



A Newsletter for GARDENERS OF ALL LEVELS

By Helena Area Master Gardeners

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If you have questions or comments, or would like to submit an article or tips and hints, contact us at HelenaMasterGardeners@hotmail.com.

Predators, Pollinators, Parasites: Insect Friends in the Garden

Ann Prunuske

"When you kill off the natural enemies of the pests, you inherit their work."

For generations, we have been conditioned to recoil at the sight of a bug in our house or garden – to recoil and grab a bottle of the meanest insecticide we can find. Now, beset with problems arising from the chemical solution to destructive bugs, we are re-discovering how to appreciate the natural balance in nature. Some of those bugs are strong allies of gardeners. So, instead of rushing out to buy chemicals, learn how to identify, attract, and foster Nature's gift of beneficial insects.

Predator insects get rid of pests in our gardens and crop fields, parasites slow the march of leaf eating insects, and pollinators insure the production of fruit from flowers. This added with your own predator presence in the garden and you have quite a strong defense against plant and crop damage.

Pollinators, such as honeybees, fertilize flowers, which increases the productivity of food crops ranging from apples to zucchini. Predators, such as lady beetles and soldier bugs, consume pest insects as food. Parasites use pests as nurseries for their young. On any given day, all three 'P's' are feeding on pests or on flower pollen and nectar in a diversified garden. If you recognize these good bugs, it's easier to appreciate their work and understand why it's best not to use broad-spectrum herbicides.

Beneficials to Know and Love

Ladybugs: Adults range in color from pale yellow to red to black and are often spotted. They are attracted to angelica, tansy and scented geraniums. Larvae look like spiny alligators. Both adults and larvae feed voraciously on small, soft pests such as aphids, mealybugs and spider mites.

Lacewings: The pale green or brown, alligator-like larvae prey on aphids, scale insects, small caterpillars and thrips. Adults have large, finely veined wings and feed mainly on flowers including Queen Anne's lace, wild lettuce, goldenrod and tansy.



Stratford Camera Club

Hover fly larvae: Also known as syrphid flies, these black-and-yellow- and black-and-white-striped flies resemble wasps, but do not have stingers. They are attracted to bee balm, butterfly bush, marigold and members of the daisy family, and are highly effective pollinators. Females lay their eggs in aphid colonies. The greenish-grey larvae that emerge eat aphids in tight places too small for most other insects.

Predators, Pollinators, Parasites—*continued*



True bugs/minute pirate bugs: This is the common name for insects in the Hemiptera order. Members of this order have needle-like beaks for sucking fluids and leathery wings crossed flat over their backs. Immature insects closely resemble adults. While some are garden pests, many others are allies. Assassin, ambush and minute pirate bugs prey on the tomato hornworm, thrips, leafhopper nymphs, corn earworms and a great number of other pests.



Ground beetles: These large, iridescent black beetles hide under rocks and logs during the day and move quickly when disturbed. They live in the soil and eat a variety of pests including slugs, snails, grubs, cutworms and root maggots. They are attracted to perennial groundcovers, logs and stones.



Spiders: Although not insects, spiders are often grouped with them. Some of the best predators in the garden, spiders catch their prey in webs or leap on their prey using silk thread as a dragline. Common garden spiders do not move indoors come fall

and are nonpoisonous.



Aphid midges: Delicate, long-legged adults feed on the honeydew left by aphids. Larvae, which look like tiny orange maggots, voraciously consume aphids.

Tachinid flies: These large, bristly, dark grey flies place their eggs on cutworms, sawflies, stinkbugs and other pests. Adults are attracted to pollen and nectar plants including bee balm, comfrey, rudbeckia and butterfly bush.



Parasitic wasps: Adults of these mostly tiny and non-stinging wasps are attracted to members of the carrot and daisy families, strawberries and clover. Females inject their eggs into or onto pests such as aphids, flies, beetles and many caterpillars. Larvae grow by absorbing nourishment through their skin.

Earthworms: — also not insects — are highly beneficial in gardens. Referred to as ‘nature’s plow’, earthworms aerate and enrich the soil. Worms are highly sensitive to chemical and physical changes, so avoid any synthetic fertilizers, and minimize tillage.

Attracting Beneficials

One cannot assume beneficial insects will show up and live in one’s garden. Research shows that ample flowers not only sustain them, but also allow longer survival and production of more progeny, thus increasing the natural control of undesirable insects. Insect friends need food, water, and shelter.

To attract predatory insects to your garden to help with pest control:

- Don't use pesticides, especially broad spectrum or residual chemicals. Pesticides rarely discriminate and rid your garden of many of the beneficial insects necessary for a healthy garden. Even organic pesticides can have negative impacts on beneficial insect populations. If there is no effective alternative, use only when pests are present, not as a

Predators, Pollinators, Parasites—*continued*

preventative. Use pyrethrins, insecticidal soap and horticultural oil sprays that leave little or no residual, and only treat areas being damaged by pests.

- Use mechanical means to foil insects, such cutworm collars or floating row covers.
- Plant a variety of flowering plants, especially those with small flowers rich in nectar. Although many of the larvae are predators, these will supply the nectar and pollen by adults and provide safe places for resting and laying eggs. Dedicate 5-10% of the garden to beneficial-attracting plants – plant for blooms all season long.
- Particularly attractive are herbs allowed to flower, such as coriander, fennel, dill, lavender, thyme, mint, and parsley.
- Flowers of the composite or daisy family are also appealing to beneficials. Examples include goldenrod, coneflowers, sunflowers, coreopsis, and black-eyed Susan.
- Intercrop: mix up your plants so that those that attract beneficial insects are near those that need protection, such as vegetables.
- Place your plants close together to provide a moist, shaded environment for beneficials who dehydrate easily.
- Provide a source of water by putting out a shallow dish of water with stones to give them dry places to land.
- Minimize soil disturbance to protect soil-dwelling insects and their eggs.
- Create mulched or stone pathways to provide shelter for predatory beetles.
- Allow leaf litter to remain on planting beds to provide overwintering spots
- Plant ground cover to provide shadowy, sheltered spots for spiders.
- Keep your soil healthy by adding compost to allow soil organisms to thrive.
- Attract beneficial insects to your yard rather than buying and releasing them. Releasing insects may rid your yard of naturally occurring beneficials through competition and predation (some beneficial insects, such as praying mantises, feed on both pests and other beneficial insects). In addition, some insects, such as certain ladybugs, are migratory and, once released, quickly move on to other locations.
- Invest in a good insect guide so that you can accurately identify troublemakers and beneficials.



