

Cover Crops for the Home Gardener

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Judy Halm

If you have a small space in your flower beds where no flowers are planted, or perhaps a small or large bare area in your garden, you can benefit from cover crops. A cover crop is simply a thick growth of plants that cover the soil. Although many plants can be grown to cover the soil – including weeds – the most beneficial are certain varieties of legumes and grasses. When a cover crop is tilled into the soil at some point in its growing life, it acts as a green manure.

Benefits of Cover Crops

Cover crops/green manures have numerous benefits for your garden. They can enhance the biological activity in your soil; add organic matter; increase the availability of existing nutrients; keep nutrients from leaching away because of rainfall or irrigation; reduce the need for nitrogen fertilizer (legume crops); improve soil tilth; reduce weeds; prevent erosion by wind or water; and reduce disease and crop pests. Most cover crop seeds are inexpensive, and a few ounces will cover a large area.

Grasses

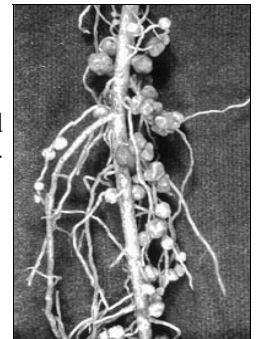
Grasses used as cover crops include cereal grains like wheat, barley, oats, Sudan grass, bromegrass and rye. Buckwheat, a relative of rhubarb, is a quick-growing plant used to choke out weeds. Bees also love buckwheat blossoms. Many grains are annuals, so do not survive Montana's harsh winters.

However, a grass planted in the fall can produce enough biomass that will provide cover for the soil over

the winter months if left standing; when tilled into the soil in the spring it will add organic matter to the soil. Grass or cereal grain cover crops can help retain nitrogen in the system by using residual soil nitrogen that could be lost to leaching. The nitrogen is incorporated into the tissue of the cover crop. Then, when living cover crops are tilled under, soil microbes break down the stems and roots, releasing nutrients for use by other plants.

Legumes

Legume crops include peas, beans, soybeans, clover, alfalfa, vetch and lupines. *Rhizobium* bacteria work in combination with the legume cover crops to "fix" significant amounts of nitrogen from the atmosphere that the legume can then use for the growth of its own tissues. When the green legume cover crop is incorporated into the soil, microorganisms decompose the crop residue, releasing nitrogen for use by subsequent crops.



Nodules of *Rhizobium* bacteria on roots

Nutrient Cycling

Cover crops can improve nutrient cycling within the plant-soil system. Buckwheat increases the phosphorous level in soils by accumulating phosphorous in its tissues, as do some legumes. Vetches can increase levels of calcium and sulfur.

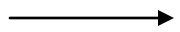
The roots of many cover crops, particularly legumes such as yellow or white sweet clover and alfalfa, travel deep into the soil where they can loosen the soil and break up compaction. Deep roots allow many cover crops to bring up nutrients from the subsoil, where more shallow-rooted plants can use them. Legume blossoms are also favorites of polli-



Buckwheat used as a cover crop



Fagopyrum esculentum
Buckwheat



Cover Crops for the Home Gardener - *continued*

nators.

Growing Cover Crops

Before planting cover crops, you must choose the right plants for your needs. To smother weeds, choose a quick-growing cover crop such as buckwheat. To supply nitrogen, choose a legume such as vetch or clover. For winter cover, you can late-summer plant a combination of hairy vetch (a legume) and winter rye (a cereal grain). Both can be turned under as soon as the soil is workable in the spring, with the hairy vetch providing nitrogen and the winter rye providing some weed suppression. Be sure to wait three to four weeks after tilling winter rye into the soil before you plant garden or flower seeds, as the rye contain allelopathic chemicals which inhibit seedling formation.

When planting legumes for nitrogen fixation, try to let the plants grow for an entire season to get the full benefit of the nitrogen fixation. Plant in the spring and till under the next spring, or plant in the fall and turn in to the soil the next fall. The crop may be mowed several times while it is growing, and the clippings used as mulch or put in your compost bin.



