



BARNYARDS to BACKYARDS



Profitable & Sustainable
AGRICULTURAL SYSTEMS
UW Cooperative Extension Service

UNIVERSITY
OF WYOMING

UW extension initiative team offers educational resources

*By Jim Gill,
University of Wyoming,
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Cooperative Extension Service*

The University of Wyoming Cooperative Extension Service's Profitable and Sustainable Agricultural Systems Initiative Team is geared toward providing the people of Wyoming with educational resources.

The articles in this publication explain some of those efforts.

In addition, the team helped plan and promote the "Keeping Wyoming Safe and Secure Conference" in the fall in Casper. More than 150 people from throughout the state and region attended to learn about emergency preparedness pertaining to food safety, livestock, crops, public health, and the economy.

The CES group also produces the weekly horticulture series "From the Ground Up" for KTWO television station in Casper. The programs present information on current yard and garden topics that arise from planting time to harvesting time.

A recently completed CES manual for Master Gardeners is designed to assist volunteers who, along with statewide UW educators, help Wyoming's citizens with their landscapes.

Remote sensing utilizing satellite imagery, risk-management strategies, underground drip irrigation systems, and alternative crops are just a few of the topics related to production management that the team is investigating.

Providing educational resources related to forage-based livestock systems is part of the nucleus that drives the team's efforts. One of the major focuses has been the management of the young beef female.

The group conducted a series of programs on such topics in Riverton, Worland, Gillette, Torrington, Douglas, and Sheridan in November and early December.

Educators also recently completed a statewide survey of residents living on 100 or less acres in Wyoming to find out their needs and concerns.

The UW CES Profitable and Sustainable Agricultural Systems Initiative Team is striving to provide Wyoming's agricultural communities with research-based information.

To learn more, contact team chairman Jim Gill at (307) 347-3431 or jrgill@uwyo.edu.



Black henbane is a weed that thrives when land is disturbed.

Help! My property is overrun with weeds!

By Stephen Enloe,
University of Wyoming
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Weeds are a common problem for landowners throughout Wyoming with both large and small acreages.

While many people consider weeds to be an agricultural problem, the reality is that they also have serious impacts on rangelands, wildlands, roadsides, and suburban areas. Many weeds reduce habitat quality and forage availability for wildlife and livestock, strongly compete with native plants, inhibit recreational activities, increase wildfires, and use up limited water resources.

For small-acreage landowners, weed problems are often exacerbated due to increased land disturbance, heavy grazing pressure, differing management philosophies among neighbors, and intentional introductions of weedy ornamentals.

One of the primary issues for small acreages in terms of weeds is the sheer magnitude of disturbance that occurs when a new area is developed. Subdividing large tracts of land into smaller parcels results in a greater percentage of disruption to the area due to increased road, driveway, home, garden, and outbuilding construction.

In most cases, these types of construction result in the complete removal of native vegetation such as forbs, shrubs, and perennial grasses. Bare ground is often left exposed for several months.

Unfortunately, many weeds are highly successful in colonizing these heavily disturbed, bare areas faster than the native vegetation. Newly invaded spots then serve as a source for subsequent dispersal to other disturbed areas as development increases. Houndstongue and black henbane are two examples of successful weeds that thrive following the impact of initial construction.



Scotch thistle is unpalatable to grazing animals.

The second aspect of weed problems in small-acreage development involves landowners who keep animals (especially horses and cattle) on small pastures. If not properly managed, even a few animals kept in a small area can be a recipe for disaster.

Grazing animals often prefer certain plants over others and will selectively feed on the most desirable grasses and forbs, leaving the bitter, coarse, spiny, and generally unpalatable plants untouched. While most desirable grasses and forbs are highly adapted to some grazing, overuse eventually weakens them to the point of decline and even death. The result is a conversion from desirable grasses and forbs to spiny and unpalatable forbs like curlycup gumweed and Scotch thistle.

The third aspect involves the increased intentional import of potential weeds into Wyoming. Many dispersal limitations and natural barriers to weed movements around the world have now been overcome by both regional and global trade and travel. As people move into new areas, they have historically brought with them many ornamentals that have escaped cultivation to become serious weed problems.

Some plants in this category that have plagued Wyoming include yellow toadflax (also called butter-n-eggs), purple loosestrife, oxeye daisy, and common tansy.

When designing horticultural plantings, a good practice is to use native species where possible and avoid using any plants that have been observed to escape cultivation.

The fourth aspect involves differences in management styles and philosophies among small-acreage landowners in a given development.

If a large tract of land is owned by one person, that person has complete say over weed management for the entire area. However, when the land is sold and subdivided, there may be many attitudes and opinions regarding weed management over that same tract of land.

While it is not always fair or justifiable to blame neighbors, weeds clearly do not stop at property lines. Therefore, if a landowner is surrounded by less diligent or seasonal neighbors, the overall weed problems will eventually become that individual landowner's weed problems.

