



Garden CHECK

The most frequent question I receive from frustrated gardeners is "Why does my [fill in the blank] refuse to flower?" While

the answer is typically complex, the problem can be attributed to one of five causes—plant age, temperature, light, nutrition or pruning practices.

Age. Many woody plants pass through a period of growth called the juvenile stage, during which time the plant does not flower. This stage occurs early in the life of the plant and is sometimes characterized by a different leaf shape than is found on older plants of the same species. English ivy (*Hedera helix*) remains juvenile for a long time and is characterized by lobed leaves and a climbing habit. Well-established ivy will eventually become mature and no longer climb, have rounded leaves and bear flowers and fruit. You can sometimes see mature ivy at the top of a building where it has been climbing for many years. The mature ivy will hang away from the building in a large clump since it no longer has the ability to climb.

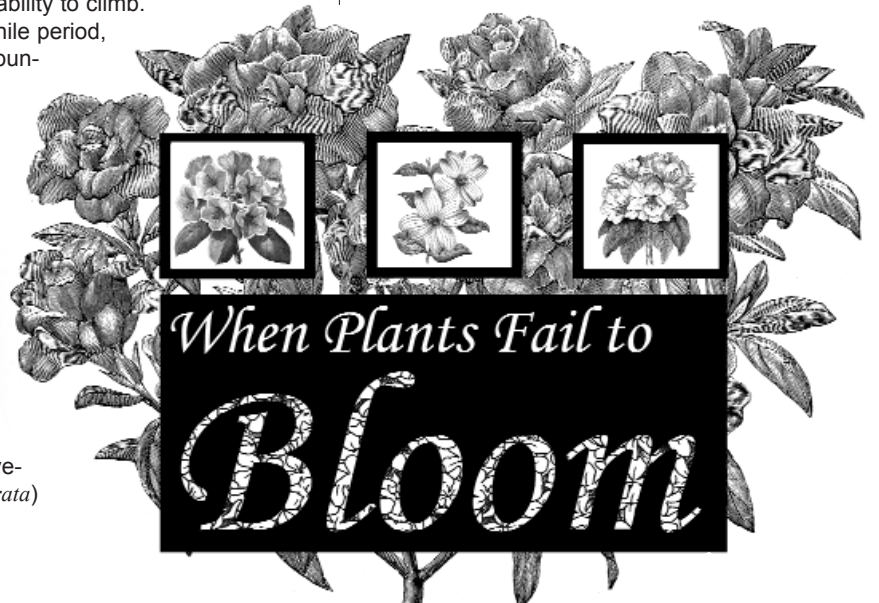
During the juvenile period, plants produce an abundance of leaves and new shoots, but are prevented from flowering by a complicated chemical balance of plant growth regulators within the plants. The juvenile stage may last two or three years on some flowering shrubs or as many as five to 10 years on tree species. Dove-tree (*Davidia involucrata*)

takes about 10 years to start flowering and requires significant patience before one can enjoy the handkerchief-like blooms. *Ginkgo biloba* has such an undesirable fruit that only the male tree should be planted, but it can take up to 20 years for a seedling Ginkgo to flower so many nurseries produce Ginkgo from cuttings of known male trees.

Sometimes cultivars are selected because of their ability to flower at a very young age. One of the yellow-flowered magnolia hybrids (*M. acuminata* x *M. denudata*), 'Sundance', is recommended because it flowers when it is very young.

Plants that have been budded or grafted may have flowering delayed or hastened, depending on the type of rootstock onto which the plant was grafted. In general, rootstocks that restrict growth (such as those used for dwarf trees) produce plants that flower at a younger age

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THINGS TO DO THIS MONTH.

- Fertilize your lawn with no more than one lb. nitrogen per 1,000 sq. ft. of lawn. (Unless you use a slow-release fertilizer).
- Clean up the vegetable garden, removing any old plants and sow a crop of oats as a green manure for spring.
- Bring in houseplants as the night temperatures drop.
- Thoroughly clean foliage and pots of houseplants as you bring them indoors.
- Dig summer bulbs and store in a dry, frost-free place in slightly moistened peat moss.
- Renovate lawns up to October 15.
- Plant most trees and shrubs. (A few species such as hollies and Leyland cypress don't tolerate fall planting.)
- Plant spring bulbs.
- Hang harvested herbs upside down to dry in a dark area that is 70° to 80° F.
- Keep Christmas cactus in cool temperatures (50° to 55° F at night) to set flower buds.
- Water fall-planted trees and shrubs as roots continue to grow.
- Move and divide crowded perennials.
- Cut back stems and foliage of herbaceous perennials when the leaves begin to brown.
- Move perennial herbs (such as parsley, chives, sage and thyme) indoors in a small container to be used all winter.



