ken is married with two children, while Rich is single with no children. The Riffs have recently made expensive upgrades to their equipment they believe will put them on a path to greater success – though it required substantial debt to purchase.

Let's work through a **hypothetical** example – it is just one of many producers could face.

The problem arose when Ken was involved in a serious accident on the farm that



John Hewlett

put him in the hospital unconscious and unresponsive. As the family gathered at the hospital, not knowing if he would live through the night, Rich and Ken's wife began to contemplate what the future would be like without Ken, and they begin to worry about the future.

The family had barely talked about any end-of-life planning, much less any estate planning, and Ken's wife did not know his wishes regarding end-of-life issues. Their business was an informal partnership with no formal agreement in place. Would they have to probate the estate? How would his family be supported?

The Need for a Lasting Legacy

This is an unfortunate fact – many farmers and ranchers are grossly underprepared when it comes to estate and end-of-life planning. On one hand, that's understandable as the demands of the self-employed lifestyle take their toll and something has to give. On the other hand, if a long-term goal is the successful transition to the next generation, then this type of risk management should be a high priority.

Under the Riff's hypothetical example, it didn't have to be that way. They should not have been forced to consider the uncertainty of the future when they could have been concentrating on their ailing family member. The situation might have been avoided by utilizing the Lasting Legacy course.

If we back up a year, we can consider how events might have been different for the Riffs if they had chosen to use the Lasting Legacy course to begin the process of developing an estate plan.

Values, Life Lessons, and Intergenerational Relationships

A person's legacy entails so much more than the disbursement of material possessions in the event of a loss. The Lasting Legacy course defines a legacy as a lifetime of achievement and the context in which it will be remembered.

A successful legacy plan has four main parts: values and life lessons, personal possessions of emotional value, instructions and wishes to be fulfilled, and financial assets/real estate.

Back to the Riffs. At the request of a close family friend, the Riffs began the course. They soon realized there is a great deal they had been putting off. Full-time farming and ranching is a time-consuming business, and it is easy to concentrate on day-to-day decisions while neglecting long-term planning needs.

As they work through the first module together, the Riffs learn communication is key to the process. They begin to recognize the brothers and their families had never formalized their long-term visions for their farm business. The Riffs had always been on the same page as far as having the same short-term goals (such as high crop yields, better profitability) but had never shared with each other their long-term goals and vision for their farm.

For instance, Rich, with no wife and children, has always been actively involved in the local community by serving on numerous boards and volunteering for various youth organizations. Ken and his family learned that Rich would like in some way to impart his love of community in a lasting way as his legacy.

The course defines four interlocking parts of a successful legacy: values and life lessons, personal possessions of emotional value, instructions and wishes to be fulfilled, and financial assets and real estate.

Oftentimes, imparting values, life lessons, morals and religious beliefs are much more important to people in terms of inheritance than the various aspects of financial

inheritance.

The final part of the Lasting Legacy course deals with estate and financial planning. More often than not, people tend to focus on just the tax consequences of estate planning; these decisions should be much more comprehensive. It has been said that few farms have been liquidated due solely to estate taxes; rather, they tend to be liquidated due to lack of family preparation and planning.

Decisions on transferring real and titled property should be settled only after the bulk of the legacy has been decided. The most important decision in this step is choosing a trusted professional (lawyer or estate planner) to properly allocate assets. The Lasting Legacy workbook goes through a series of property and asset lists in this section, which includes who will be the recipients and organizational plans.

Solutions for a Better Future

After working through the Lasting Legacy course, the Riffs believe they have made progress toward preserving their legacy. They have opened up to each other about goals, disagreements, and other family issues. The Riffs have made their individual goals part of their common goals. They agreed to meet weekly to discuss the status of their operation and anything else important.

With the help of a trusted estate attorney, they have a plan for moving forward toward their legacy goals.

First, both brothers and their families establish their medical powers of attorney, living wills, and other important end-of-life documents.

Secondly, because of the uniqueness of their partnership, the Riffs move toward establishing a Limited Liability Company (LLC) for their business and living trusts for each family to help ensure continuity and stability.

Both brothers purchase enough life insurance to cover their debts and provide for their families in the event of an untimely passing. Both brothers agreed to establish a memorial scholarship fund for local students interested in production agriculture study as part of their combined legacy.

After completing the course, the Riffs moved much closer to their long-term goals of stability and certainty for their farming business and are much better equipped to deal with an emergency such as our hypothetical example in this article.

James Sedman *is a consultant to the Department of Agricultural and Applied Economics in the University of Wyoming College of Agriculture and Natural Resources, 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.*

COMMON GOALS

1) Keep the farm in the family.

2) Protect the assets they have; not have to sell them to pay taxes or probate.

3) Provide some measure of stability in the event of a medical emergency.

INDIVIDUAL GOALS

Ken: 1) Have a plan in place to provide for his family in the event of his passing.

2) Provide stability and continuity for the business to pass on to his children.

Rich: 1) Provide a plan that considers any future family (wife and children) he may have.

2) Leave some sort of legacy of his to benefit the community.

RIGHTRISK.ORG

RightRisk.org has numerous resources developed by academic professionals to assist farm and ranch families in their estate and legacy planning process, which includes the Lasting Legacy course.

Logon to RightRisk.org for more information and click the "Courses" tab from the main menu to start.

Next step in estate planning:

Management succession planning from RightRisk.org

By James Sedman and John Hewlett

Big Horn County farmers Ken and Rich Riff have attempted to implement basic estate and end-of-life planning by beginning their journey with the Lasting Legacy course from RightRisk.org.

The Riffs learned that to protect their family, assets, business, and future, they needed to make changes to their operation including living wills, estate and end-of-life planning, and to communicate better by becoming closer and more open as a family.

The Riffs also began making changes to the structure of their business by forming a Limited Liability Company (LLC) and implementing living trusts to further protect their assets and future.

Ken and Rich realized they needed to plan for the succession of management responsibilities for their successful farming business. This could be considered the logical next step in the legacy building process.

Succession planning is the successful transition of ownership, leadership and management of the business to the next generation. The Riffs choose to work through the online course Management Succession Planning: Where are we? from RightRisk.org.

The Need for Management Succession Planning

The Riff brothers, like many producers, had given little thought to how management of their business would be passed on. They had the same goal of keeping the farm in the family. They are not alone: less than 40 percent of all agricultural businesses have a management succession plan.