Some plants that attract beneficial insects

Early blooming

Basket of Gold *Aurinia saxatilis*, Rocky Mountain penstemon *Penstemon strictus*, Native potentilla *Potentilla verna*, Creeping thyme *Thymus serpyllum*, Sweet alyssum *Lobularia maritime*, Columbine *Aquilegia x hybrid*, Carpet bugleweed *Ajuga reptans*

Midseason blooming

Common yarrow *Achillea filipendulina* `Coronation Gold`, Dwarf alpine aster *Aster alpines*, Spike speedwell *Veronica spicata*, Cilantro (Coriander) *Coriandrum sativum*, English lavender *Lavandula angustifolia*, Sulfur cinquefoil *Potentilla recta* `Warrenii`, Edging Lobelia *Lobelia erinus*, Mint *Mentha sp.*, Stonecrop (various) *Sedum sp.*

Late blooming

Fernleaf yarrow *Achillea millefolium*, Lavender globe lily *Allium tanguticum*, Dill *Anethum graveolens*, Dyer's camomille *Anthemis tinctoria*, Fennel *Foeniculum vulgare*, Sea lavender *Limonium latifolium*, Wild bergamot *Monarda fistulosa*



Companion Planting:

Many of the plants that provide habitat for beneficial insects are helpful in other ways: some repel pests. The following useful list is taken from *The Bio-dynamic Source: Companion Plants and How to Use Them* by Helen Philbrick and Richard Gregg.

Cabbage worms (not to be confused with the cabbage looper) are the larvae of the white cabbage butterfly and are repelled by tomato, sage, rosemary, hyssop, thyme and wormwood.

Carrot rust fly is repelled by onions and leeks, rosemary, wormwood and sage.

Onion fly is repelled by carrots.

Mexican bean beetles are repelled by the marigolds and the planting of bush beans and potatoes in alternate rows.

Xeriscape Plant profiles: Blanket Flower and Purple Coneflower

Maureen Kiely

Gaillardia pulchella - Blanket Flower

If you want to start adding drought-tolerant flowering plants to your garden, *Gaillardia pulchella* is always a good choice. The plants grow 1 to 3 feet in height, spread 12 to 24 inches, and produce gorgeous orange and red flowers all season long (provided you dead-head the finished blossoms). *G. pulchella* is included in the book, "Best Garden Plants for Montana," by Dr. Bob Gough, Cheryl Moore-Gough, and Laura Peters. Here is what they say about the plant:

"Prefers full sun. Soil should be of poor or average fertility, light, sandy and well-drained. The less water this plant receives, the better it will do. This plant is well-suited to exposed, sunny slopes where it can help retain soil. It requires light and warm soil to germinate. The plant forms a basal rosette of leaves. The daisy-like flowers are red with yellow tips".



<http://www.extension.org/pages/62593/plants-for-water-wise-pollinator-gardens:-blanket-flower-gaillardia-species#.VFmx95otCM8>

From my personal experience, this plant grows well in sunny areas in Helena. The deer seem to leave the plants alone. It is classified as an "annual" although in our garden it re-seeds and re-grows every year.



<http://urbanext.illinois.edu/hortanswers/plantdetail.cfm?PlantID=722&PlantTypeID=2>

Echinacea purpurea - Purple Cone Flower

From personal experience, Gaillardia can be added into a garden with *Echinacea purpurea* (Purple Coneflower) for color contrast. The pinkish-purple blossoms will also bloom most of the season if they are deadheaded.

Here is what "Best Garden Plants for Montana" says about *E. purpurea*:

"Prairie coneflower grows well in full sun or light shade. It tolerates any well-drained soil, but prefers an average to rich soil. It is drought-resistant, but prefers to have regular water. Divide every four years or so in spring or autumn. Deadhead early in the season to prolong flowering. Pinch plants back or thin out stems in early June to encourage bushy growth that is less prone to mildew. This will also encourage a later but longer blooming period."

From personal experience, these two plants can grow well together in a garden. I give them a little water once a week and deadhead the blossoms, and get beautiful red-yellow flowers interspersed with purple flowers all season long.



Mile-High Greenhouses

Vicki Lynn

I live on the west side of the mountains at 5200 feet. It can frost any day of the growing season and the winters, though not so common recently, can be very long and cold. After many frustrating years attempting to grow warm season crops (tomatoes and cucumbers for example) and never actually harvesting a ripe fruit, I realized I needed a greenhouse. And after quickly outgrowing the first one, I knew I needed a second one.

The “Little” Greenhouse

My smaller greenhouse is built onto the side of my pump house, largely out of recycled materials: cedar siding, inside and out, wood-framed windows, with batt and rigid insulation. It has a raised bed, a work area for transplanting, and a gravel floor. The actual planting area compared to the total square footage is small (less than 50%). Because of this, I grow some of the plants, such as cucumbers, vertically. This greenhouse stays warmer than my other greenhouse during the fall, winter, and spring months since it’s built onto the pump house and because of the proximity of a warm spring that keeps the ground warmer. Also, any wall area that is not windows is insulated with fiberglass insulation. The roof was corrugated fiberglass but has just been replaced with Solexx®, a polyethylene double walled covering (sort of like corrugated cardboard) that I hope will decrease heat loss through the roof during colder months.

Though the actual planting area is relatively small, I keep most of it planted all year. Here’s a timeline of how I use this greenhouse to get the most out of it.

Fall/Winter: in October, after the tender crops have finally frozen out, I clean out the bed, add compost, and plant 4 to 5 inch tall lettuce, chard, and kale plants that were started in early August. In November, after watering deeply, I mulch the plants with several inches of straw and cover them with a floating row cover. I don’t provide supplemental light or heat. During the winter, I water the bed two to three times. This past winter was long and cold, with three severe cold snaps.

Spring: at about the beginning of March, I remove the row cover from the plants. This spring, all of the kale and about half of the lettuce died; since this hasn’t happened in the last 2-3 years, I think they succumbed to the cold. The lettuce that was most hardy was the variety red oak leaf, though a few butterheads and romaine survived. The chard variety was Silverado and the kale variety was Toscano. By the first part of April, I start enjoying salads from the greens. In early April, I plant spinach and Asian greens in between the other greens. I also use this greenhouse to harden off bedding plants (tomatoes, cucumbers, peppers, and others) that I’ve had in the house. By the end of May, I remove all of the greens to prepare for the summer crops.