The solution requires a whole-community approach to weed management and

the development of coordinated teams that include private landowners, public and private organizations, and government agencies. Working together is a crucial component of effective weed management over property lines.

There are several sources of information concerning weeds and weed management available to Wyoming residents. Local Cooperative Extension Service offices and Weed and Pest District offices can provide advice and resources for understanding weeds and developing effective weed-management strategies.

Publications that can help include *Weeds of the West* and the *Weed Management Handbook for Montana, Utah, and Wyoming*. The 2005 edition of the handbook will be available in February.

Web sites offering weed information include the Wyoming Cooperative Agricultural Pest Survey at w3.uwyo.edu/~caps/caps.html, the Wyoming Weed and Pest Council at wyoweed.org, the Weed Science Society of America at www.wssa.net, and the Center for Invasive Plant Management at www.weedcenter.org.



Small-acreage ownership requires animal stewardship

By Wayne Tatman,
University of Wyoming,
Goshen County Cooperative
Extension Service

The all-American dream for some is to buy a piece of property outside of town, build a home, and raise a few animals.

Whether those animals are dogs, cats, sheep, or horses, small-acreage owners need to understand that there are responsibilities involved in keeping them healthy, staying on the right side of the law, and being a good neighbor.

Steve Kerr, a veterinarian with the Bear Creek Veterinary Clinic in Goshen County, recommends that animal owners contact a local veterinarian for information about health and vaccination programs for different animals. In general, all animals need to be treated for worms at least once a year, and many of them should be wormed twice a year.

To ensure proper nutrition for animals, owners are urged

to use high-quality feed. Healthy hair coat is an indicator of a good nutrition program.

- Horses, donkeys, and mules should have annual vaccinations for eastern equine encephalitis, western equine encephalitis, tetanus, and influenza. Annual vaccinations for West Nile virus continue to be recommended.
- Outside cats should be vaccinated for distemper, leukemia, and rabies starting at 6 to 8 weeks old and should be given a booster each month after that until they are a year old.
- Dogs should also have a series of three vaccinations for distemper, parvo virus, and rabies starting at 6 to 8 weeks old with a monthly booster.
- Cattle need to be vaccinated for IBR, BVD, PI3, and BRSV and receive a seven-way clostridial in-



Veterinarian Steve Kerr of the Bear Creek Veterinary Clinic in Goshen County examines Kathy Seymour's dog.

fection treatment at branding time with a booster at weaning. Heifers should be vaccinated for brucellosis before they are a year old.

- Horses, cattle, pigs, sheep, and goats being moved out of the state must be

accompanied by an official health certificate from a local veterinarian. Most states also require that a Coggins test must have been administered within the past year.

- Cattle, sheep, goats, and horses being moved

across county lines are required to have a brand inspection. If the animals are being moved out of state, they will need to have had a health inspection by a veterinarian.

Being a good animal owner and neighbor means keeping animals on one's own property and under control at all times. Dogs are of particular concern because they readily chase all other animals. "I treat more animals as a result of dog bites and being chased into fences than anything else," Kerr reports.

References for further information include: *Sheep Industry Handbook* by the American Sheep Industry Association, *The Revised Health Problems with Horses* by Robert M. Miller, *DVM* from Western Horseman, Inc., *Nutrition of Dogs and Cats* by Purina, and a textbook titled *Natural Health of Dogs and Cats* by veterinarian Richard Pitcairn.

Growing the organic way could increase producers' profits

By Brett Moline,
University of Wyoming,
Albany County Cooperative
Extension Service

Most producers are constantly looking for ways to increase their net income. One possible way to do that is to grow crops organically. National standards and guidelines have now been written that outline what certified organic production can and cannot be. Some consumers will pay as much as 200 percent extra for certified organic goods such as hay and meat products.

What does it take to become certified? Actually, many producers are probably closer to certification than they may think. The National Organic Program Regulations and Guidelines state that no man-altered chemicals can be used unless they are noted on a list as being acceptable. All natural inputs can be used unless they are considered inappropriate according to the rules.

A farmer who does not fertilize hay or treat for weeds



Organically produced vegetables are often sold at farmer's markets.

within a hay field is probably already on the way to becoming an organic grower. Producers who do not implant calves or administer sub-therapeutic levels of antibiotics might also be closer to being certified organic agriculturalists than they realize.

Land used for organic production must follow organic practices for three years before certification can be

granted. If a farmer's records can show that he or she has not performed any non-allowed activity or procedure for three years prior to harvest, the resulting crop could be certified. Livestock need to be managed organically as fetuses at the beginning of the third trimester until they are slaughtered to be certified organic.

Research must be accomplished before a farmer or rancher can decide if organic production will work. The cost of achieving organic certification can be at least \$2,000, which includes being inspected to ensure that organic guidelines are being followed. Changes in operation and production costs must be identified. Dependable outlets or markets for selling must also be found.