As Ken and Rich can attest, thinking about turning over management of a successful business when you are in the prime of your life is difficult.

As the Riffs began the course, they learned they have many of the same reasons as other farm businesses for not having a succession plan. Because of the uniqueness of their family makeup, they do not consider selling or dividing the farm a satisfactory option. They have little to no retirement savings – they view their farm business as their retirement account. They have made considerable investments in equipment to put their business on a path to future production success.

The Riffs are hardcore farmers; they immerse themselves in their business and can't consider ever doing anything other than farming.

Riff Brothers Business and Interpersonal Issues

Discussing certain interpersonal issues of the business side of management is unavoidable.

Due to the nature of farming and ranching, business and personal issues often intertwine. Much better to address these issues at the outset of planning.

At this point, the brothers began to learn how to address and deal with these important challenges that cut across their personal lives and their business.

Just as in the Lasting Legacy course, improvement of communication skills is key to the entire process. The Management Succession course outlines several ways to assess the sources of conflict and disagreement in the Riff's farm business along with the appropriate ways to deal with them.

While the Riff brothers typically work well together, their main interpersonal differences lie in the handing over of management to the next generation. Both agree that one (or both) of Ken's children should be the first option should Rich not have any children in the future. The main differences are that Rich believes the handoff should not be thought of as automatic; there should be some time and a defined process involved – he's just not sure what.

Initially, Ken saw this problem as Rich not wanting to give up control of the business and a show of sibling rivalry. After further delving into this section of the course and extensive conversations, Ken began to see Rich's point of view. It is not a matter of not trusting the next generation – rather, it is more of a matter of wanting the next generation to be properly prepared for success and to protect the business they both have worked hard to build.

On the other side of things, Ken's main concern about Rich is that he typically will let Ken do most of the bookwork and planning; Rich tends to prefer to work harder out in the field than in the office. If something were to happen to Ken, he believes his brother would have a difficult time handling the business side of the operation.

The Strategic Management Process

The strategic management process is outlined in the Management Succession Course. There are three main questions that form the basis of this course module: 1) Where are you?, 2) Where do you want to go?, and 3) How best do we get there?

RIFF BROTHERS RISK MANAGEMENT PROFILE

Available at RightRisk.org
→"Resources" Tab
→"Profiles"

Riff Brothers:

- Big Horn County crop farmers
- Raise sugar beets, barley and other crops on 600 irrigated acres
- Ken, 45, is married with two children aged 10 and 13.
- Rich, 48, is single with no children.

For More Information

RightRisk.org has several resources available for estate planning needs, including the Management Succession and Lasting Legacy courses as well as producer profiles and other risk management information and courses. Logon to RightRisk.org then click the "Courses" tab at the top of the page to start.

The main issues that tend to develop are lack of clarity about the business's management procedures and practices, lack of a formalized planning process, and lack of formal communication within the family about the direction and management of the business.

The Riffs' two main disagreements about current and future management of their farming business would fall into these categories.

One of the solutions the Riffs develop to the problem of Rich not involving himself in the paperwork side of the business involves their weekly meetings they agreed to have as part of their legacy coursework. In these meetings, both brothers (and later Ken's children if they desire) will go over all management, accounting, and other bookkeeping matters and then make decisions as a team. This should put the brothers on equal footing as far as the paperwork side of the business.

On the big issue of Ken's children and their potential for future management succession, the brothers agree to amend their trusts and farming LLC to include terms for future involvement of potential heirs. Included in this amendment is a clause that defines how long a potential management heir must have been involved in the family business and the necessary experience required.

As the Riff brothers complete the Management Succession course, they believe they have made progress on several steps for management succession. The process has required hard work, but they created a plan that fits the interests of both. In addition, they have started down the path toward the next generation assuming management responsibility for their family farm.

James Sedman *is a consultant to the Department of Agricultural and Applied Economics in the University of Wyoming College of Agriculture and Natural Resources, 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.*

Utilizing small hydroelectric – Is now the time?

By Milt Geiger

Harnessing the power of falling water in existing water projects, such as irrigation canals or municipal reservoirs, has intrigued generations of Wyomingites.

Recent changes in federal policy and improvement in technologies is enabling new electricity generation opportunities in century-old water systems.

There are two basic types of hydroelectric installations to be considered in Wyoming (assuming no new large-scale projects like the Pathfinder dam) – micro and small hydropower.

NET METERING

Wyoming's net metering law allows for renewable energy systems, including hydropower, to be safely interconnected into the electrical grid and fairly billed as a credit on electric bills.

Micro hydropower is generally a system with a rated capacity under Wyoming's net metering law (25 kolowatts). They are designed to offset your own electrical consumption.

Alternately, small hydropower is rather big by most folk's standards (up to 20,000 kW); it is designed to sell electricity to utilities for distribution to other homes, farms and businesses.

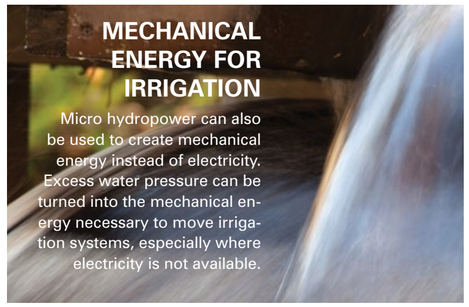
Obviously, hydropower can only be harnessed where falling water is available! The two components of the available energy are:

Head – The vertical distance (not pipeline length) the water is falling, and

Flow – The amount of water available

Following those pesky laws of physics, the greater the head or flow, the greater the available energy. For example, a flow of one cubic feet per second (449 gallons per minute) falling 70 feet has a capacity of 3 kW. Operating at 50 percent efficiency with a constant flow, the system will produce 2,170 kWh per month – more than enough for a typical Wyoming home. A system with triple the flow would need only 23 feet of head to produce the same amount of energy.

Milt Geiger



To help estimate your potential resource, UW Extension provides a basic hydropower calculator at http://renewables.uwyo.edu A word of caution: many people overestimate flow and head and fail to consider the seasonal variability of flows.

Several site characteristics contribute to a feasible hydroelectric system.

Adequate head –

Although heads as small as 3 feet can be harnessed, sites with at least 10 feet are generally needed to be economically viable.