Trifolium repens, White Dutch clover

Most legumes benefit from inoculation by a specific species of *Rhizobium* bacteria before the seeds are planted. The bacteria

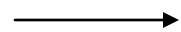
form small nodules on the roots of legumes, where nitrogen is fixed. Be sure to purchase the correct inoculant for the legume you plan to plant.

Turn under other cover crops before they form seeds; several varieties can self-seed and fill your garden with plants where you may not want them. Allow several weeks to pass after tilling in cover crops before planting desirable seeds. The decomposing plant material can reduce the amount of nitrogen available to new seedlings.

If you don't want to take garden or flower bed area out of production to plant cover crops, you can treat cover crops as living mulches. Oats, wheat or barley can be planted under taller crops like corn. Plant them later in the season so they don't go to seed. White Dutch clover can be planted among garden crops like squash or cabbages or in flower beds under tall perennial flowers. The clover can be trimmed down by hand or with a string trimmer, and the trimmings used as mulch; the clover can then be hand-turned into the soil next spring to provide nitrogen.

The following tables provide some useful legumes and grasses for cover crops:

Legume	Scientific Name	Comments
Alfalfa	<i>Medicago sativa</i>	Perennial; great nitrogen fixer if grown for an entire year before turning under. Can be difficult to remove if allowed to grow for several years.
Beans, soy	<i>Glycine max</i>	Annual; need warm weather for good growth
Clover, crimson	<i>Trifolium incarnatum</i>	Annual; sow in spring and turn under in fall; attractive blossoms
Clover, red	<i>Trifolium pretense</i>	Short-lived perennial; "Mammoth" variety is fast growing; accumulates phosphorous; plant in early spring and turn under in the fall
Clover, Dutch white	<i>Trifolium repens</i>	Perennial; plant in spring or summer and turn under in the fall or next spring; shorter than other clovers; tolerates foot traffic; great living mulch
Peas, field	<i>Pisum sativum</i>	Annual; combine with oats or rye; plant in spring and turn under before pods fill out
Lupine	<i>Lupinus albus</i> and others	Annual; plant in spring and till into the soil in the summer before pods form
Sweet clover "Hubam"	<i>Melilotus alba</i>	Annual; tall, good biomass and nitrogen producer; sow in early spring, till in fall
Sweet clover, white or yellow	<i>Melilotus</i> spp.	Biennial; tall, good nitrogen and biomass producer; deep roots loosen soil; sow in spring, till in fall
Vetch, hairy	<i>Vicia villosa</i>	Biennial; hardy; good winter cover crop in combination with cereal grain; good nitrogen fixer; sow in spring or fall and till under the following fall or spring



Cover Crops for the Home Gardener - *continued*

Grass/Grain/Other	Scientific Name	Comments
Barley	<i>Hordeum vulgare</i>	Annual; sow in spring, till in summer; use northern varieties
Bromegrass	<i>Bromus inermis</i>	Perennial; hardy, easy to grow
Buckwheat	<i>Fagopyrum esculentum</i>	Frost-sensitive annual; grows quickly; turn under in 5 to 6 weeks; good smother crop for weeds
Oats	<i>Avena sativa</i>	Frost-sensitive annual; grows quickly; mix with slower growing legumes for quick cover; plant in spring or summer and turn under before seeds form
Rye, winter	<i>Secale cereale</i>	Annual; hardy winter cover crop combined with legumes; sow in fall and turn under in spring 3 to 4 weeks before planting other seeds
Ryegrass, annual Italian	<i>Lolium multiflorum</i>	Fast growing annual; plant in spring or summer, turn under before plants bloom or form seeds
Sudan-grass (grain sorghum)	<i>Sorghum sudanense</i>	Annual; very tall; likes heat; smothers weeds; sow in spring or summer, turn under when plants are 6 inches tall
Wheat	<i>Triticum aestivum</i>	Annual; plant spring varieties in the spring, turn under before seeds form; plant winter varieties in fall and turn under in spring

Seeds can be purchased locally from seed stores, garden centers or farm and ranch supply stores. Several online sources are available for seeds, as well. Be aware that some perennial species such as hairy vetch can be difficult to get rid of especially if allowed to grow for more than one season.