Information concerning organic production can be obtained by contacting a local University of Wyoming Cooperative Extension Service office.

Team Agriculture

The University of Wyoming Cooperative Extension Service (CES) Profitable and Sustainable Agricultural Systems Initiative Team is dedicated to a profitable and sustainable approach to complex problem solving. The team is comprised of educators from nine CES areas throughout the state. It also involves College of Agriculture specialists and department heads representing agricultural and applied economics, animal science, plant sciences, and veterinary sciences.

The team's primary goal is to promote the adoption of sustainable agricultural systems through educational programming involving forage-based livestock systems. The focus is on crops, the young beef female, horticulture, and small acreages.

Representing CES are Jim Gill of Washakie County, Wayne Tatman of Goshen County, Hudson Hill of Lincoln County, Tanya Daniels of Campbell County, Frank Henderson of Converse County, Scott Hininger of Sheridan County, Brett Moline of Albany County, Donna Cuin of Natrona County, and Ron Cunningham of Fremont County.

Team members from the Department of Plant Sciences are Jim Krall, Dave Koch, Karen Panter, Mark Ferrell, and Steve Miller. The Department of Animal Science is represented by Steve Paisley and Doug Hixon. Other participants include Donal O'Toole of the Department of Veterinary Sciences, Tom Thurow of the Department of Renewable Resources, Duane Williams of the CES office, and John Hewlett and Nicole Ballenger of the Department of Agricultural and Applied Economics.



Federal crop insurance programs designed for new and

By James Sedman,
Sedman Economics, and
John Hewlett,
University of Wyoming
Cooperative Extension Service

Crop insurance can be an effective risk-management tool for agricultural producers. An experienced producer may know the crop insurance options that are available, but producers new to agriculture may not.

To determine what kind of option might interest them, new producers should first determine the goals of their enterprise by asking some basic questions. Does the farm or ranch need to make a profit from production? Is the operation's only purpose

to pay the real estate or water taxes? Is the goal of the entity to maximize profit per acre or on a per-head basis? If the answer to any of these questions is yes, then some form of crop insurance may be appropriate for risk-management purposes.

Crop insurance is much more effective for farmers who keep accurate production and financial records. Those with records chronicling a long period of time generally have higher actual production history yields. Such yields can equate to higher levels of insurance coverage. Producers who keep accurate financial records are also in a better position to ana-

lyze their operations to decide the level of crop insurance necessary for their needs.

The goal of purchasing crop insurance coverage should not be to purchase the most coverage but to maximize the effectiveness of the coverage purchased.

Once a producer has determined an actual production history yield (new producers are given a transitional yield), a decision on what type of coverage to seek can be made. The choice of insurable units depends on the crop and policies offered, but generally the smaller the unit insured (optional over basic units, for example) the more effective the coverage.

The policy chosen should be based on an operation's goals. If a producer only wants to cover real estate taxes, a low-cost catastrophic loss policy for near-complete yield losses would be the best option. Typical multi-peril insurance policies can protect a predetermined yield level, and income protection, crop revenue coverage, and revenue assurance policies can progress toward insuring a certain revenue level.

New or small producers can also insure their forages. There is a noninsured crop disaster assistance program through the Farm Service Agency for crops that cannot be insured under an

existing county crop insurance program. There are usually several options for forage producers to use depending on the area in which they live. It is important to remember that typically as the amount of coverage increases, the premium cost increases.

Crop insurance can be just as effective at mitigating production risks for small-scale operations as larger operations. The main production risk for a small-scale producer who has 100 acres of irrigated alfalfa and enough pasture for 75 registered Angus cattle would be a yield loss on the irrigated hay. A multi-peril policy on the forage could help prevent that. If the



Combines harvest wheat in Wyoming. Crop insurance can help protect against production losses.

Crop insurance can help proo

By James Sedman,
Sedman Economics, and
John Hewlett,
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Producers must deal with much risk and uncertainty. Market fluctuations, supply and demand, weather, and other natural disasters can all negatively affect their income. Crop insurance is a tool to help farmers manage risk.

What is Crop Insurance?

Crop insurance can negate some or all crop losses. For example, a farmer might buy a policy on corn earmarked for silage. A bad drought might make the yield a fraction of what it would be in a normal year. The insurance on the corn will cover at least some of the lost income.

Crop insurance has been available in certain forms in the U.S. since 1938, and today there are a variety of insurance options. These are sold and serviced by more than 20 private companies subsidized by the



federal government through the U.S. Department of Agriculture's Risk-Management Agency (RMA). This agency oversees and approves policies, procedures, prices, and insurance plans for more than 100 approved crops.

What are the main types of crop insurance?

There are two main types of crop insurance available to producers: actual production history contracts and revenue insurance contracts. For farms that are not covered by RMA-approved insurance, federal non-insured disaster program payments through the Farm

Service Agency are an option.