Existing civil works –

Locations that have existing infrastructure, such as diversions, dams, or pipelines, will often have lower development costs and fewer negative environmental impacts.

Proximity to a load or electric lines –

Many good hydroelectric locations are far from electric loads or transmission lines. Just like other renewable energy systems, transporting electricity over long distances increases cost and reduces efficiency.

Clearly identified water rights –

In Wyoming, access to water is controlled by strictly defined water rights. Water flowing across your property does not necessarily give you access to the resource, even for non-consumptive use in a hydroelectric generator.

If you, your community, or irrigation district has a site with these attributes, there is more good news. Recent legislation, which passed the U.S. House and Senate unanimously, makes the permitting process for hydroelectric much easier.

Depending on where the potential project is located, the U.S. Department of Interior, Bureau of Reclamation and/or Federal Energy Regulatory Commission (FERC) have made the lease/licensing process much simpler for most projects under 5000 kW on an existing conduit (e.g., water civil works).

Remember, just because a project is technically feasible doesn't mean it is economically feasible. Wyoming has low-cost electricity (10th cheapest in the nation), so a small hydropower project may not be able to compete.

To learn more about small hydroelectric, including equipment costs, incentives, and available technologies, visit http://renewable.uwyo.edu or call your local UW Extension office.

Milt Geiger *is charged as the University of Wyoming Extension energy coordinator. He can be reached at 307 766-3002 or mgeiger1@uwyo.edu.*

Excellent resources help develop superior lease agreements

By Brian Lee

Whether a long-term lease agreement or one that changes from year to year, there are important issues to address when creating an agreement.

Many producers go from year to year and might not have a clear agreement set with the other parties involved. Having a clear contract set up is essential for the protection of the producer and also the other agreeing party.

Important Components

Here are important issues and different types of cash lease agreements for farm and ranchland.

- All lease agreements will be unique given the parties involved and the land or interest at stake.
- All written lease agreements must be dated and have very clear term dates.
- All land or property involved should be explicitly included.
- Conditions of the lease must also be in writing, including situations for termination of the lease, how the property may be used, rental rates, how expenses will be handled, etc.

Brian Lee

Don't assume you and the other party are on the same page about something in the lease that isn't explicitly expressed; have it in writing and be protected no matter how silly it may seem. More general contract writing and agreement information is at http://bit.ly/leasesheet.The ability to adjust the lease contract from year to year is beneficial with quickly changing farming and ranching economies.

A flexible lease has benefits and disadvantages for the landowner and tenant that should be weighed by each. This allows both parties to adjust their risk levels with changing crop prices, land prices and seasonal yields of the land.

Lease Tools

Excellent resources exist to help construct a working agreement to ensure the lease is equitable and protects all parties included. The University of Nebraska-Extension document EC862 "Flexible Cash Leasing of Cropland" is an excellent resource for producers looking to establish a flexible cash lease. This document covers setting up a base cash rent upon which provisions can be added for flexibility. It covers protecting upside and downside potential of a flexible lease and provisions based on yield, price and revenue. This is at http://bit.ly/cashlease.

Another excellent resource from the North Central Farm Management Extension committee pertaining to pasture rental arrangements can be found at http://bit.ly/pasturerental.

This document covers estimating landowner and livestock owner costs and returns to establish an equitable rental agreement. There is also a section on establishing lease rates that includes sharing gain and variable rates as prices and costs adjust throughout the year. Also included is a worksheet to help you get started. More information can be found at the North Central Farm Management Extension Committee website at http:/AgLease101.org/

Brian Lee *kindly was in agreement to write this article. He is a research scientist at the James C. Hageman Sustainable Agriculture Research and Extension Center near Lingle. He can be reached at 307-837-2000 or blee@uwyo.edu.*

Quinoa has potential for adding to Wyoming producer profits

By Anowar Islam

An in-depth study of quinoa's growth and management in Wyoming's conditions will begin this spring and summer by researchers in the Department of Plant Sciences in the College of Agriculture and Natural Resources at the University of Wyoming.

Introducing new, healthy, nutritious, and productive crops, such as quinoa (*Chenopodium quinoa* Willd.), could affect local food production systems and provide additional income to the producers and ag business managers.

No research work has been conducted on quinoa in Wyoming. An attempt had been made near Lingle more than a decade ago to grow this plant, but that did not continue. However, studies have been done elsewhere, including Colorado.Quinoa (pronounced as kinwa; in Spanish as quinua) is a goosefoot (*Chenopodium*) species. This grain-like crop is primarily grown for seeds for consumption. Quinoa is closely related to beets, spinach and tumbleweeds.

Quinoa is a super-special crop (see sidebar) and has become increasingly popular in the United States, Europe, China and Japan. The price of quinoa crop tripled during 2006-2013. In 2011, the average quinoa crop value was $3,115 per ton with some varieties as high as $8,000 per ton. This price is much higher than wheat prices (about $340 per ton). Addition of quinoa to the cropping systems in Wyoming may have potential to generate significant revenue for producers.

Quinoa Biology

Quinoa is an annual plant, about 3 to 6 feet high, with hairy or powdery broad and lobed leaves. The plants may be branched or unbranched and be green, red or purple colored depending on the variety. The seedheads develop either on top of the plant or from angles between stem and leaf. The seeds are tiny, about 1/13th inch (2 mm) in diameter, and different colors such as white, red and black.

Quinoa seed coats are usually covered with bitter compounds called saponin that must be removed before human consumption. Removal of the seed coats and saponins is commonly done by soaking, mechanical or chemical means, and does not affect the mineral content of the seed.

Quinoa seeds can be cooked the same way as rice and used in a wide range of food products and culinary specialty dishes including banquet parties. The whole plant is used as green forage, and harvest residue is fed to cattle, sheep, pigs, horses and poultry.

Anowar Islam

Growing Environments

Quinoa is grown in a wide range of soils and altitudes starting from coastal regions (Chile) to more than 13,120 feet in the Andes near the equator; however, it is commonly grown between 7,500 feet and 12,000 feet. Quinoa likes cool climates with temperatures ranging from 25°F during the night to near 95°F during the day.Some cultivars can withstand lower temperatures without any cold-injury. Light frost generally does not affect the growth of the plants except in the reproductive stage. However, late frost may cause sterilization of the pollen and reduce seed production. In general, quinoa requires more water with even distribution during the early growth stage, while it requires dry conditions during seed maturation and harvest time.