Summer: I work in more compost and plant cucumbers on trellises, basil, pepper plants, one tomato (in a tomato cage to rein in sprawling), and one optimistic melon plant. By late summer, it’s a jungle and sometimes the cucumbers shade the peppers too much.

I use the greenhouse to overwinter a dwarf peach and dwarf plum and a number of other tender plants in pots. I occasionally plant Austrian winter peas and rye as a green manure crop in early spring if I don’t have a lot of greens wintering over. If the winter is relatively warm, I may have an aphid problem in the summer. If the winter is cold, like last winter, I have very few aphids.



The “Little” Greenhouse



Mile-High Greenhouses - *continued*

The “Big” Greenhouse

The larger greenhouse is a hoophouse that is about nine feet by twelve feet with a central walkway and a door in each end. The ends are plywood and each has a screened opening that can be covered by a piece of plywood. The thermal characteristics of this greenhouse are very different from the little greenhouse since there’s no heat storage and the area of heat loss through the plastic roof is much greater. This greenhouse tends to over-heat in the summer and I put up a shade cloth on the southwest side.

I use this greenhouse for summer and early fall use, with only occasional early spring use for growing greens. This greenhouse has been flooded by the nearby river in late May and early June since it’s in a low spot; it also is more susceptible to frost. I set tomato plants out about the first of June. I also grow cucumbers and scarlet runner beans on trellises, tomatillos, and plant some tender flowers for color. Violas, nasturtiums, and poppies volunteer, adding color and contributing to the jungle-like quality.

To extend the season on either end of the summer, I cover the plants inside the greenhouse with a floating row cover. Since I don’t use the big greenhouse for winter crops, I’ve found it’s a great place to store lawn furniture, hoses, and the lawn mower in the winter.



The “Big” Greenhouse

Cats and Lilies – Not a Good Combination!

Judy Halm

The Food and Drug Administration has issued a reminder to gardeners and home decorators that lilies can be poisonous to cats. All parts of the lily plant – leaves, petals, pollen – are toxic, and can cause acute kidney failure within a short period of time.

The initial symptom your cat will experience after eating a lily will be vomiting, followed in a few hours by frequent urination. As the kidneys fail, the cat will no longer urinate. Without treatment by a veterinarian, the cat will die within four to seven days.

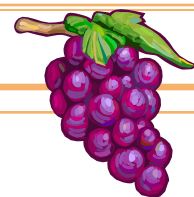
If you want to grow lilies or have them in your home and still protect your feline friends, make sure that the cats don’t have access to the lilies. Fencing the outside

plants with a cat-proof enclosure may prevent accidental poisoning while the cat is outdoors. For indoor lilies, try to place them in locations where your cat can’t reach, and clean up any pollen that falls from the blooms.

To read the FDA consumer update, follow this link: <http://www.fda.gov/downloads/forconsumers/consumerupdates/ucm393178.pdf>



An Introduction to Northern Backyard Viticulture - From Yard to Table



Sue Leferink

Grapes belong to the Vitaceae family and are the queen of the fruits. They come in 3 patriotic colors: red, white or blue. A red grape has the simplest flavor. Blue or black grapes taste best when the fruit color is a deep dark hue. White or green grapes are the sweetest of the fruit. Grape vines are documented as the earliest wild plant cultivated in history, going back to 4000 B.C. The longest living grape vine on record is 400 years old. The average life of a vine is 60-70 years. Vines between 10 and 30 years have the best yields. In a typical season one vine takes 150-180 days to produce between 25-30 pounds of fruit.

Health Benefits of Grapes

- Boosts Metabolism
- Has Low Glycemic Levels
- Reduce Migraines
- Enhance Brain Health
- Improve Digestion
- Reduce Risk of Cancer
- Improve Eye Sight
- Lower Cholesterol
- Improve Kidney Function
- Reduce Asthma Symptoms
- Boost Immune System
- Act as Laxative

All parts of the plant are edible and serve many purposes. Grapes can be consumed raw or dried (table grapes). The juice can be used to produce jams, jellies, juice and wine. Young, tender leaves make a great edible wrap and can be used to steam, bake, grill or smoke meats. Leaves can also be added to jars when canning pickles to make them crunchier. Oil can be extracted from the seeds and used for salad dressing and cooking. There are several medicinal benefits associated with grapes. They contain nutrients, antioxidants, minerals and vitamins. Grapes are also wonderful for wildlife. The fruit attracts all sorts of birds and the ladybugs feed on the dried fruit in the spring until aphids begin hatching.

Cultivars– Selecting the right vine for your needs

There are at least 50 species (20 of them are in the U.S.) and over 16,000 cultivars of grape vines worldwide. Different cultivars serve different purposes and have different growing requirements. American cultivars (*Vitis labrusca*) have a foxy “musty” aroma and are best used as table grapes. Table grapes (used for fresh eating, jams, jellies and juice) tend to be hardier, require less care and are easier to grow. River bank grape also known as frost grape (*Vitis riparia*) is native to Montana and grows wild throughout the U.S. It is used to create hardy cultivars. Our native Montana grape grows with very little care. European cultivars (*Vitis vinifera*) are used primarily for wine. Wine grapes (higher in tannins with the ideal balance of sugar to acid) are more delicate. It is difficult to create flavorful perfection. The good news is there are now several additives for wine making which will produce a delicious wine from imperfect fruit.