If you have questions about cover crops contact your local County Extension Agent; he/she will be familiar with the varieties that work best in your area.

References:

Secrets to Great Soil, Elizabeth Stell. (1998). Storey's Gardening Skills Illustrated

Building Soils for Better Crops: Sustainable Soil Management, 3rd ed., Fred Magdoff and Harold van Es. (2009). Sustainable Agriculture Research and Education (SARE)

Gardening Projects, Tips and Hints: Golf Bag Tool Caddy

Judy Halm

If you get tired of juggling multiple garden tools as you go about your gardening chores, consider using an old golf bag as a tool transporter. It can hold long-handled implements like hoes, shovels and rakes, and short-handled tools can be hung on the outside. Most golf bags have zippered compartments which can be used as storage for gloves, small tools and water bottles. Add a pull-type golf cart to hold the bag, and you will be set for any gardening chore!

If you are not a golfer, you can check the classified ads in your local newspaper, or second-hand or pawn shops for used golfing equipment.



James Wojcik, <http://www.realsimple.com>



Indoor Winter Herb Gardening

Ann Prunuske

Alas, the golden days of summer have slipped away. But there is no need to bid farewell to the intoxicating aromas and flavors of fresh herbs. With a modicum of effort, many favorite herbs will thrive indoors. Fragrant and richly seasoned soup or lasagna served on a chilly winter evening evoke sweet memories of last summer and inspire ambitious plans for the upcoming spring.

A number of hardy herbs will grow indoors: oregano, chives, rosemary, thyme, sage, parsley and mint are among the easiest to grow. Bay laurel is a delightful addition that grows well in indirect light. Annual herbs such as basil, dill and cilantro can be tricky, requiring intense light levels. As they don't regenerate new growth after picking, a new crop must be started every few weeks. Three pots of these plants, each at a different stage (newly seeded, intermediate growth, and ready for harvest) should do the trick.



If you have grown some of your favorites in pots out on your deck or porch over the summer and brought them in before frost, there are a few things to bear in mind: the humidity of your house is less than what plants are accustomed to outside, and the plants will be exposed to fewer hours of light. Consider easing the shock of lower light levels inside by placing your outside plants in shadier areas for a few weeks before moving them indoors. This is especially important for rosemary plants which can die suddenly in the middle of winter because the weaker light does not enable the plant to make enough food – it starves to death.

Most herbs adore sunlight, requiring a minimum of 6 hours per day. In winter months the intensity of the light can be less than one tenth of summer's outdoor light. That brightly sunny south window is deceptive. In winter 12-16 hours of supplemental light is recommend-



ed. Available light can be maximized through the use of reflective light from a wall or mirror, but full-spectrum grow lights or high-intensity discharge (HID) lights are strongly recommended. Without sufficient light, plants will "stretch," getting elongated and thin; they will have smaller leaves and less intense aroma.

After light, the soil is the most important factor in growing healthy herbs. Herbs require excellent drainage, particularly in the winter months when their transpiration rates are lowest. A lightweight, compost-based potting mix, with added coarse sand or perlite, will provide drainage without sacrificing nutrients. Mulch container herbs with aquarium gravel or coarse sand to avoid fungus gnat infestation. Sage, which prefers a more acidic soil, will benefit from a mulch of sphagnum peat moss or coffee grounds. Most herbs do well in soils of pH 6 to 7.



Water is critical to plants, but it is important not to over-water. Air is required by root hairs and if air pockets in the soil are clogged with water, root-rot or other fungal disease may thrive. Water only when soil is dry a half an inch below the surface. In general, water indoor winter herbs less often and more thoroughly. Atmospheric moisture is also important to herbs. Grouping herbs together on trays filled with moist pebbles, aquarium gravel or perlite will help create a humid environment.

Last, though herbs generally require no fertilizer outdoors in a garden setting where they are confined to a pot, use liquid fertilizer or organic fish emulsion every two weeks. As plant growth slows down, reduce fertilizer amount to a quarter of normal until mid-March.