Actual production history-type crop insurance policies are yield based and include multiple-peril and group-risk insurance. When a farmer purchases this type of policy, he first establishes the actual production history for the crop and a particular growth unit. He can prove his yield for up to ten years, but a minimum of four actual or transitional yields are needed to establish a production picture. He then chooses a level of coverage ranging from 50-85 percent of the history. This serves as the production guarantee to determine the indemnity payments when a yield loss occurs.



small-scale producers

operation's hay yields were as low as 30 percent due to drought, having such a policy would allow the producer to be able to purchase hay to cover at least a percentage of the yield losses. In this sense, crop insurance on hay could mean the difference between selling cattle because of yield loss or keeping them and purchasing hay.

Crop insurance can also be effective for small farms where production is not the primary source of income. For a small-scale cash grain farmer who owns 80 acres and works off the land, income-protection insurance that would protect a certain level of income generated

by the farm might be an option. Enterprises with absentee owners or owners with a share in the crop can also negate at least some of the production risk with crop insurance.

Crop insurance availability varies by county. A local crop insurance representative can explain what policy options exist in a particular area. Farm Service Agency offices have information about crop insurance agents.

More information on this and other risk-management topics can be obtained at the USDA Risk Management Agency site at www.rma.usda.gov

producers manage risk

With multiple-peril policies, payments are made when yields are lower than the production guarantee on an individual farm or unit if basic or optional units are also elected. As is the case with group plans, payments are made when yields drop below a certain level on a countywide basis.

Revenue insurance policies have a variety of plans to fit individual options. Crop revenue coverage, revenue assurance, and income protection contracts pay for losses in revenue by an individual producer. Revenue declines can be caused by low yields, low prices, or a combination of the two.

Where can a producer obtain crop insurance?

Agent information pertaining to Wyoming is available from local Farm Service Agency offices. There is also an online listing of all the crop insurance agents in the United States at www.rma.usda.gov.

The availability of these insurance plans varies by area and by crop. Typically more crop insurance plans are accessible to producers of traditional U. S. Department of Agriculture program crops like corn and wheat and in the areas of the country that typically grow these crops.

However, insurance has become a much more viable option for farmers who were previously uninsurable like those who grow alfalfa hay or who manage smaller acreages. This was brought about in part by the Crop Insurance Reform Act of 1994, which made a wide array of federally subsidized insurance options available to producers.

Further information about local crop insurance plans is available at the RMA Web site at www.rma.usda.gov/policies. Articles about insurance and agricultural risk management information can be found at agecon.uwyo.edu/riskmgt.

Trees provide a windbreak at the University of Wyoming's Sheridan Research and Extension Center.

Shelterbelts can improve environmental conditions

By Scott Hininger, University of Wyoming, Sheridan County Cooperative Extension Service

Shelterbelts can improve ecological conditions for wildlife and humans and help improve the environment at the same time.

Planning a shelterbelt area depends on what protection is desired, how much space is available, and the number and types of rows and mixes of trees and shrubs that will fit the project.

To harbor birds, it is important to order trees and shrubs such as Cotoneasters, honeysuckles, sand cherries, Nanking cherries, wild plums, sumac, chokecherries, and buffalo berries that suit their winter feeding needs.

Natural barriers also provide cover for deer, small mammals, pheasants, and grouse and offer nesting places for small insect-eating birds. They can also help control soil erosion and waterway pollution.

Trees and shrubs are coolants in the summer and reduce wind chill effects in the winter. An effective windbreak on three sides of a building can reduce annual fuel costs by as much as 30 percent. Summer air temperatures in tree shade can be as much as 25 degrees cooler than in direct sun. Evergreens, which do not lose their needles, might block winter winds better than deciduous trees that go bare in cold weather.

Properly located plant protectors can act as snow fences by preventing drifts from accumulating on roads and near buildings. Research has shown that shrubs are the most effective living snow fences because of their density. It is important to keep the distance between shelterbelt plants and driveways or buildings at 10 to 50 times the height of the barrier itself.

Another management practice involves planting greenbelts along streams and drainages to help prevent soil erosion and nitrogen nutrient losses from entering the waterways. Research has shown that planting areas next to streams and rivers with vegetation dramatically decreases water pollution. It also develops excellent wildlife habitat. There may also be cost-share money available for such projects from the Natural Resources Conservation Service.

When constructing a windbreak or wildlife habitat area, spacing between the trees, shrubs, and rows is very important. A suggested spacing of from 6 to 20 feet between rows is recommended with at least an additional four feet for tilling to keep weed and grass competition under control. The distance within rows should be 6 to 12 feet for shrubs and 9 to 24 feet for trees. It is best to determine the mature height and width of species to be planted and adjust the spacing accordingly.