Quinoa prefers sandy, well-drained soils with no waterlogging conditions with a soil pH 6 to 8.5. Quinoa has low nutrient requirements and moderate tolerance to salinity.Planting time of quinoa varies depending on the location and climate. For example, quinoa planted in mid-May at Rosemount, Minn., was successful, and seeding in late April to mid-May in southern Colorado provided good stands. Planting time also has special impacts on weed control and stand establishment – a little delay or early planting could control several weeds that appear around the same time with quinoa.

Contact me for more information or answers to specific questions.

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

QUINOA LONG A STAPLE OF WESTERN CIVILIZATION

Quinoa was first domesticated by the Andean peoples around 3,000 years ago and was important to the diet of pre-Columbian Andean civilizations because of its nutritional value.

Quinoa is considered a superfood: it has a high protein content (14-18 percent), essential amino acids (e.g., lysine), and good quantities of dietary fiber, phosphorus, magnesium and iron. It is a good source of calcium, which is useful and important for vegetarians sensitive to lactose and the lactose-intolerant. Quinoa is easy to digest because it is gluten-free. Leaves are frequently eaten as a leafy green vegetable just like spinach. Hence, quinoa is being considered as a possible crop in NASA's Controlled Ecological Life Support System for humans in long-duration spaceflights.

The United Nations General Assembly declared 2013 the "International Year of Quinoa" because of quinoa's historical domestication and importance in recognition of ancestral practices of the Andean people, who have preserved quinoa as food for present and future generations. For more information, please visit http://www.fao.org/quinoa-2013/en/.

Tight beef supply contributes to strong price outlook but keep an eye on consumers

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 provides a better understanding of long-term market trends. One additional factor that also must be addressed is input costs.

Bridger Feuz

Starting in 2006, the January 1 cow inventory has declined year over year and declined again in 2013. The 2014 January 1 beef cow inventory declined 0.9 percent from 2013 to 29 million head. The number of heifers held as beef cow replacements declined from 2006 to 2011 but is starting a slight rebound. The number is up 1.7 percent in the January 1 numbers. The U.S. calf crop will be at its lowest level since the 1940s. Several factors have led to this decline in cow numbers with severe drought conditions in the south and west being a large contributor.

The beef demand index, an index that adjusts for inflation and uses 1990 as the base year for comparison with a value of 100, bottomed out in 1997 at 77 – a 33-percent decline from 1990 levels but showed consistent growth through 2004 managing a 14-percentage point increase.

Much of this growth can be attributed to a positive image of beef quality and to consumer diets that encourage protein and discourage carbohydrates; however, in 2005, the demand index again started to decline and dropped to a low of 75 in 2010. This recent decline emphasizes a constant need to focus on meeting the changing needs and requirements of consumers, especially as consumers see a tightening in disposable income. The beef demand index has rebounded slightly over the last two years and now sits at 79.

The export markets were a strong asset for U.S. beef producers in 2013. On a monthly basis, the U.S. exported on average nearly 35 million pounds more than we imported. The annual net value of our exports (sales of exports minus cost of imports) was more than $2 billion for 2013.

Favorable exchange rates and a strong demand for U.S. beef were reasons for the positives in U.S. beef trade.

Cattle producers continue to face significant input costs but did see lower corn prices in 2013. Record calf and cull cow prices also helped offset input costs in 2013. Cow-calf returns were estimated at $140 per cow in 2013 for U.S. cattle producers, with some experts suggesting the returns may have been higher for cattle producers in the Intermountain area.

Last year was characterized by a tight supply, strong export market and steady demand. This led to record price levels for beef producers. As the retail price of beef continues upward, there is risk consumers will begin to substitute away from beef.

Consumer demand and weather impacts are likely the two largest risks producers will face. This year looks to be much like 2013 with cattle supply even tighter. If the export markets can maintain and consumer demand holds, prices could again reach record levels.

Bridger Feuz *is the University of Wyoming Extension livestock marketing specialist and can be reached at (307) 783-0570 or bmfeuz@uwyo.edu.*

A bouquet for you – THE CUT FLOWER INDUSTRY

By Sandra Frost

A cut flower industry in Wyoming – outrageous, but possible!

Wyoming farmers markets patrons have created a local cut flower demand that did not exist a few years ago. Farmers market producers are supplying a niche market with flowers grown outdoors and in hoop houses. Fresh, locally grown flowers are able to compete in the global cut flower market.

George Ball, CEO of W. Atlee Burpee & Co., spoke to the Urban Agriculture Conference in New York University in Manhattan in 2012 about the disappearance of cut flowers from homes, parties, and other public and private events.

He said, "Think of cut flowers as an endangered species . . . the consumers have fewer choices in flowers than they have in vegetables in a supermarket."

Ball cited research at Rutgers University that proves fresh flowers in the home elevate mild depression or other mood disorders.

Sandra Frost

Approximately 85 percent of consumers did not know where cut flowers come from when asked in 2008.

A European Import

Specialty cut flowers were greenhouse-grown first in the Netherlands in the 1600-1700s. In the mid- to late-1700s, the first greenhouses were built in the U.S. on the East Coast near cities and towns such as New York and Philadelphia. Greenhouse production of cut flowers moved to Colorado and other Rocky Mountain states when producers recognized the benefits of high altitude sunshine and low humidity. The center of production moved again to California to take advantage of a readily available labor force. The U.S. industry grew even more with the development of refrigerated trucks and airfreight.

As of 2012, U.S. wholesale growers with $10,000 or more in sales sold $4.13 billion of specialty cut flowers, according to the USDA. California and Florida are the top states producing cut flowers.

Extensive research on cut flower production is conducted by University of California, Davis and others. Karen Panter, University of Wyoming horticulture professor and extension horticulturist, has conducted work on sunflowers grown in high tunnels in Wyoming.

Facing Flower Facts and Fallacies

There are challenges and trends all growers face.

- Cut flower growers everywhere have to plan ahead to match fashion of the times.
- Developing large quantities of flowers that coordinate with future color and housing trends may take a year or more.
- Consumers don't always realize real flowers do not look like flowers in magazine photographs. Photographs of plant materials can be staged with artificially supported flowers or unreal colors.

There are trends in marketing cut flowers just as in any product:

- Flowers produced offshore are less expensive than U.S.-grown flowers.
- The number of traditional flower shops is declining because we can order flowers via telephone or online companies.