Tips for Success:

- ☼ With the exception of basil and cilantro, start with herb plants. Seeds take too much time for many herb plants to mature and be usable.
- ☼ Remove all flowers and flower buds to keep plants growing.
- ☼ Pinch back branching herbs such as rosemary to keep plants shrubby, though never remove more than a third of the plant.
- ☼ Be alert for drastic temperature changes that are stressful to an herb and may weaken it, causing susceptibility to disease or insects. Do not place plants near a frequently opened door, wood stove, or even a single-



Indoor Winter Herb Gardening - *continued*



paned window. Good air circulation is important, as long as temperatures stay relatively constant.

- ⊗ Conrad Richter of Richter's Herbs suggests that digging up garden parsley and planting it in a pot large enough to accommodate its taproot, rather than seeding it indoors, will produce best results.

Howard, D. (2010, October 11). Diggin' it - How to grow herbs indoors during winter. *The Christian Science Monitor*. Retrieved from <http://www.csmonitor.com/The-Culture/Gardening/diggin-it/2010/1011/How-to-grow-herbs-indoors-during-winter>

References:

Bremness, L. (1988). *The complete book of herbs: A practical guide to growing and using herbs*. New York, NY: Vicking Studio Books.

Richter, C. (1997, November/December). Growing Herbs Indoors. *National Gardening Magazine*. Retrieved from <http://richters.com/show.cgi?page=MagazineRack/Articles/>

Recipe of the Month

Sheena Wilson

Farmer's Markets are behind us, gardens are tucked in for the winter. Fortunately for those of us in northern climes, our local grocers are able to keep us stocked in healthy vegetables while we wait for next season's local bounty. Some of those vegetables are especially suited to soups and stews that offer a delicious remedy for winter chills.

Leeks and parsnips are two of my favorites. Their combined flavor is sublime and the aroma of this soup will instantly raise the "coziness" factor in your kitchen. It's adapted from a traditional Scottish recipe for Cock – a – Leekie (really). Its five ingredients need no embellishment, combining in the very definition of comfort food. I hope you'll try it out and if you have any questions about the preparation or recipe, just email me at:

wiljan717@msn.com



Leeks



Parsnips

My measurements are not precise...this sort of soup (like many others) requires no exactness and "more or less" is absolutely OK.

Chop the meat from one roasted chicken (the rotisserie variety at your supermarket work great). If you're not in the habit of making big pots of soup, use just half the chicken and half of the ingredients below.

3 or 4 cups of sliced leeks (use only the white and paler green part)

3 or 4 cups of peeled and sliced parsnips

2-3 pounds of Yukon gold potatoes, peeled and cut in chunks

Enough chicken stock (broth) to cover it all. (If you have time, dump ALL the leftover bits of the chicken carcass in a pot with enough water to cover and simmer for an hour or so, strain, cool, remove excess fat and use it along with store bought broth)

"Sweat" or steam the leeks and parsnips in a wee bit of butter or oil in your covered soup kettle on low heat until the leeks are translucent and soft. Add the chicken and stock and bring to a simmer, cook for an hour or so before adding potatoes. Return to simmer and cook just until the potatoes are cooked to your preference.

The soup is nourishing, fragrant, sweet and perfect for sharing. I hope you enjoy it.

Sixth Ward Edible Forest

Maureen Kiely

An exciting, visionary community garden project is taking shape in Helena's historic 6th Ward. The City's Parks and Recreation Department, along with Helena Community Gardens, Helena Food Share, Inside Edge Designs, and local volunteers, will transform 1.1 acres of a run-down, vacant park into Montana's first "edible forest garden" park. The renovated park will provide Helena's residents with a beautiful space to meet, relax, play, grow food, and enjoy the bounty from numerous fruit-producing trees and shrubs.

What is an edible forest garden? It's a garden that mimics a woodland or forest ecosystem but substitutes mostly edible trees, shrubs, perennials and annuals. Fruit and nut trees provide the upper (canopy) layer. Underneath the trees are berry shrubs and other edible plants. Companion plants are selected to attract bees and other beneficial insects, to repel pests, and to help improve the soil. For the 6th Ward garden, a list of possible trees includes European pear, dwarf and standard apple varieties, plum, hazelnut, and Nanking cherry. There is



10-year-old edible forest garden in Holyoke, MA. Jonathan Bates. Photo: Finger Lakes Permaculture Institute

for Helena Food Share, is pleased that the 6th Ward garden park will help give her clients access to fresh, healthy, locally-grown food. Helena Food Share serves as many as 1,500 households each month, and 30 percent of its clients are children.