There are a limited number of cultivars that will successfully grow in Montana (especially wine grapes) due to our cold climate, short growing season and extreme temperature fluctuations during the winter which can cause plant cells to rupture and burst. Fortunately, other northerners like Elmer Swenson have paved the way, developing cold hardy strains of grapes in collaboration with our northern university extension offices. While many cultivars grow in Montana, it is difficult to get fruit to ripen before frost due to the short season and cool summers. In Lewis and Clark County, the average number of frost free days range between 97 to 153, depending on your elevation and microclimate. This means that early (mid-August) to mid-season (mid-September) cultivars are the best choice for reliable harvests. Below is a list of cultivars known to grow and produce fruit in cold climates. Stick with locally grown or northern grown winter hardy vines. Some cultivars have a propagation fee associated with them. These small fees are collected by the univer-

Cultivar Breeder Year Developed	Type/Color	Lineage	Hardiness USDA Rating	Ripens	Berry/Cluster Ave Weight	Description/Notes
Beta* (b) Louis Suelter 1881	Table Juice Blue	Concord Carver River Bank	Hardy -40° F Zone 3	Mid September	B-Med C-Tight unknown	Tolerates a wide range of soil conditions. Needs good drainage. Extremely cold hardy, vigorous grower. Shelter from wind. Good landscape vine, attractive year round. Leaves have a reddish tint in fall and a beautiful trunk.
Brianna (h)(k) Elmer Swenson 1983	Table Juice Wine White	Kay Gray River Bank	Tender -25° F Zone 4	Mid September	B-Med C-Tight .24 lbs.	Slight upright growing habit. Berries are medium, round, greenish gold to gold when fully ripe. Wine is balanced with pineapple nose and flavor. Also makes a flavorful white juice.
Canadice * \$ (Seedless) Cornell University 1954	Table Red	Bath Himrod	Tender -20° F Zone 5	Mid September to Early October	B-Sm C-Tight .25 lbs.	Sweet, spicy flavored fruits. Suitable for making jams as well as raisins. Produces showy fruit and some fall color. Slightly susceptible or sensitive to powdery mildew. Long storage life.
Edelweiss* Elmer Swenson 1980	Table Juice Wine White	Beta Witt	Moderate -30° F Zone 4	August	B-Med C-Loose .32 lbs.	Excellent disease resistance and adaptability, vigorous. Pleasing flavor, more pronounced the longer it hangs on the vine. Makes a sweet wine when harvested early. Vulnerable to late spring frosts.

An Introduction to Northern Backyard Viticulture - continued

Frontenac (h) \$ University of Minnesota 1996	Wine Red	Landot River Bank	Moderate -35° F Zone 4	Mid Septem- ber	B-Sm C-Loose .28 lbs.	Good resistance to powdery mildew. Berries must be left on the vine long enough to mature fully. It produces less tendrils so needs to be tied to support.
Frontenac Griz (k)\$ University of Minnesota 1992	Wine White	Frontenac River Bank	Hardy -38° F Zone 4	Mid Septem- ber	B-Sm C-Loose .29 lbs.	Moderate susceptibility to powdery mildew. Small grey berries are born on medium sized, loose clusters. Suitable for table and dessert wines. Aromas include peach, apricot, citrus, and pineapple.
Kay Gray *(b)\$ Elmer Swenson 1981	Wine White	Golden Muscat Onaka	Hardy -42° F Zone 4	Early Sep- tember	B-Med C-Tight .21 lbs.	Strong resistance to disease. The clusters and berries are somewhat small but good eating. Has a grape to a pleasant fruity aroma.
King of the North Origin Unknown Year Unknown	Table Juice Wine Red	America Cultivar River Bank	Hardy -37° F Zone 4	Mid to Late September	B-Med C-Tight .19 lbs.	Very vigorous vine bearing heavy clusters of fruit and producing 5-6 times more growth per year than other similar cultivars. Good flavor for table grape or juice. Establishes quickly; fruits at a young age.
La Crescent (k) \$ University of Minnesota 1988	Wine White	St. Pepin Muscat Hamburg	Hardy -36° F Zone 4	Mid Septem- ber	B-Sm C-Loose .32 lbs.	Wine can be excellent in a semi sweet or dessert style. Similar to a good Vignole or Riesling but with apricot and honey in the nose and flavor.
Léon Millot (h)(k) Oberlin Institute 1950	Juice Wine Blue	Millardet et Grasset Goldriesling	Tender -25° F Zone 4	August	B-Sm C-Loose .15 lbs.	Grows with fair vigor and has high resistance against fungal diseases. Small berries and clusters. Time-consuming to manually harvest. Wine aroma similar to a ripe Syrah or Pinot Noir
Marquette (k)\$ University of Minnesota 2006	Wine Red	Ravat Frontenac Pinot noir	Moderate -35° F Zone 4	Mid Septem- ber to Early October	B-Sm C-Tight .19 lbs.	Vine habit is open and easily managed. Finished wines are complex, with attractive ruby color, pronounced tannins, and desirable notes of cherry, berry, black pepper, and spice.
St Croix * (b) Elmer Swenson 1983	Table Juice Wine Blue	Seibel Seneca	Hardy -40° F Zone 4	Mid Septem- ber	B-Med C-Tight .22 lbs.	Good disease resistance. Low tannin. Achieves 18-20 brix with moderate acidity. Also makes a suitable seeded table grape.
Somerset Red (k) (Seedless) Elmer Swenson Year Unknown	Table Juice Red	Unknown	Moderate -30° F Zone 4	August	B-Med C-Tight .33 lbs.	A seedless grape with small, orange-red berries and good flavor.
St. Theresa * (Seedless) Elmer Swenson 2008	Table Blue	Concord Thompson	Moderate -30° F Zone 4	Early Sep- tember	B-Med C-Tight Unknown	A Plant Select® cultivar with sweet fruit. Vigorous vine even in alkaline soils.
Swenson Red (b) Elmer Swenson 1962	Table Wine Red	Beta Witt Seibel	Tender -25° F Zone 4	Early Sep- tember	B-Large C-Tight .19 lbs.	Meaty texture with tender skin. Strawberry-like flavor, much like a good seeded California table grape. Susceptible to downy mildew.
River Bank (V. riparia)* Native	Jams Wildlife White	Native	Hardy -70° F Zone 2	August to October	B- Sm C-Tight Unknown	Native to Montana. Used for hardy rootstock (both cold and disease resistant). Good vigor.
Valiant *(b)\$ South Dakota State University 1982	Table Juice Red	Riverbank Fredonia	Hardy -50° F Zone 3	August	B-Sm C-Tight Unknown	Requiring a dry climate it is very susceptible to the mildew diseases. Unusual extreme cold tolerant. Goes dormant around September 1st. Needs no winter protection. Mostly used in blends and jelly.
Worden* Schuyler Worden 1863	Table Juice Wine Blue	Concord	Hardy -40° F Zone 4	Early Sep- tember	B-Large C-Tight .25 lbs.	Tolerates a large range of soil conditions. Sweet variety with excellent quality. Great as a table grape, juice or jelly. Both berries and clusters are large. A vigorous and hardy vine, it is also disease resistant.