Freshness is Key

However, there is one characteristic that makes U.S. flowers (even Wyoming flowers) more competitive – freshness. International shipping requires time. Global shipping delays that degrade flowers can and do happen.

Consumers make a value judgment each time they purchase cut flowers. Those who value freshness and U.S. production can choose U.S.-grown cut flowers – even Wyoming grown!

You bet **Sandra Frost** *likes flowers. She is a University of Wyoming Extension educator specializing in crops and based in Park County. She can be reached at 307-754-8836 or at sfrost1@uwyo.edu.*

On a global scale, production of cut flowers in South America is far larger than in the U.S. The first production of carnations in Bogota, Colombia, occurred in the mid-1960s. Bogota had high light, moderate temperatures and low labor costs. The U.S. government also encouraged Colombian growers to switch agricultural production from drugs to flowers. Today, the majority of carnations, chrysanthemums and roses sold in the U.S. are raised in Colombia.

U.S. flower producers responded to the competition by growing flowers that do not ship well. This gave florists and consumers more choices in species. Of all U.S. species grown, lilies are number one. In 1989, U.S. growers formed the Association of Specialty Cut Flower Growers to educate members and the public and conduct research. They also promote improved labeling of cut flowers to inform consumers where flowers were grown.

University of Wyoming Extension releases estate planning bulletins

UW Extension has published an 11-part series on estate planning.

Estate planning has many components, and this series will help people move forward with planning. There are topics for those refining their planning documents and for those just getting started.

The series includes:

- Introduction to Estate Planning
- Estate Planning Checklist: Information to Assemble Before Consulting Your Attorney
- After a Death: What Steps are Needed?
- Wyoming Wills: Some Suggestions for Getting the Most from Estate Planning
- Death Certificates
- A Walk Through Probate
- Disinheritance
- The Personal Property Memorandum
- Guardianships and Conservatorships
- Advance Health Care Directives
- Durable Power of Attorney

A team of UW Extension educators worked on the series with Aaron Lyttle, an attorney with Long, Reimer, Winegar and Beppler in Cheyenne, who is primary author.

The bulletins, B-1250.1 through B-1250.11, are available for free download by going to www.uwyo.edu/ces and clicking on Publications on the left side of the page. Type "Lyttle" in the Search Publications box and all 11 will come up.

For more information about the bulletins, contact extension specialist Cole Ehmke at cehmke@uwyo.edu or 307-766-3782.

Green business idea: Community Supported Agriculture (CSA)

By Cole Ehmke

With more of us choosing to eat locally grown food, the new food economy is brimming with ideas.

Those who love to nurture the soil and feed their communities are finding green projects all around – from helping organize a community garden or a farmers market to growing food to benefit families in a small town.

For those who think big, starting a community supported agriculture (CSA) farm could be a way to not only feed your green thumb but also feed friends, families and the community.

1. What is a CSA?

A CSA is supported by its members who pay for a 'share' of the farm's produce at the beginning of the year then receive a portion of whatever is harvested regularly throughout the growing season.

This model ensures farmers can earn a living even if disaster strikes and the farm is unable to produce (due to freeze, locusts). Usually, members receive a weekly basket of produce and perhaps other farm goods such as eggs. CSAs help build a community by providing a market niche for small farmers, circulating dollars within the community and connecting local customers to each other while providing fresh greens (the fresher, the healthier).

There are a variety of business models of CSA, although in Wyoming we usually see small-scale operations that are farmer-driven (subscription) as opposed to vertically integrated or consumer-driven (shareholder).

2. What knowledge or skills are necessary?

Someone considering starting a farm CSA should be knowledgeable in farming practices. Every week there will be a group of customers expecting a diversity of produce in sufficient quantities. If you have little gardening or farming experience, start by looking for a CSA in your area and volunteering, working with neighborhood gardeners or taking classes in horticulture or agriculture. There are often local options, although you can travel as part of an experiential travel program like WWOOF (Willing Workers On Organic Farms). At WWOOF.org you'll find farmers looking for volunteers to help them grow, harvest and market their goods(including some in Wyoming!).

3. How much money is required to start?

Startup costs depend on your approach, but typical costs in Wyoming would include tools such as a tiller or small tractor (plus implements), a protected space to grow such as cold frames and high tunnels to extend the season, soil improvements, tools, advertising, a delivery vehicle and so on.

4. What is the income potential?

Returns will depend on the approach and the market. If you own your own farmland and can produce at a significant scale (more than 30 shares, for example), the CSA might be able to support itself and provide a small income. Many CSAs in Wyoming are small, between 10 and 20 shares, although some are reaching 100 people. Many CSA operators find that a CSA complements other marketing options: planting more food than you need for your CSA customers helps ensure you meet the demand of your CSA, then boost income by selling the extra at a local farmers market or to restaurants or institutions. Many have a goal of helping educate the public, and you might even be able to offer other services, such as education facilities and health retreats.

5. Three questions to ask to find out if this business is right for you

Are you knowledgeable of farming practices and methods?

Do you enjoy working with your hands, working outside, physical labor,and working long hours?

Is there a fairly popular farmers market in your area at which you could sell your goods (including subscriptions/shares, as well as extra produce)?

If you can answer yes to all three, this business might be for you.

For more information, please contact me at the information below.

Cole Ehmke *is a personal financial management and agricultural entrepreneurship specialist with University of Wyoming Extension. He can be reached at 307-766-3782 or at cehmke@uwyo.edu.*

COMMUNITY SUPPORTED AGRICULTURE RESOURCE GUIDE AVAILABLE

A new resource guide from UW Extension is available to help think through options and plan a CSA. The bulletin, B-1251, is available for free download by going to www.uwyo.edu/ces and clicking on Publications on the left side of the page. Type B-1251 in the Search Publications box. Hardcopies can be ordered for $30 each. Email cespubs@uwyo.edu or click on the title of one of the bulletins on the Web page and then click Request Copy.

Plan now for the transfer of non-titled property

By Cole Ehmke

Each of us probably knows someone who won't speak to other family members because of how the non-titled property was divided.

It is relatively easy to divide money in a checking account, but it is hard to divide belongings when there is only one wedding ring, one Christmas tree angel that has been in the family for generations, one family bible, one journal, etc.