The park may also feature an "indigenous heritage patch" that contains medicinal and cultural plants used by various Native American tribes in the west; and a "pickable playground" where children can experience the joys of eating fruit or berries picked right off the plant.

What will this forest garden park mean for the city of Helena?

Once completed, the park will meet several goals:

- Relaxation, play, community – the park will be a beautiful setting for anyone wanting to commune with nature.
- Education – the park will help to demonstrate how anyone with a plot of land can grow their own nutritious food at a relatively low cost.

- Habitat for birds, and food sources for beneficial insects – the trees, shrubs and companion plants in the park will provide nesting sites for birds; the flowering trees, shrubs and companion plants will attract bees and other pollinating insects.
- Research – Once the park is established, the City Arborist will be investigating whether trees and shrubs grown within the forest garden's polyculture are healthier than those grown in conventional monoculture plots.

When will the park be completed? There are four phases needed to successfully construct and manage the edible forest garden park:

1. Fundraising
2. Planning
3. Construction
4. Maintenance and management

A conceptual design for the park was developed in Summer/Autumn of 2013. Now, the Parks Department and its partners are raising funds to develop a comprehensive plan for park construction and management. Once the plan is completed, the Parks Department will begin preparing the soil for planting in Autumn 2014. The hope is to have all construction and planting completed by Spring 2015.

How can I help? The Parks Department has applied for an Urban Forestry grant from the Montana Department of Natural Resources and Conservation. Even if awarded, these grant funds will not cover all of the costs needed to construct and maintain the park.

1. **Make a donation:** If you would like to make a tax-deductible donation for the park, write a check to the "City of Helena," with a note, "edible forest garden." Send the check to:

Amy Teegarden, Parks and Recreation Director
City of Helena
316 North Park Avenue
Helena, MT 59623

Include your e-mail address if you would like to be kept informed about the park's progress. If you don't have an e-mail, you can call the Parks Department for updates (406-447-8462).

2. **Volunteer:** Once the construction phase begins, there will be many opportunities to volunteer. Preparation and amendment of the soil, construction of community garden plots, and planting vegetation are some examples of the help that will be needed.

For more information about this exciting effort, please contact Amy Teegarden, Parks and Recreation Director: ateegarden@helenamt.gov

Plant Profile: Amaryllis - Put Some Color Into Your Holidays!

Joy Lewis

This time of year, when all color has vanished from our landscapes, we are often tempted by “flowering bulbs” in our gardening catalogues. Big box stores also lure us with their displays of boxed, ready-to-go bulb packages. And what’s not to like about the exotic and colorful flowers that adorn these boxes? Boxed bulbs are usually cheap and worry-free, and only require water.

An especially colorful and exotic species with trumpet-like flowers is the *Hippeastrum* hybrid or more commonly known as the Amaryllis or Barbados Lily. They are great bulbs to purchase and easy to grow. Boxed Amaryllis bulbs typically have been treated to flower only once. Fortunately, untreated bulbs are available for purchase and will produce flowers for 2 – 5 years if they are fertilized and well taken care of.

If you purchase a treated Amaryllis kit just follow the directions supplied in the kit for planting. Put the pot in a well-lit area and keep the soil mixture slightly moist, in a cool spot – 65-70 degrees, and do not overwater. Rotate pot once or twice a week and plan to support the tall flowering stem with a stake. After the plant has finished blooming cut the stalk to two inches above the bulb and enjoy the green strap-like leaves or discard.



Untreated Amaryllis bulbs should be planted in loam-based soil if you plan to enjoy them for some years. A good mixture for planting bulbs includes 2 parts loamy garden soil mixed with 1 part compost or leaf mold. If your garden

soil has any hint of clay in it, purchase a bag of garden soil. Bulbs need light, aerated soil to grow in. Add one part perlite to enhance the aeration and water control in the soil. Perlite, amorphous volcanic glass, is a soil amendment that helps prevent soil compaction and improves drainage and aeration in containers to promote strong root development.