* indicates cultivar is available from a local nursery

(h) indicates cultivar is being tested in Helena by the Lewis and Clark Extension Office at the Peoples Garden at the Lewis and Clark Fairgrounds

(b) indicates cultivar is being tested by the Montana State University Extension Office at the Horticultural Farm in Bozeman

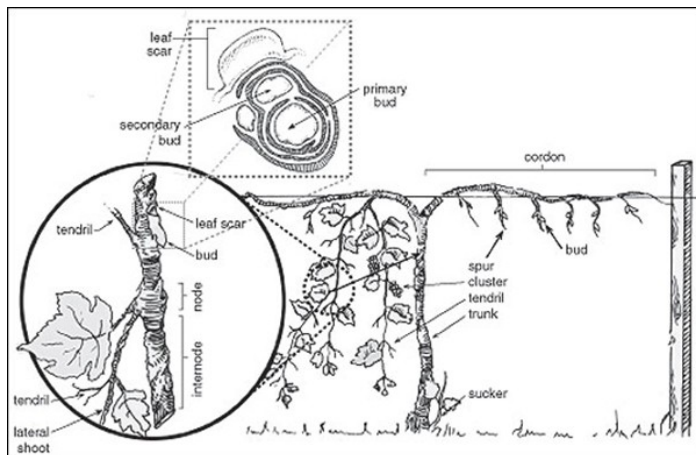
(k) indicates cultivar is being testing by the Flathead Extension Office in various locations around Kalispell

\$ indicates there is a propagation fee associated with the vine

An Introduction to Northern Backyard Viticulture - continued

Growing Requirements and Recommendations for Montana

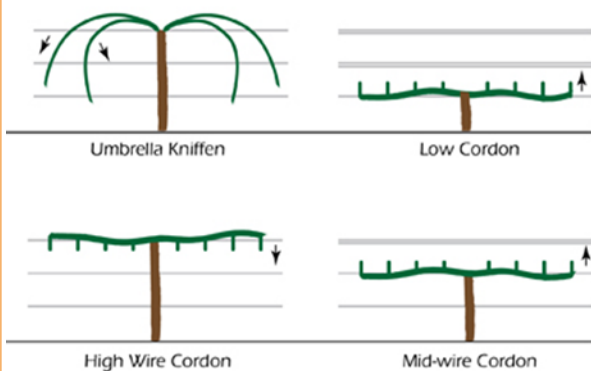
Growing grapes in Montana is all about selecting the right location, the right cultivars and caring for the vines properly. Grapes love heat. Vines need full sun. Plant them in well drained, loamy acidic soil (5 to 6.5 ph). Southern exposure is critical for good fruit production. A slope or hillside (up to 3% grade) is recommended. Ideally in northern climates, vines should be planted so trunks grow at a 45 degree angle from the ground to maximize heat collection and release cold air faster. This technique allows fruit to ripen quicker. Planting vines along a rock wall will increase solar gain. Never plant rows parallel to the wind. Winds reduce transpiration and slows growth. Angle rows 45 to 90 degrees from prevailing winds to reduce impact. A wind break or protection is required where winds blow more than 9 mph.



Components of a Grape Vine – Used with Permission
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When purchasing plants, the vine should come from a northern climate. If vines are grafted, verify root stock is from a hardy species such as *Vitus riparia*. There are several planting techniques for tender wine cultivars to help them survive in Montana such as trenching (adding a few inches of soil annually around the base of the plant for the first few years) to encourage deeper roots. If you are starting a wine vineyard, it is best to do some additional research to determine the best method for your situation. I highly recommend purchasing a copy of *Northern Wineworks: Growing Grapes and Making Wine in Cold Climates* by Tom Plocher and Bob Parke. For the rest of you backyard gardeners, these simple steps should do the trick. Plant vines 6 to 8 feet apart in the spring as soon as soil is workable. If you are planting rows, they should be 8 to 12 feet apart. The hole should be wide enough for roots to spread out without bending to fit in the hole. Loosen the soil about two feet down and add a few shovels full of compost towards the bottom and around the edges to encourage roots to go down deep and spread out. Fill up the hole before planting with water to verify it has good drainage. If it doesn't drain within 15 minutes, either test a new location or make the hole deeper and mix in more compost to encourage drainage. Plant vine at the same depth as in the pot. If it is bare root stock, look for the soil line and plant at the same depth. When tying canes to the support system use binder twine, jute twine or plastic ties to prevent girdling. Vines should be tied during warmer temperatures before bud break. Mulch is key in our climate, so add 4 to 6 inches of a mulch. A dark or rocky mulch is best to retain heat. This helps regulate the temperature, protecting the plant from our extreme changes. Water the transplant well until it is established.

Grapes are self-pollinating (meaning fruit can be produced from a single plant). Grape vines benefit from companion planting nearby, especially hyssop which encourages pollinating insects. Giant Hyssop (*Agastache urticifolia*) is native to Montana and grows about 2-5 feet tall. Geranium, chives, basil and oregano deter harmful insects when planted near vines. Clover increases soil fertility and beans and other legumes add nitrogen to the soil.



Examples of Vine Training Systems

Used with permission - Graphic Courtesy of Department of Horticulture, Cornell University, <http://fruit.cornell.edu>