When planting a windbreak or wildlife area, keeping weeds and grass away from the trees and shrubs can be as important as watering. Using landscaping fabric or herbicides, tilling, or mulching can help control these undesirable plants. Mulching helps minimize water needs. The amount of necessary supplemental water will depend on the species selected along with climatic conditions and the soil type.

After three to five years, very little supplemental water will be required if weeds and grass are controlled and drought-resistant plants are selected. Another consideration is fencing out deer and cattle until the trees reach close to a mature height.

Trees should be replanted at the same level they were grown in a nursery, not higher or lower. A one-inch difference in depth could adversely affect a tree (depending on its size) three to five years later.

A planting hole should be about the same depth as a root ball but at least three times the diameter of the root ball or container. This allows plenty of room for roots to grow into loose soil. Amending native soil with organic matter is not recommended for tree and shrub planting any longer. Nitrogen fertilizer isn't appropriate the first year, but adding phosphorous fertilizer in a hole at planting time is recommended.

After a tree is in position, one can begin adding soil all around it, slightly firming the dirt and alternating it with water so that it soaks without leaving any air holes. Mulching around a tree will help to retain needed moisture as well as keeping the soil cool and aiding in weed control.

There are several publications available from the University of Wyoming Cooperative Extension Service (www.uwyo.edu/ces/PUBS/) that describe desirable trees and shrubs for Wyoming. The conservation districts and some extension offices offer seedling trees for sale in the state.



Underutilized native trees can add to landscapes

By Tom Heald,
University of Wyoming,
Natrona County Cooperative
Extension Service

It isn't easy growing trees in Wyoming. One look at the prairies confirms that. Yet as most homeowners would attest, trees are the single most important plants in landscapes. For some folks, trees are like annual flowers – grow them for a year and by next year replant them. However, there are trees that do thrive in the state. In fact, they are native and adapted to the difficult soils, heavy winds, huge temperature fluctuations, and persistent droughts common to Wyoming.

The two most frequently planted native trees are Aspens and cottonwoods. However, there are other hardy types that could be considered for landscapes or as windbreakers.

Bur Oak (*Quercus macrocarpa*) is native to the Black Hills area of Wyoming

and will grow well anywhere in the state. This shade tree will take several years to establish, but after that it will develop into a broad, maturing tree with a massive trunk and stout branches. This oak is durable, often surviving for several human life spans, and can be planted to celebrate landmark events like the birth of a child, a marriage, or a new home. The mature height will be 60 feet with a width of 40 feet.

Bigtooth Maple (*Acer granidentatum*), native to far western Wyoming, is drought tolerant and performs well in high-alkaline soils. Ecologists believe that this western maple is the equivalent of the sugar maple found in the eastern U.S. Its fall colors range from orange to bright red. It can be trained as a single tree or allowed to have multiple trunks. The mature height is 30 feet, and the width is 20 feet.

Ponderosa Pine (*Pinus ponderosa*) is found through-



The drought-tolerant Bigtooth Maple performs well in Wyoming soils.

out Wyoming on the mid to lower mountain slopes. It is tolerant of windy, dry areas and matures into a large, open pine with long, medium-green needles. The bark ages into a cinnamon color. The tree itself produces a woody smell commonly associated with forests. Many of these pines are more than 500 years old. They mature to a height of 70

feet and a width of 30 feet.

Western River Birch (*Betula occidentalis*) is a clump-forming tree/shrub found along riparian areas. It grows very well in maintained landscapes. What is striking about this tree is the brownish-red to cherry-colored bark it displays in the winter. It is more resistant to borer (insect) damage than the European

variety. This birch tolerates shade very well and grows to a mature height of 25 feet and a width of 15 feet.

There are several other species of native trees and shrubs to choose from in planning landscape designs. Further information can be obtained by contacting a county Cooperative Extension Service office or a local nursery.

Discovering brown gold in the backyard

By Hudson Hill,
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Lincoln County Cooperative
Extension Service

The outlook of livestock owners and the way they manage and process manure determines whether the barnyard leftovers become a valuable resource or a management problem.

The positive aspects of adding manure to soils are numerous. It is an excellent fertilizer containing nitrogen, phosphorous, and potassium. Usually the nitrogen in manure will be released slowly as the plant material breaks down in the dirt.