Choose a pot that is twice the size of the bulb, generally about 5 inches in diameter and 8 – 10 inches deep. Use sharp rocks or broken pottery pieces to line the bottom, especially if there are no drain holes. Plant your bulb so that the upper half sits above the soil surface. Water thoroughly. Place pot in a warm to-cool, well-lit area. The flowering stem usually arrives before the leaves. Feed weekly or bi-weekly and keep soil moist during the active growth of the bulb. If your Amaryllis is grown under the right conditions, the flowers will open in succession and last several weeks. Wait until flower-

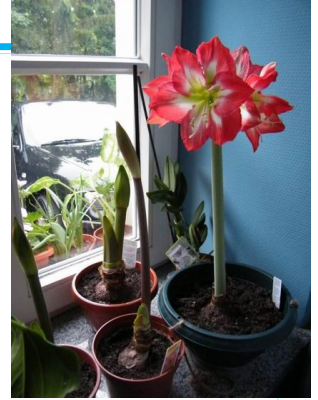
ing has finished and stem has dried, and then cut back. Decrease watering slowly and stop altogether for 6 – 8 weeks. Do not remove leaves. Repot the parent bulb in a new pot or transplant outdoors when any chance of freezing is over. Monitor your bulb throughout the summer and cut back leaves only if they have turned yellow or brown. In the fall, cut back any remaining leaves and repot in new soil mixture and start the process all over again. Some people store their re-potted bulbs in a cool dark spot, delaying their bloom times to coincide with Thanksgiving or the winter Holidays.

Occasionally parent bulbs produce offsets. Pot these beginner bulbs in a rich mixture and wait. In 2-3 years they should produce their own flowers, so unless you crave a different color, there is no need to keep buying more Amaryllis bulbs.

Amaryllis hybrids are fun and easy to grow. Scattered around your house, they provide lively splashes of color especially during those gray and dreary times of the year. Enjoy, and Happy Holidays!

Some problems to watch for:

- * Plant growth appears stunted or flowers turn dark or black, move to a warmer spot (60 – 70 degrees).
- * Leaves pale – too much water.
- * Flowers limp and stem pale – move to cooler spot.
- * Bulbs don’t grow well in 2nd season – failure to adequately fertilize until foliage dies back.
- * Mealy bugs, White waxy spots – wipe off with wet cloth or paper towel.



Gardening Calendar

Connie Geiger

Conditions during each season in your location will determine the actual timing of your garden work. If you have questions regarding the timing of garden activities in your area, please feel free to ask a Master Gardener at HelenaMasterGardeners@hotmail.com.

December

- Check stored flower bulbs, vegetables, fruits for rot and fungus problems. Discard any showing signs of rot. Inspect stored vegetables, fruits and bulbs for any damage. Remove sprouts from potatoes.
- As dry spells occur, check the soil around trees and shrubs and other perennials and water (early in the day).
- Take seed inventory and plan next year's garden. Plan on rotating crops to discourage pests and diseases.

January

- Check storage vegetables and bulbs for mildew and rot, and destroy those affected.
- Reuse natural Christmas trees as a bird feeding station, or as added wind protection for evergreens; or cut limbs to use as winter protection for perennials
- Consult your garden journal and plan for the new growing season
- Plan and construct, or repair, garden projects: hoop houses, tomato cages, fences, gates, cold frames, trellises, benches
- Reapply or redistribute mulches that have blown or been washed away during the winter. Watch for frost heaving of tender perennials and cover if needed
- Replace windbreaks to protect sensitive landscape evergreens
- Moisten root system of stored geraniums (repeat monthly)
- Remember when deicing walkways and driveways to use calcium chloride or potassium chloride products that are less damaging to plants and lawns
- Bring out bulbs from cold storage for "forcing" for early indoor blooms
- Christmas flowering plants like poinsettia and amaryllis need bright light, cooler temps, fertilizing, and reduced watering
- Watch for rodent damage of trees and shrubs. Install mesh, wire or plastic trunk guards as needed
- Brush heavy snow and ice from tree and shrub limbs to prevent later damage. Multistemmed evergreens (arborvitae) can be tied together.
- Wrap tree trunks of young trees, and those with thin bark, to prevent frost cracking during cold sunny days
- Consult garden catalogues and start comparison pricing for Spring seed orders