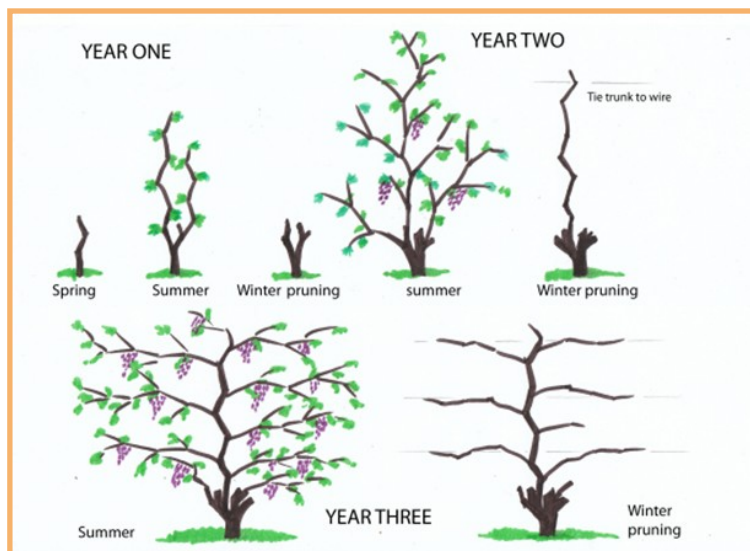
Vines require a support structure such as a fence, arbor, pergola or trellis. The type of structure used should be based on the cultivar selected. Hardy cultivars which do not require winter protection can be trained on any structure. Tender cultivars need to be removed from the support structure during winter months or have a very short trunk so the trunks can be buried every fall. Many northern universities have good articles with diagrams online explaining the various training methods. It is important to know the components of a grape vine in order to understand the training method suggested. For cooler climates the Single or Double Cordon (Geneva Double Curtain) method work well to maximize fruit production. The Low Cordon technique can be used for tender vines. The low trunk allows tender vines to be buried easier, but does make it difficult to keep ripening fruit off the ground and away from predators.

Introduction to Northern Backyard Viticulture - continued

Maintenance

The amount of maintenance required depends on the cultivars selected. Both Montana native river bank grape and American hardy cultivars require little maintenance to control growth and are a smart choice for beginners. Table grapes will require some maintenance to produce a good fruit crop. Wine grapes are high maintenance, requiring extensive training, pruning and frost protection to extend the growing season.

Pruning is necessary for good fruit production and is the most confusing part about growing grapes. Don't be intimidated, just start with the basics. Fruit is produced on the current season's growth which comes from last season's wood so if you don't get it right this season, make some notes in your journal and try again next year. There is a fine balance between the number of leaves to fruit clusters (12 to 15 leaves per cluster) to ensure a flavorful and abundant harvest. Pruning to create the right ratio is referred to as canopy management. As yields increase, the quality of the fruit decreases.



Annual Pruning and Training of Young Vines

Top 10 Reasons to Prune

- Maintain Vine Form
- Control size and bud shoots
- Thinning and training
- Remove Weak/Dead wood
- Improve Air Circulation
- Create Straight Trunk
- Improve Fruit Quality
- Increase Yields
- Heal Winter Injury

In the spring, prune out 70

-90% of the wood from

last year. Leave 40-60 buds per vine for table grapes and 20-30 buds for wine grapes. It is best to leave vines alone the first year so they can establish a strong root system. The second year, prune back to one or two canes (3-4 ft high) with 3-4 buds per cane. The third year several lateral branches will appear, trim everything back to 2 to 4 canes for more fruit. The best time to prune grape vines is in the spring. It is better to prune too early rather than too late to prevent the sap from bleeding out.

Water vines heavily (about 5 gallons 2 to 3 times a week) in the spring to early summer (April through June) to prepare for the growing season. Reduce water when it begins to get hot. This will slow vine growth, direct energy into fruit development and encourage roots to go deeper. Avoid watering with sprinklers. Water on the leaves will cause sunburn and encourage pow-

dery mildew. Test the soil and add nutrients as needed. Vines typically need nitrogen annually. A rule of thumb is to apply it in the spring at a rate of 10 pounds per 100 ft. row.

Frost Protection

If you select a tender grape species or have a harsh location with very little snow cover and high winds then winter protection is necessary. If grapes are tender, the vines should be removed from the trellis in the fall after the leaves drop, then laid on the ground, covered over with soil and then mulched. Do not use straw, as it attracts moisture and mice, instead opt for compost or corn husks. Coverings and mulches should be removed in mid-April. Another alternative to provide year around protection is to plant vines in an unheated greenhouse. Sprays can also be used to protect budding vines from late spring frosts. The spray coats the vines with a polymer protective coating to slow water loss and transpiration. If fruit is still ripening when the first freeze occurs in the fall, old sheets or floating row covers can provide enough protection to extend the season.

Harvesting Fruit

Grapes will turn color before ripening (veraison) so this is not a good indication that they are ready to be harvested. When veraison begins, fruits increase in sugar (measured in brix units) and decreases in acidity. Sugar levels can be measured using a hand refractometer. Grapes will not improve in flavor once picked, so it is important to taste the grapes prior to harvesting. Ripe grapes will pull away from the stem easily, have a nice aroma, good flavor, bright color and crisp texture. If grapes are not ripening fast enough, remove a few immature clusters so the vine focuses more energy on the mature clusters left. If clusters are still not ripen-

Introduction to Northern Backyard Viticulture - continued

ing towards the end of the season try removing leaves that block the morning sun surrounding the clusters. When harvesting, leave a few clusters of grapes on the vine and continue to taste them. Make note of the changing flavor and texture. Keep a journal to record when the best flavor occurs. Fruit can be frozen in quart packages until ready to use for making wines or jellies. Be selective when freezing fruit, make sure it is ripe, not rotted or bruised. Frozen fruit will release its juices quicker and ferment faster expediting the wine making process. It takes about 2.6 pounds of grapes to make a bottle of wine and 3.5 pounds to make jelly.

Winter Acclimation

After veraison, vines begin the acclimation process. Grape vines create their own “antifreeze”, stimulated by the shorter days and dropping temperatures. The water content of the vines are reduced and the natural antifreeze fills in between the cells. Leaf stomata remain open to encourage transpiration. By mid-October, hardy vines are able to handle temperatures of 0° F. When temperatures remain below freezing, vines enter the supercooling stage. As the remaining water moves from the cells into the spaces between them, the salts within the cells increase. Vines are then less susceptible to fluctuating temperatures that would normally cause cells to burst from the heating and freezing of water. Winter injury occurs when temperatures fluctuate drastically in a short period of time, causing water to move back into the cells from the heat of the sun and then explode upon freezing. Additional injuries occur, when cells critical to the movement of water through the vine in the spring are ruptured, leading to dehydration. Providing winter covering and selecting cultivars that take longer to respond to warmer temperatures minimize winter damage. In the spring, it is important to assess winter injury and prune accordingly. Wait until bud break to remove winter damage or vine will overcompensate with vigorous growth. Do not apply nitrogen unless shoot growth is poor. If buds are damaged, secondary buds will form and produce fruit. Reassess damaged vines in June and trim away damaged areas remaining. Remove some of the budding clusters to create a balance between fruit and vegetation so the vine can recover.