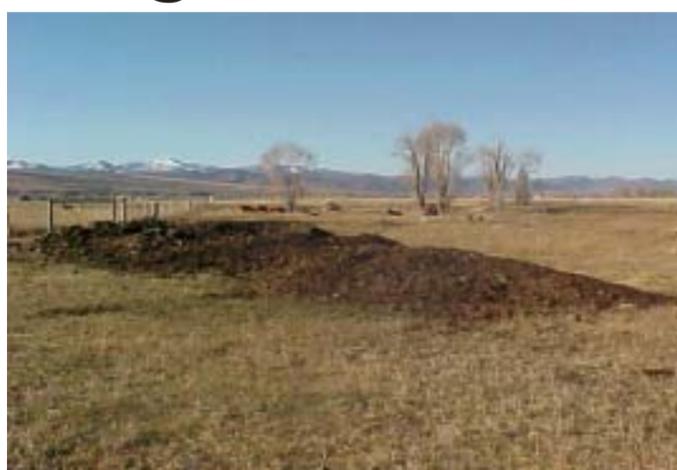
In addition, manure is a wonderful soil amendment, adding organic matter that will increase the land's ability to hold water. Manure brings nutrients such as zinc, iron, sulfur, and boron to the soil. It also makes a good food source for bacteria, fungi, and worms that recycle the earth and add to its physical properties.

The goal for landowners considering manure-management strategies should be to improve soil quality, avoid pollution, and protect the productivity of vegetative material.

When applying manure to a landscape, consistency is the key. Soil tests and nutrient analysis should be done on manure to determine when, where, and how much to use.

The majority of livestock owners use one of two management systems. The first is to allow animals to graze full time. In this system the manure is not collected or treated but needs some type of cultivation process to incorporate it into the soil to help with its decomposition.

The second system is a confined one in which manure is stored and then mechanically applied on cropland. With this method the manure is either stockpiled for use in the future, composted to be applied at a later date, or removed and spread daily.



In planning a management strategy, these four items need to be considered:

- **Storage:** An average 1,000-pound horse will produce 9 tons of manure a year. Is enough room available to store this amount? Will the storage facility be environmentally safe from water runoff, filtration, and other problems?
- **Equipment:** How will the material get into the storage facility and then into the field?
- **Time and ability:** Will the storage and application pro-

cess in the strategy actually be accomplished?

- **Funds available:** How much will the management plan and facility cost?

Disadvantages

Fresh manure may have excessive nitrogen that will restrict plant growth. Manure may have high levels of ammonia that could burn vegetation. Salt levels in manure can sometimes be high enough to cause damage to plant roots. Do not use the substance on salt-sensitive crops without testing it for salt content first.

Manure may contain weed seeds that are still viable. There is also a risk of disease organisms being carried in it. Because of these negatives, there is a trend for livestock owners to compost manure.

Composting Manure

Composting may be the best way to utilize manure. It reduces the bulk, making it lighter and easier to store and apply. Weed seeds and pathogens can be killed in the composting process, in which a temperature of 145 degrees is required, if the pile is turned and all the contents are involved.

Compost has fewer odors, and its nitrogen is more stable. The procedure speeds up the breakdown of materials that naturally takes place in the soil by creating perfect conditions for the microorganisms to work faster, thus creating a better product for the dirt by developing a more usable soil amendment.



By Karen L. Panter,
University of Wyoming
Cooperative Extension Service

Horticulture offers many things to Wyoming such as ornamental flowers, trees and shrubs, and fresh produce. It also provides non-traditional, alternative crops that producers of agricultural goods may want to explore.

One of the myths about Wyoming is that the climate is simply too harsh to grow many horticultural crops. Producers may not be able to grow much sweet corn, watermelon, okra, or other warm-season crops, but they can certainly raise cool-season plants.

Vegetables

High levels of light and cool nights are conducive to growing all sorts of vegetables. Radishes, lettuce, spinach, peas, beets, broccoli, cabbage,



Thinking About Alternative Crops?

and even green onions can flourish in the state's short summers. They can be cultivated in plastic-mulched rows using drip irrigation, but other methods are also used commercially.

Fruits

Grapes are found in Sheridan and Goshen counties, and they can probably be grown in other warmer areas of Wyoming as well. Raspberries can thrive and maybe even strawberries at lower elevations. Other berries to consider include serviceberries, elderberries, currants, and gooseberries. These are perennial crops that will be in production for many years and so require some up-front planning and thought. They can be placed in rows or plots and all require manual harvesting.

Herbs

Many culinary herbs can be grown with little fuss in Wyoming's climate. The easiest types are those cultivated for their leaves (basil, chives, or mint for example). The toughest are those nurtured for their seeds (caraway, dill, anise, etc.). Usually herbs are planted from seeds although transplants can be used as well. Planting in rows and using drip irrigation and mulch is common. Most herbs can be sold fresh at nearby farmer's markets. Many can be dried and preserved as well and then sold farther from the field.

Annual herbs or non-winter perennials that can be raised include anise, basil, coriander (cilantro), dill, marjoram, oregano, rosemary, sage, and summer savory. Biennials, which need two growing seasons, include caraway and parsley. Perennials that will produce for several years include chives, mint, winter savory, tarragon, and thyme.

Field-Cut Flowers

As a specialty within Wyoming, there are literally dozens of annual and perennial flowering crops that can be developed for fresh market sales or for drying and preserving. Usually reared in rows

with drip irrigation and plastic mulch, specific varieties have been developed for this type of production. Most are grown from seeds. The producer can buy seeds and start them on their own or purchase seedlings and then transplant them outdoors. The list of possible plant materials is enormous.