February

- Check with local nursery and garden stores for seeds and early planting options
- Inventory and check dates of left-over seed packets; sprout a few in a moist paper towel to ensure still viable
- Order new seeds for Spring planting
- Clean, sharpen, and oil garden tools; sand and repaint handles
- Using detergent and mild bleach solution clean old pots and seed trays to prepare for seed starts
- Clean indoor plants; giving them a "shower" helps remove dust that can clog pores or hinder light penetration and can also wash salts from the soil
- Brush heavy snow and ice from tree and shrub limbs to prevent later damage



"There are two seasonal diversions that can ease the bite of any winter. One is the January thaw. The other is the seed catalogues." - Hal Borland

"The flowers of late winter and early spring occupy places in our hearts well out of proportion to their size." - Gertrude S. Wister

Ask the Experts

We all have questions about our gardens, lawns, trees, flowers or other landscape projects from time to time. Ever wish you could ask an expert in the field for answers to your questions? Here's your chance! In each issue of the newsletter we will answer one or more questions posed by our readers. Send in your questions to HelenaMasterGardeners@hotmail.com and we will pass the questions on to our expert panel for answers.



Brent Sarchet, Lewis & Clark County Extension Agent

2013 Bell Pepper Variety Trial Results

Every year the Extension Office does a variety trial of a common vegetable crop. The purpose of the variety trials is to determine which cultivars are best adapted to growing in our climate and will yield the best. The information may aid in variety selection for gardeners, CSA's, and market farms. It may also help them plan for expected yields when having to produce a certain quantity of a vegetable for a given market. Each garden or farm may have different growing conditions and soil fertility that will cause a variation in variety performance and yield. The trial results are meant to be a guide and not a guarantee of performance. This year we evaluated 16 sweet bell pepper varieties. The peppers were planted May 31st. Row covers were used for the first 6 weeks and for a couple of weeks in the fall. A drip irrigation system was used. The peppers were harvested when they began to mature and turn color (red, orange or yellow depending on the variety). At the end of the season all the peppers were picked except those that were less than 2" in diameter and immature.

The first harvest date was July 31st. The last harvest date was September 25th. The first early producer that had the highest yield was Flavorburst that yielded 1 pepper per plant that had an average weight of 3.2 ounces. Flavorburst is a yellow skinned pepper with good flavor. Beaver Dam was the next highest early yielding variety with 1 pepper per plant that had an average weight of 2.6 ounces. Beaver Dam has a chili pepper shape that turns from a light green color to a dark red when mature. When eaten as an immature pepper it has a slight amount of heat, but once it matures it has very little to no heat flavor. The variety that had the highest yield for the season was Yankee Bell with 2 pounds of peppers per plant; the average weight of the peppers was 3.7 ounces. Yankee Bell is a medium sized pepper, oval shaped with good flavor. The pepper that yielded the highest quantity of fruit was Beaver Dam with 15 peppers per plant and an average weight of 1.8 ounces. The variety with the largest fruit was Snapper, 5 ounces. The average plant yield for all the varieties was 1.4 pounds; the average fruit weight was 3.5 ounces, and the average number of fruit per plant was 6.7. Below are a list of the varieties, their seed source and a graph of the results.