While some non-titled property may have monetary value —antiques, a piano, or jewelry, for example —usually dollar value isn't the issue here. Most non-titled objects are valued because they are "anchors" of our family memories.

Start a Conversation

If you will be spending time with family over the summer, find opportunities to begin discussions. Each family member might write a description of an object they would like to receive and explain why that item is special to him or her.

The owners/givers of the non-titled property might identify objects to transfer by writing a description of an item and an explanation of why this item is special. At family gatherings (holidays, family reunions, etc.), use belongings as props for telling family stories. Sharing stories about special objects helps family members understand their past, discover another side of their family, and appreciate their ancestors.

Share by talking, writing, through videos or audio recordings, or any combination of methods. Sharing answers to the following questions can help tell the stories and preserve family legacies: What is the name and description of the item? When and how did you acquire it? When and how have you used it? Who else owned it before you? What memories do you have of the people who owned it before you? What other memories do you have of this item?

Moving Forward

One mother was very surprised when three of her seven adult children listed a 25-cent Christmas tree ornament that had special memories for each of them. The mother still has the challenge of deciding which one of the three should receive the decoration. However, if she had not asked, the mother would never have known that the Christmas decoration was special to any of her children.

Make no assumptions about what someone else will value or why. The values given to objects may change as an individual moves from one stage in life to the next.

In Wyoming, for a list of "who gets what" to be legal, it must be mentioned in the will to be legal. The list itself is not included in the will. The list should be dated and numbered "page 1 of 10, page 2 of 10," etc. On the list: "To my family, heirs, and executor: This is the list that I referred to in my last will and testament. Therefore, please distribute the items listed below to the persons I have named."

Sign and date the list. The list can be changed as often as the donor wants but take the new list to the attorney and destroy any old lists.

Fruit growers beware:

There is a new pest in Wyoming – the spotted winged drosophila

By *Jeff Edwards and Scott Schell*

Fruit growers should be aware a new pest was identified last year in Wyoming.

The spotted winged drosophila (SWD) was suspected in strawberries in Sweetwater County in the spring of 2013 and positively identified infesting tomatoes in Goshen County in August 2013.

SWD, possibly introduced to the U.S. in 2008, was also identified in September 2013 in raspberries near Cheyenne. Since its introduction, this pest has travelled coast to coast and has taken up residence in nearly every fruit producing location in between.

SWD has a wide host range – most generally **all** types of fruit, including tomatoes.

What is somewhat unique to this fruit fly is that it will lay eggs and develop on non-ripe fruit, and it seems to prefer soft-fleshed fruit such as raspberries, strawberries and grapes. Traditionally, fruit fly species are more of a nuisance pest as they prefer overripe or physically damaged fruit. The injury from this insect most likely observed is the presence of numerous, tiny, pale-colored maggots in the flesh of ripe berries.

Professor Whitney Cranshaw of Colorado State University identified this pest in Fort Collins in 2012 and Brush in 2013.

Male SWD have a dark spot on the forewing. "The infested fruit appears to melt as the tiny maggots feed and grow," he said. The fly can complete its lifecycle on dropped and dried fruit. The rapid spread and establishment of this pest means Wyoming fruit growers will need to include integrated pest management (IPM) strategies for this pest from this day forward – it is here to stay.

Recommendations for monitoring, trap design and control can be found in recent university publications at: http://www.ipm.msu.edu/invasive_species/spotted_wing_drosophila (Michigan State University) or http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn74158.html (University of California, Davis), and there are other resources available on the Web.

Limited chemical control options are available in Wyoming because this is a new

Jeff Edwards

pest. Products labeled for use in Wyoming include Entrust (for use on strawberries) and Delegate WG (for use on raspberries). Pyganic can be used on strawberries and raspberries. All three of these products are considered an organic solution for control.

If using insecticides, be certain to read, follow and understand the label, particularly references and instruction on how to prevent resistant populations from developing. Also be aware of the pre-harvest interval (the amount of time that must pass between application and harvest for consumption).

If you suspect you have this pest, please contact Scott Schell, assistant extension entomologist at the University of Wyoming, at 307-766-2508 or sschell@uwyo.edu for guidance on sample shipping and identification.

For some, this may fall in the category of "What I don't know can't hurt me," and the reality is that we have probably been consuming these and other critters unintentionally. Best of all, the larvae taste just like the fruit on which they have been feeding.

I prefer to keep my protein source and fruit separate on my plate. Please contact Scott or myself about this pest.

Jeff Edwards *is the University of Wyoming Extension pesticide coordinator – pests tremble at his name. He can be reached at 307-837-2000 or jedward4@uwyo.edu.*

Male (left) and female (right) spotted winged drosophila. Photograph courtesy Bev Gerdeman

Do you like it RAW?

Milk production entails proper care of cows, adherence to food safety practices

By *Hudson Hill*

Raw milk is being produced and consumed more and more in this country.

Our Wyoming Department of Agriculture recently amended one of its rules to allow more access to raw milk. So, for the time being, raw milk seems more and more in demand.

While this author believes access to raw milk is fine, there are reasons we have rules and regulations established for production and sale of milk. Taking these into consideration is important when considering which type of milk you consume.

Milk can become a food safety concern when improperly produced, handled or stored. Let's talk about the difference.

Raw milk is milk that has not been processed or heated. Processed milk has gone through two main procedures: homogenization and pasteurization.

A product is heated quickly to kill or destroy bacteria during **pasteurization**. Pasteurization adds shelf life to products and, in the case of milk, helps add food safety by destroying bacteria. The chance of consuming infectious or dangerous bacteria is reduced.

Homogenization changes the structure of fat in milk. Milk is forced through small holes under pressure to break fat globules into smaller particles during pasteurization. This in turn prevents cream from rising to the top of milk and makes a more consistent product.

Producers and consumers of raw milk enjoy their product and will gladly tell you about its many great properties while others will tell you raw milk is not worth the associated risks. The answer lies in the middle for this author. I will discuss my considerations in three areas: the cow, quality and legality.

Success starts with the cow

Volumes are written describing in detail all the ways to properly care for a milk cow. The main point for this article is, if you want to drink raw milk, understand where milk is coming from. Raw milk must come from a healthy cow that is fed correctly and living in and being milked in adequate facilities. Producing and consuming raw milk will not be successful if the cow is not cared for properly.

Three key cow care things to think about.

Feed

Feed is the number one consideration for milk cows.