Troubleshooting Problems

Hardy grape vines are slow to break buds in the summer. Do not be alarmed if your vines do not break bud until mid-June. They will even send new shoots up from the ground if it has been a hard winter. Be careful when applying pesticides nearby. Grape vines are very sensitive to the fumes of 2, 4-D and can be damaged from nearby sprays. The most common pests are birds, therefore netting is strongly recommended if fruit harvest is important. If leaves turn yellow this is a sign of Iron Chlorosis (a symptom of over-watering), allow the vines to dry out between watering. Many grape vines are susceptible to powdery mildew. Sprays are available to irradiate fungus. The key is to spray at the right time and take preventative measures. The University of Minnesota has a great web site to assist you in identifying pests and diseases related to grape vines and provides solutions - <http://fruit.cfans.umn.edu/grapes/pest/>.

Plant for Success

Now that you have been enlightened on viticulture, it is time to go out and test the soil. Plant a cultivar or two in your backyard and report back to the Lewis and Clark Extension office on your success or share tips for growing grapes in Montana on the blog site at <http://extension.lccountymt.gov/>. Enjoy your own taste of sweet success.

Sources:

Bojcun, (2010). *Winter Pruning of Vines from Infancy to the Fourth Year*. Retrieved from <http://urbanwinegrower.wordpress.com/2010/01/01/winter-pruning-of-vines-from-infancy-to-the-fourth-year/>

Brown, Ohio State University (2004). Basic Principles of Pruning Backyard Grapevines. Retrieved from <http://ohioline.osu.edu/hyg-fact/1000/1428.html>

Hoover, Hemstad, University of Minnesota (2013). *Growing Grapes for Home Use*. Retrieved from <http://www.extension.umn.edu/garden/yard-garden/fruit/growing-grapes-for-home-use/>

For every garden project you plan, take into account the following rules:

- It will take twice as long as you think.
- It will cost three times more than you planned.
- You will need four times as many tools, most of which you do not own.

Recipes of the Month:

Grilled Beef Dolma with Basil Yogurt Dip

Dolma is a Middle Eastern dish consisting of stuffed grape leaves which can be used as an appetizer, main dish or side dish. The name comes from the Turkish word "dolma" meaning "stuffed". Anything goes for stuffing (vegetables and/or meat). They can be stored in the refrigerator for few days or frozen. Reheat to enjoy. Makes 18-24.

Preparing grape leaves

If using fresh leaves, verify they are free of pesticides. Use tender, young leaves. Wash them and then place in container. Pour boiling water over them until they turn olive green. Rinse in cold water, strain and set aside. For preserved leaves (which can be purchased at health food stores), rinse, strain and set aside.

Main Ingredients

1 lb lean ground beef (or vegetarian substitute)
 1 6 oz can tomato paste
 2 shallots finely chopped
 3 tablespoons dried minced onion
 1 clove garlic finely chopped
 1 cup cooked brown rice
 1 tablespoon dried basil
 ½ teaspoon cyan pepper (or to taste)
 ½ tsp salt
 ½ tsp garlic salt
 1 tsp black pepper
 ½ tablespoon olive oil
 High heat cooking spray (olive oil)

24 fresh or preserved grape leaves
 4 skewers

Basil Yogurt Dip

½ cup Greek yogurt
 1 finely chopped garlic clove or 1 tsp garlic paste
 3 tablespoons finely chopped fresh basil or basil paste

Combine all yogurt dip ingredients and blend in a small food processor or blender, cover and refrigerate.

Dolma

Cook brown rice according to directions on package. Set aside. Sauté shallot and garlic in olive oil over medium heat until light brown (about 5 minutes). Mix with rice and set aside. Mix together the rest of the ingredients together (except grape leaves) and add in rice mixture (should look a bit like meatloaf). Lay a grape leaf flat on cutting board, vein side up and cut out bottom stem. Place a tablespoon of meat mixture (more or less depending on leaf size) towards bottom of leaf, fold bottom flaps of leaf over meat, tuck in sides of leaf and then roll tightly like a mini burrito. Place 6 dolma per skewer (if wooden, soak skewers in water for 30 minutes prior to grilling). Heat grill (medium). Spray skewered dolma lightly with a cooking spray on both sides. Grill for 15-18 minutes, flipping over halfway through. Serve warm with chilled yogurt dip.



Grilled Fish Dolma with Dill Dip

Dolma is a Middle Eastern dish consisting of stuffed grape leaves which can be used as an appetizer, main dish or side dish. The name comes from the Turkish word "dolma" meaning "stuffed". Anything goes for stuffing (vegetables and/or meat). They can be stored in the refrigerator for few days or frozen. Reheat to enjoy.

Preparing grape leaves

If using fresh leaves, verify they are free of pesticides. Use tender, young leaves. Wash them and then place in container. Pour boiling water over them until they turn olive green. Rinse in cold water, strain and set aside. For preserved leaves (which can be purchased at health food stores), rinse, strain and set aside.

Ingredients

4-6 fresh fish fillets about 1 lb (walleye, perch or halibut)
 3 shallots finely chopped
 3 tablespoons dried minced onion
 1 to 2 cloves garlic finely chopped
 1 lemon
 ½ teaspoon cyan pepper (or to taste)
 ¼ teaspoon garlic salt
 3 tablespoons dried dill
 3 tablespoons finely grated parmesan cheese
 1 tsp black pepper
 1 to 2 tablespoons olive oil
 ¼ cup light sour cream
 3 tablespoons light mayo
 High heat cooking spray (olive oil)

8 – 10 fresh or preserved grape leaves
 2 skewers

Dill Dip

¼ cup Greek yogurt
 1 finely chopped garlic clove or 1 tsp garlic paste
 3 tablespoons dried dill
 1 tsp lemon juice
 Combine all dip ingredients, cover and refrigerate.