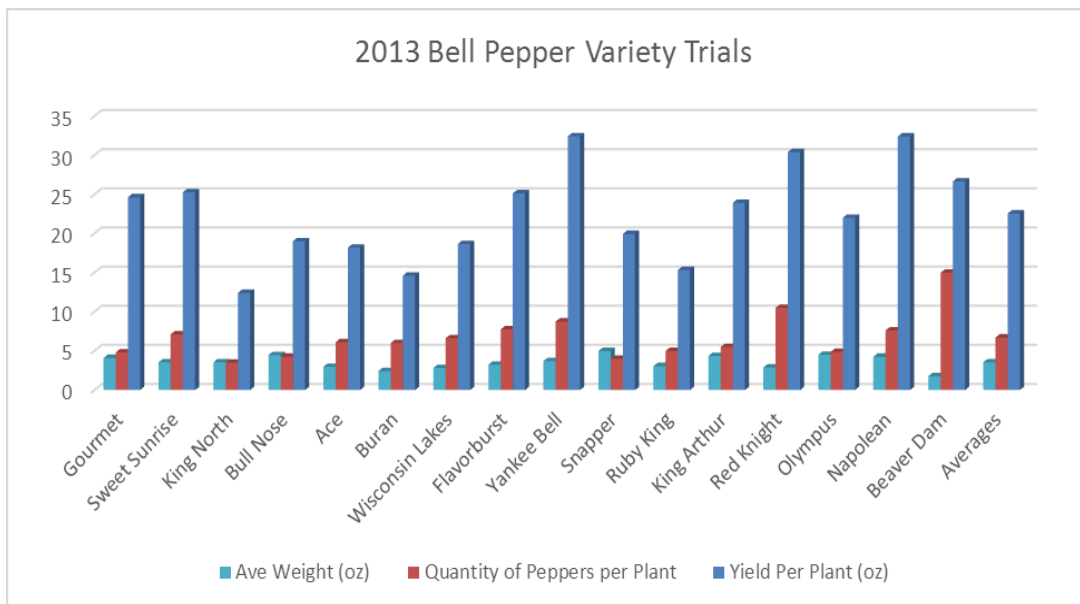
Variety Name	Seed Source	Variety Name	Seed Source
Olympus, hybrid	Johnny's Seeds	Beaver Dam	Seed Savers Exchange
Yankee Bell	Johnny's Seeds	Bull Nose	Seed Savers Exchange
X3R Red Knight, hybrid	Johnny's Seeds	Buran	Seed Savers Exchange
Snapper, hybrid	Johnny's Seeds	Ruby King	Seed Savers Exchange
Ace, hybrid	Johnny's Seeds	Napoleon Sweet	Seed Savers Exchange
Flavorburst, hybrid	Johnny's Seeds	Wisconsin Lakes	Seed Savers Exchange
Gourmet, hybrid	Johnny's Seeds	King of the North	Seed Savers Exchange
King Arthur, hybrid	Johnny's Seeds		
Sweet Sunrise, hybrid	Johnny's Seeds		<i>Graph next page</i> →

Newsletter Contact Information:

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Ask the Experts - *continued*



Event Schedule

Know of an upcoming event related to gardening?

Let us know at [HelenaMasterGardeners@hotmail.com!](mailto:HelenaMasterGardeners@hotmail.com)

Helena Local Workshop—To gather, share, educate and plan with those interested in sustainable agriculture in the community.
 January 17-18, 2014 8:30 am to 6:00 pm
 Conference Room at the Lewis & Clark County Fairgrounds
<https://sites.google.com/site/helenalocalcsa2/workshop>

Level I Master Gardener Class
 Thursday evenings February 27th - April 24th, 2014
 5:30 pm to 8:00 pm
 Extension Office in Helena
 Lewis & Clark County Fairgrounds
 100 W. Custer, Helena MT 447-8346

Spring Private Applicator Training
 Friday, April 25, 2014
 Extension Office in Helena
 Lewis & Clark County Fairgrounds
 100 W. Custer, Helena MT
 447-8346

Fruit Tree Grafting Workshop
 Saturday, April 5, 2014
 Lewis & Clark County Fairgrounds
 100 W. Custer, Helena MT
 447-8346

Newsletter Contributors

- Brent Sarchet
- Judy Halm
- Connie Geiger
- Joy Lewis
- Ann Prunusice
- Terri McCormick
- Maureen Kiely
- Sheena Wilson
- Charlotte Bowen

"From December to March, there are for many of us three gardens - the garden outdoors, the garden of pots and bowls in the house, and the garden of the mind's eye."

- Katherine S. White

"February is merely as long as is needed to pass the time until March."

- Dr. J. R. Stockton

"Every gardener knows that under the cloak of winter lies a miracle ... a seed waiting to sprout, a bulb opening to the light, a bud straining to unfurl. And the anticipation nurtures our dream."

- Barbara Winkler