A few of the many annuals that can be grown in the field for cut flowers include ageratum (flossflower – fresh or dry), snapdragons (fresh), calendula (fresh), celosia (cockscomb – fresh or dry), gomphrena (globe amaranth – fresh or dry), lavatera (mallow – fresh), statice (fresh or dry), and poppies (fresh).

Some perennials to try include yarrow (several species – fresh or dry), butterfly weed (fresh), delphinium (several species – fresh), baby's breath (fresh or dry), goldenrod (several hybrids – fresh), speedwell (several species – fresh), and culver's root (fresh). All these perennials and dozens of others are hardy in Wyoming.

Woody Plants

Often many types of woody plants can be grown in the field for a year or two and then sold to local consumers or at farmer's markets. This is a highly competitive area of horticulture but could provide niche types of plant materials resilient in Wyoming that may be hard to find otherwise. Most woody plants are brought in from huge nurseries in other states, and the plant material may or may not be acclimated to the state.

There are many different methods of producing woody plants: in rows, in the ground, in containers, in plots, using overhead sprinklers, using drip irrigation, etc. Special planting methods used include grow bags or pots in other pots. Starter materials should be purchased with bare roots and then planted outdoors for continued growth. This type of specialty crop offers more long-term possibilities than others and requires planning far in advance.

Greenhouse Crops

There is considerable interest in greenhouse crop production in Wyoming. The high solar radiation levels in the winter and summer plus the dry air make growing plants in greenhouses very possible. Many of them – everything from tomatoes to tulips – can be raised this way, but greenhouses require quite a bit of capital up front. Starting a new greenhouse requires researching different structural types, environmental controls, crops to be grown, and how and where the produce will be sold. Successful greenhouse operations are everywhere, though, and can be highly rewarding.

High Tunnels

These are unheated "greenhouses" just tall enough to stand in that are used as "season extenders" for growing vegetables, herbs, cut flowers, fruits, or almost any type of horticultural crop. They



Interest in greenhouse crop production in Wyoming is growing.

have no active heating or cooling system, so they are less expensive to put up and operate than greenhouses. However, winter production in them is not possible.

Other Things to Think About

In deciding whether to try producing alternative horticultural crops, there are underlying principles that need to be considered. First, is appropriate land available? The soil should be good quality, not salty, and not totally clay. Sec-

ond, is there water available? This is the lifeblood of any horticultural operation and should be given top priority. Water *must* be low in salts, particulates, and sodium. The first question to ask a new horticultural crop producer is "Have you had the water tested for suitability for use on horticultural crops?" Water quality can easily make or break an operation.

Third, where and how will the crops be sold? Local farmer's markets are rapidly becoming effective outlets. Many horticultural crops are highly perishable and don't ship well. These types of crops can be sold directly to consumers via farmer's markets or right from a producer's door.

Fourth, are legal requirements being met? Local building and zoning codes may dictate what can and cannot be done with certain property, particularly if it is near a city. Always check with local au-

thorities before putting up high tunnels, greenhouses, or other structures. Also, remember that pesticide application is governed by state and federal law.

Many producers are opting to raise organic foodstuffs. Organic farming takes a lot of work, recordkeeping, and supervision. Other producers are choosing pesticide-free methods. These systems are not organic but do allow more options for fertilization, culturing, and insect and disease management.

Delphiniums are perennials that can be grown in fields for cut flowers.



Fall and winter landscape planning can lead to new selections



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The late fall and winter months are the perfect times for amateur as well as avid gardeners to do the planning necessary for the growing season that will soon arrive. No matter how big or small a garden area is, landscaping is always a work in progress. Some plants outgrow their space, some plants unfortunately die, and there is an unending supply of new plants to try.

Whether property owners are starting from scratch or enhancing an existing landscape, they should keep a list of favorite plants on hand. They should also continually revise the list by adding or removing plant names once the varieties have been tried. It is important to involve other family or staff members by asking for suggestions in developing a list. Due to a lack of money or time, gardeners are often

prevented from planting everything they would like to grow in any one season.

Because most of Wyoming is located on a high plains desert, water conservation in gardens has become a focus in plant recommendation and selection. There are many garden plants that will not only survive but also thrive one or two years after their initial establishment in garden locations with little or no supplemental water. However, a gardener shouldn't eliminate or leave out traditional plants that may need additional water to develop because the location might have a microclimate area in the landscape suited for their success. If help is needed in developing a suitable



list of plants, landowners can contact a local Cooperative Extension Service office, shop at local garden centers, spend a day at a botanical garden, view other green areas, or check out landscaping books at local libraries. A landscaper shouldn't worry if there

is not enough room to grow everything this year – there is always next year.