Dolma

Sauté shallots, garlic and minced onion in olive oil over medium heat until light brown (about 5 minutes). Set aside. Cut lemon in half and squeeze the juice from half of it. Add all but one tablespoon (add to sauce) and one teaspoon (add to dip) to half of the sautéed mixture. Place mixture in a container with fish fillets to marinate for 1 to 2 hours in the refrigerator. Quarter the other lemon half to serve with meal. Mix sour cream, mayo, herbs, spices, and cheese. Add the other half of sautéed mixture in and the remaining tablespoon of lemon juice. Chill this sauce mixture until ready to assemble dolmas. Heat grill (medium). Lay grape leaves flat on cutting board vein side up. Cut out bottom stem. Thinly spread sauce mixtures on leaf. Place a chunk of fish towards bottom of leaf, fold bottom flaps of leaf over fillet, tuck in sides of leaf and then roll tightly like a mini burrito. Place 4 dolma per skewer (if wooden, soak skewers in water for 30 minutes prior to grilling). Spray skewered dolma lightly with a cooking



Gardening Calendar

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.

November:

- Drain hoses and sprayers
- Store garden chemicals properly for the winter. Check product labels to see if freezing will harm the products

If ground has not yet frozen:

- Pull dead annual flowers from beds and pots. Pull out old vegetable stems and /or turn over in bed
- Dig up gladiolus, tuberous begonias, cannas, and dahlias and store in cool dark location. (see article on page)
- If dry conditions exist, water (early in the day): lawns, trees (especially evergreens), and shrubs to prevent winter desiccation; if soil is dry one inch down, water perennials
- Fall tilling helps improve soil structure and usually leads to soils warming up and drying faster in the spring, allowing for earlier planting.
- Dig out new beds, adding compost, organic matter and raked up leaves.
- Plant spring bulbs including daffodils, crocus and tulips.
- Apply winter mulch to strawberries when plants are dormant but before temperatures drop below 20°F.
- Protect the graft union on rose bushes by mounding soil up 12 inches around the plants and adding mulch on top. Wait until after several killing frosts have occurred so that plants will be dormant when covered. Plants covered too early may be smothered
- Trim chrysanthemums to 4 to 6 inches after they finish blooming—
- Cut back dead perennial stems and remove all diseased debris such as powdery mildew, but leave ornamental grasses. Bag diseased debris and discard.
- Renew mulch to cover bare ground around perennial flowers, especially those exposed to winds or lots of sun. As a general rule do not mulch perennial beds until after the top inch or two of soil has frozen, to discourage rodents from nesting..
- Cover rhubarb and asparagus beds with composted manure and straw.
- Protect tender evergreens from drying winds with burlap or other type shield.
- Prune dead, diseased, or damaged branches from trees and shrubs.
- clean, sharpen, and oil garden tools. Clean and oil lawnmower; check owner's manuals for how to winterize mower and other power equipment.
- Prevent rabbit and rodent feeding damage by erecting physical barriers, such as metal mesh (1/4") hardware cloth. Pull mulch away from the trunk a few inches because the mulch provides a warm winter home for rodents.
- Prevent frost cracking (or sunscald) by wrapping tree trunks with tree wrap or painting the south and southwest facing sides of the trunk with white latex outdoor paint. Young, thin-barked trees such as maples and many fruit trees are especially susceptible.
- Watch for aphids and other pests on container plants that will spend the winter inside. Rinse with steady spray of water and treat with insecticidal soap thoroughly. Consider re-potting in new soil
- Reduce fertilizer applications to houseplants

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.

Useful Links and Contacts

MSU Extension Yard & Garden: <http://www.msuextension.org/category.cfm?Cid=5>

Missoula Plant Diagnostics Database: <http://www.co.missoula.mt.us/extension/plantdata/>

National Center for Appropriate Technology gardening publications: <http://www.attra.org/horticultural.html>

National Garden Association: <http://www.garden.org/>

Helena Garden Club: <http://helenagardenclub.wordpress.com/>

Lewis & Clark County Extension Office Web site: <http://www.co.lewis-clark.mt.us/index.php?id=75>

MSU Master Gardener Program: <http://www.mtmastergardener.org/>

Helena Community Gardens: <http://helenagardens.org>

Helena Master Gardeners: HelenaMasterGardeners@hotmail.com

Brent Sarchet, Lewis & Clark County Agricultural Extension Agent: (406) 447-8346 bsarchet@co.lewis-clark.mt.us

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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

Q: Why do so many Blue Spruce Trees around town have brown needles?

A: A big part of my job as an Extension Agent is diagnosing problems with trees, which is great because anyone who knows me knows that I love trees. This year I have been called to look at more Blue Spruce (*Picea pungens*) trees than ever before. Sometimes I think we have a kind of love affair with Blue Spruce trees because you see so many new plantings of them. So what's going on with them? First of all, think about where Blue Spruce trees are native, and where you find them living in their natural environment.

Blue Spruce trees are native to the central and southern Rocky Mountains. The only part of Montana where they are native is on the western edge of Yellowstone National Park. Blue Spruce are commonly found along stream banks in moist canyon bottoms where the annual average precipitation is 36 to 60 inches, thus another common name for Blue Spruce is Water Spruce.

Many of the Blue Spruce around town are suffering from winter desiccation. Trees, especially evergreens, are transpiring and losing moisture even in the winter. Our cold, windy winters precipitate this loss of moisture. Consequently, if the trees don't have adequate soil moisture going into the winter, their needles turn brown and drop from the tree in the spring. One of the challenges in diagnosing tree problems is trees are slow in showing symptoms of a damaging factor (biotic or abiotic), so that is why in the spring you see the brown needles on the Blue Spruce trees, 4 – 5 months after winter.

Will these trees survive? Most likely they will survive and recover, if the trees are watered sufficiently. Many of the trees with winter desiccation have new growth, so the trees are not dead. It may take a few years for the trees to fill in and recover. How can you prevent winter desiccation in the future? First of all, right tree, right location. If you plant a Blue Spruce in direct wind, they are going to suffer. Select a species that is best suited to the location. Second, give the trees plenty of water especially in the fall.

While winter desiccation is the main culprit behind the sick looking Blue Spruce trees, there are other things to look for in this species. I have found many Blue Spruce around town with cytospora canker (*Cytospora* spp., *Leucocytospora* spp.), which is a common fungal disease that affects many species of trees. The most important thing you can do to help prevent it is reduce tree stress, and prune out any limbs that have the cankers as soon as you see them to prevent spread to the main stem. Many Blue Spruce also have pine needle scale (*Chionaspis pinifoliae*). These are the little white specs you see on the needles of pines and spruce. Pine needle scale usually isn't a problem for healthy trees. Pine needle scale in addition to other stresses can cause a tree to decline.