Hudson Hill

Although these animals are generally quite good-natured, they are still large livestock. Facilities need to be adequate to house and milk properly.

For long-term success, producers need a plan to ensure their cows become pregnant each year.

Remember, cows will give 6-10 gallons of milk during parts of their lactation cycle when fed adequately. What are you going to do with all that milk?

Quality

Precautions should be taken before milking the cow because raw milk is not processed. Take every avenue to ensure a bacterium or pathogen is not in the milk. The cow, the facilities and the equipment must be kept free of harmful bacteria and pathogens. Bacteria numbers in milk double every 20 minutes milk is above 70 F degrees. Cooling milk rapidly is a decided advantage of commercial dairies.

Legal

Like other food products, the production and selling of milk products is regulated by state and federal agencies. For any endeavor in production and consumption of milk, raw or otherwise, understanding and following current laws will help with success.

Regardless of where someone chooses to acquire their milk or what type of milk it is, milk is a great product with many benefits. Humans have been consuming milk and dairy products for thousands of years. This author would sure hate to see anyone go without it.

Hudson Hill, *a University of Wyoming Extension educator based in Lincoln County, loves to drink milk. He can be reached at 307-885-3132 or at hrhill@uwyo.edu.*

Do your small grain fields have bad complexions?

By *Scott Schell*

"Whiteheads" is the name given to the pale, empty seedheads attached to healthy green stems caused by wheat stem maggot (WSM) feeding damage.

Whiteheads are in almost all of the common small grain crops grown in Wyoming and are caused by a single WSM maggot "mining" the stem between the top node and the seed head, which prevents development of grain.

In 62 Percent of Fields Surveyed

In an intensive survey of wheat stem feeding insect pests in the Northern Great Plains, WSM was present in 62 percent of the fields sampled. Fortunately for farmers, the average infestation rate was only about 3 percent within fields sampled. The average annual losses attributed to WSM are small but add up over time. If your profit margin is small, looking at ways to reduce any losses make sense.

Scott Schell

WSM's lifecycle is detailed in the sidebar. The first step in Integrated Pest Management (IPM) is to identify and know the pest. Winter and spring wheat varieties are frequent targets of this true fly, scientific name *Meromyza americana,* in the Chloropidae family of the Order Diptera. However, barley, oats, rye and many grass species can also be hosts.

Solid stem varieties of wheat developed to resist the damage caused by another common and increasingly serious pest – the wheat stem sawfly – are not effective against WSM.

WSM is a native insect that also utilizes many native species of grass for reproduction. It has readily adapted to use the stems of small grains and produces two generations per year. WSM has a high reproduction rate, and any control measures require 90 percent or higher efficacy to see any decline in the next generation's population.

Control Methods

IPM recommendations for this pest consist of crop rotation, if possible, and include a non-susceptible crop like sunflower. Control of grassy weeds and volunteer small grains in fields to reduce WSM populations before planting the next crop is also thought to help. Tillage to destroy the overwintering larvae of WSM, if compatible with your farming methods, will also reduce populations the next spring.

There is no universally recommended insecticidal control method for WSM. The timing to make the application during the short time periods the adults WSM are active in the fields is critical for good control.

Two experiments with insecticides to determine the correct application time for best control of WSM on hard red spring wheat in North Dakota showed an increase of more than 10 bushels between the best-timed treatments and untreated plots. The timing recommended in North Dakota for best control of WSM was starting at the four to six leaf stage through the flag leaf stage on hard red spring wheat with a labeled pyrethroid insecticide.

More research is needed to determine economic thresholds, best treatments, their timing, and for finding biological control agents that will follow the WSM into grain fields. Keep scouting grain fields for pests, practice IPM, and maybe your fields will have perfect "complexions" someday.

Scott Schell, *University of Wyoming Extension assistant entomologist, is probably busy studying insects at this very moment. He can be reached at 307-766-2508 or at sschell@uwyo.edu.*

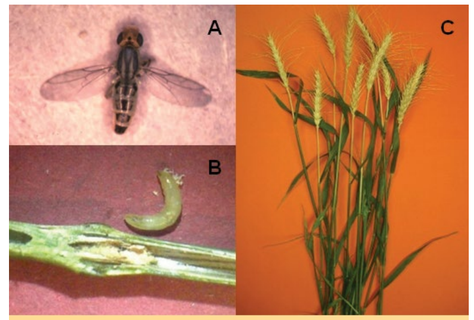


Figure 1. Wheat stem maggot adult (A), maggot with stem feeding (B), and infested plant *(C)* with white head and stem down to first node, but leaves remain green; head with stem pulls easily from plant where maggot has chewed stem above node.

This illustration comes from the U. of Minn http://www.nwroc.umn.edu/Cropping_Issues/2008/May_13/ASmallPrimeronPesticideLabeling/index.htm

WHEAT STEM MAGGOT LIFECYCLE

Wheat stem maggots (WSM) spend winter as a maggot low in the stems.

It pupates and emerges as an adult in the spring. On spring-planted grain crops, the first generation larvae reduces plant tillering – damage that is hard to quantify. On fall-planted wheat, a single maggot feeding inside the stem below the developing head causes the very visible whiteheads.

To distinguish between a whitehead caused by frost injury and WSM feeding, just grab and pull the head. The WSM-damaged head will slide easily out of the flag leaf, and the stem will be hollow and full of grass. The WSM will usually be gone.

The second generation of WSM adults oviposit in the stems above the top node of the spring-planted grains and cause whiteheads on that crop, or they will utilize volunteer wheat in the field or move into grassy areas adjacent to the fields to find suitable host plants for their larvae.

PREPARE, PREPARE, PREPARE

Images from flooding in Colorado, Wyoming fires and drought reminders now is best time to prepare for disasters

By *Kellie Chichester*

Many ranchers and farmers spend a lot of time working on business plans, mission statements, goals and financial management.

How many spend time discussing disaster plans?

Wyoming, along with neighboring states, suffered catastrophic events in 2013; flooding, fires, blizzards and drought. A disaster plan would not have saved acres of corn or numbers of cattle, but it may have helped with how folks moved forward.

A disaster plan may help protect property, facilities and animals. Here are some suggestions.

Develop an emergency contact list. Some emergency numbers to include could be:

- Employees, neighbors
- Veterinarians – local and state
- Extension service office,
- Trucking company,
- Brand inspector,
- Highway patrol, and,
- A contact person outside the disaster area.