Once the plant list is in place, a map of the property can begin to take shape. Ex-



isting buildings, structures, plants, and features of the land can be drawn on paper. It is important to note the four directions, sunny and shady areas, the prevailing wind direction, and views that can either be enhanced or hidden. The next step is to mark locations for new plantings. If the plan is to develop a xeriscape, one should keep in mind that removing turf is an important step. The map should include notations indicating where moist and dry areas are located so that microclimates can be included.

Once the general shape of a new bed is sketched, it might be wise to use a separate sheet to enlarge the ideas on paper. Starting with the focal point for planting, a gardener should first draw in specific locations for taller plants and then work

toward the edges of the area and the front of the bed. Shorter plants can then be added with their blooming seasons mingled to achieve a continuous series of blossoms throughout the entire bed.

A mixture of fine-textured plants alongside coarser ones adds interest to a garden and keeps a viewer's eye moving through the area looking for new and varied points. The use of similarly shaped and softer textures can create a calming effect. Fine-textured, smaller-leaved plants close to a structure and coarser-leaved plants used at a distance create the look of a larger landscape. Colors can also be used to form a space that appears vast or brings the eye in for a cozier look. When dark colors are used at a distance from buildings and light colors are used close, the visual effect of a larger area is developed. Dark colors close together can create an intimate conversation space.



Flower sizes and shapes can be mixed or kept similar. The use of tall, spiky flowers next to daisy-type flowers or round-mound-forming flowers can create a visually interesting bed that will catch people's eyes for a longer period of time. The use of spike-shaped flowers in a mass will give a more energetic feel to a garden, and the use of small, round-mound-forming plants will soften the



look and lend a more relaxed feeling to an area. Large coarse flowers used at a distance foster a look of enormity, and small, even tiny flowers used up close can add to the illusion of a large space.

For visual impact one can use mass groupings of several of the same plants together in order to create a large splash of color in one particular area of the garden. Another option is to place large groupings side by side to produce visual interest. This will definitely entice passers-by to look twice at a newly enhanced landscape.

SURVEY

Completing this survey qualifies you to win a \$100 savings bond from the UW Cooperative Extension Service. Results of the survey will assist the Profitable and Sustainable Agriculture Initiative Team and others within the Cooperative Extension system to develop educational programs that better meet the needs of Wyoming citizens. We appreciate your time spent in completing the survey. They will be kept confidential.

The names of five individuals who successfully complete this entire survey and submit it to the Wyoming Cooperative Extension Service will be randomly drawn early in January 2005. These people will each receive a \$100 savings bond by mail.

- How many years have you lived in Wyoming?
Less than 21 / 21-30 / 31-40 / 41-50 / 51-60 / 61-70 / More than 70
- Please indicate your current age:
25-34 / 35-44 / 45-49 / 50-54 / 55-59 / 60-64 / 65-69 / 70 or older
- What is your gender? Male / Female
- Please indicate your highest level of formal education:
Grade School / High School / 2yr Degree / 4yr Degree / MS / PhD
- In which counties of Wyoming do you currently operate? (circle all that apply)
Albany / Big Horn / Campbell / Carbon / Converse / Crook / Fremont / Goshen / Hot Springs / Johnson / Laramie / Lincoln / Natrona / Niobrara / Park / Platte / Sheridan / Sublette / Sweetwater / Teton / Uinta / Washakie / Weston
- What best describes your operation's current business structure?
Sole proprietor / Partnership / Limited Liability Company / Family Corporation / Other
- Please describe your residential situation: (circle all that apply)
Home Owner / Renter / In Town / 1-10 acres / 11-40 acres / more than 40 acres
- What type of agricultural activities do you engage in? (circle all that apply)
Gardening for Home Use / Farmer's Market Production / Commercial Livestock / Commercial Crops / Other-describe _____
- Please estimate average annual sales (gross receipts) from your operation:
Less than \$1,000 / \$1,000 to \$9,999 / \$10,000 to \$24,999 / \$25,000 to \$50,000 / More than \$50,000 / Other-describe _____
- How do you prefer to receive your information on agriculture? (circle all that apply)
Newspapers / Radio / Television / Newsletters / Magazines / Internet / Local Meetings / Regional Conferences /
- What types of information on agriculture do you receive? (circle all that apply)
Plant Care / Gardening Tips / Crop Production / Livestock Production / Mixed Information / Other-describe _____
- How optimistic are you regarding your future in agriculture?
Very Pessimistic / Somewhat Pessimistic / Neutral / Optimistic / Very Optimistic
- Name and address (required to be considered for the drawing):
Name: _____
Address: _____

Thank you for completing this survey!

You may mail the completed survey to: Newspaper Survey, Dept. 3354, 1000 E. University Ave. Laramie, Wyoming, 82071-3354.
OR you may complete the survey online at: www.uwyo.edu/CES/Forms/on-line_forms_main.htm