Numbers stored in a cell phone may not be accessible. Also, think through where to take livestock – the local sale barn, neighbors, etc. – if evacuation is needed.

A livestock emergency readiness checklist may be the next to-do. Here are some questions to consider. If you can answer yes to all of these, consider yourself prepared.

- Do you have a backup source of power, sufficient fuel supplies – for a generator, equipment and vehicles?
- Are fire extinguishers available in barns, shops and vehicles? Have you tested your fire extinguisher recently?
- Do you have water and feed – enough for two to three days without refilling should you not be able to reach your livestock?
- Is there on-farm veterinary aid available?
- Do you have access to your insurance policies in an emergency? Disasters are often not covered by insurance companies unless specifically listed in policies. This may be a good time to review policies.

A ranch or farm map may help first responders and neighbors. This can be a basic outline of facilities with shop or barn names. Response times will slow if locations are unknown, such as directions to a calving barn. Include where pesticides and herbicides are stored. The location may dictate how an emergency crew responds and with what equipment.

Kellie Chichester

Once your disaster preparedness plan is in place, communication is key. Share with your family, employees and others you think may be involved if a crisis strikes.

While many of these things seem simple, they can be overlooked in times of high stress. Letting others know where these materials are enables them to carry out your wishes if unable to be present.

Information that may be helpful in developing a disaster plan can be found at these links or by contacting your state Extension Disaster Education Network (EDEN) representative.

http://readyag.psu.edu/

http://www.eden.lsu.edu

http://www.ag.purdue.edu/extension/eden

http://www.ag.ndsu.edu/disaster

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Mineral leasing: Negotiating an oil or gas lease

By Cole Ehmke

Many oil and gas companies considered gas found in tight, very low permeability geologic formations uneconomical to produce.

Now, directional drilling and hydraulic fracturing are being applied to unconventional sources. Such advances have significantly improved the production of oil and gas in locations like the Barnett shale formation in Texas, the Marcellus shale formation in the Appalachian basin and the Niobrara formation of shale in eastern Wyoming.

Property owners may be getting calls and visits about developing the minerals. If you've never negotiated a mineral lease agreement, the experience can be bewildering because of the unfamiliarity of the terms and the details and the legal language in the lease document.

The essence of a lease revolves around two items: the **royalty fraction** and the **signing bonus**. These two elements are the core of the deal and will translate into the most money for the mineral owner. Further terms to negotiate will be associated with protecting the surface and will be put in addendums to the lease.

Royalty Fraction

When a private landowner owns the mineral rights on a property, terms of a mineral lease agreement center on the percentage of the production paid to the mineral owner (the royalty). A percentage of the market value is paid to the mineral owner for every barrel of oil production or 1,000 cubic feet of gas production.

Levels might be around a 3/16 share (18.75 percent). In competitive areas, 1/5 may not be uncommon. The table below translates common levels into their corresponding percentage.

Cole Ehmke

The royalty fraction is whatever the mineral holder negotiates. It is likely the single most important term since it will translate into the most money if development is successful.

Signing Bonus

The bonus is the amount of money received within a certain period upon signing a lease. It is a cash incentive to sign a lease. A signed lease does not mean the company will end up drilling, and it certainly does not mean it will find minerals in paying quantities (meaning that there may never be money from production, so the only money the mineral owner may ever receive is the bonus).

The bonus will be specified in the lease agreement (often as a dollar amount per acre) of land.

Mineral owners will likely see wide variations in the amount of money offered. A number of factors are at play, including the amount of acreage controlled by the owner, location of the potential mineral deposit (particularly if it is close to known production), the number of operators seeking the lease and other factors like location of the nearest pipeline (for gas development) and ease of access to property. All of these affect the negotiating position of the mineral owner and thus the terms of the bonus and the royalty fraction.

Other Terms

While the royalty and the signing bonus are the most important terms of the deal, there are many other important terms to be negotiated, including :

- length of the primary term (period of time in which the company will investigate the production potential for the property further),
- options to extend the lease's primary term,
- shut-in royalties for when a well is not producing,
- the size of the units, and
- any pooling with other lands.

Other issues of importance include potential environmental damage, disruption of activities on the surface and reclamation of exploration and development sites.

Many of these terms will be in the lease document itself. Other items of importance to property managers can be addressed separately in addendums to the contract that address numerous lesser points.

A Legal Document

Oil and gas leases are legal and binding contracts. The contract is the agreement between the mineral rights owner and the oil and gas exploration and development company. Everything important to each party in the mineral development process should be in the contract.

For a lease to appeal to both sides, the language must be worded carefully so it provides maximum opportunity for the oil and gas company while also providing maximum protection for the landowner. Because the language used in leases is complex, and the agreement could potentially be a long-term commitment, having the lease reviewed with a knowledgeable attorney with experience in mineral leasing contracts is wise.

Split Estate

For those who own the surface rights but not the mineral rights (a split estate: surface rights have been separated from the mineral rights so they are owned by different people or entities), there is the concern mineral exploration and development will adversely affect the land surface.

With a split estate, the severed mineral rights are dominant over the surface estate, meaning that the mineral owner (or the company that leased the mineral rights) has the legal right to enter onto the surface of the land (with notification and permission as provided in Wyoming law) to explore for and develop mineral deposits.

Since the mineral owner's aim is development of the mineral, the lease negotiation may not address surface issues to the degree the surface user prefers. The interests of the surface and mineral estate owners may even be in conflict, and the mineral owner may not even give the surface user an opportunity to address concerns about how the surface use will be changed regarding issues of seismic exploration, right-of-way locations, wastewater pits, the dust and noise of drill rigs, storage tanks, pipeline routes and well locations.

> If you've never negotiated a mineral lease agreement, the experience can be bewildering because of the unfamiliarity of the terms and the details and the legal language in the lease document.

Final Thought

Once a mineral owner is approached about leasing minerals, important points to address in the negotiation of the lease are the terms of **royalty rates** and **signing bonus** and issues of importance such as compensation for damages, disruption of activities on the surface and reclamation of exploration and development sites.

Each lease is the result of a negotiation between an oil and gas exploration and development company (the operator) and the owner of the mineral rights. It is the mineral owners' responsibility to identify issues of importance and negotiate terms that are in their own best interest.

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