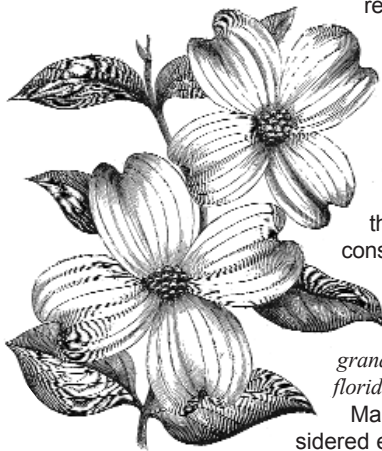
WHEN PLANTS FAIL TO BLOOM *(continued from page 1)*

than plants on rootstocks that do not limit growth.

Temperature. Temperature, particularly cold temperature, plays an important role in the flowering of many plants. When winter temperatures drop extremely low, flower buds may be killed and the plant will flower sparsely during the following season. When there is a significant snow cover, plants may bear flowers only on the lower part of the plant that was protected by snow during the low temperature period. Flower buds of flowering dogwood often have the two outer bracts injured during the winter so the resulting flower has only two bracts instead of the usual four. If you suspect excessively cold temperatures as the cause of your plant's failure to flower, examine the plant closely in the spring for brown and dead flower buds that may still be present. Sometimes injured flower buds look normal but when you squeeze the bud, you will find that it is hollow. Frozen flower buds are called "blasted." (I think I've heard that before—Those blasted flowers just don't seem to bloom!)

On the other hand, a certain amount of cold temperature is required for many ornamentals and houseplants to flower properly. Vernalization is the term applied to this cold-temperature requirement. Bulbs must be properly vernalized (subjected to a cold treatment) before they can be forced into bloom indoors. It is unlikely that plants growing outdoors in Delaware would not receive sufficient vernalization for spring bloom.

Light. Photoperiod, or the number of hours of light and dark to which a plant is exposed each day, controls the flowering of many plants. "Short-day" plants require a prolonged dark period (15 to 18 hours) in order to flower because it is during the dark period that the chemical transformations required for flowering occur. Poinsettia, chrysanthemum and gardenia are three common short-day plants. Short-day houseplants may be given their

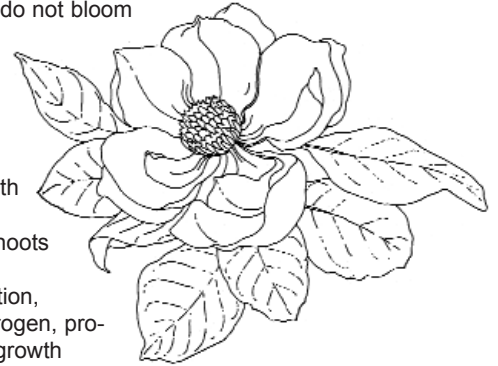


required dark period by putting the plants into a closet at 5 p.m. and taking them out the following morning at 8 a.m. for about 12 weeks. "Long-day" plants require a light period of 15 hours or longer in order to flower. Garden shrubs that are long-day plants and, consequently, flower during the long days of summer include Rose of Sharon (*Hibiscus syriacus*), Glossy Abelia (*Abelia grandiflora*) and Wiegelia (*Wiegelia florida*).

Many plants, although not considered either long-day or short-day, require light for flowering. Shrubs and perennials planted in dense shade may produce lush growth and appear very healthy but produce few, if any flowers. Rhododendron is often considered a shade-loving plant, but

many hybrids just do not bloom in dense shade and require a sunny spot for good flowering.

Nutrition. Vigorous plants with a great deal of foliage and new shoots may fail to bloom. Excessive fertilization, especially with nitrogen, promotes vegetative growth rather than flowering. To induce a plant under such conditions to bloom, decrease the rate of fertilization and water the soil thoroughly to flush the excess nitrogen from the root area. It may require a year or two before the effect of the excess nitrogen is removed from the plant and for normal flowering to occur.



Pruning. Lack of flowering can also be related to improper pruning. Some plants produce flowers on "old wood," or wood that developed the previous fall. Those plants usually bloom in the spring. Pruning plants that flower on "old wood" in the late fall or early spring will remove the flower buds and reduce flowering. Other plants flower on "new wood." These are usually summer-flowering plants, with flower buds produced on the new growth from the previous spring. A late spring pruning would remove flower buds on those plants and severely restrict flowering. It is always better to prune flowering shrubs immediately after they bloom.

Failure to flower can be a complex problem and may not be answered by one of these simple causes. It may be the result of a combination of factors or due to a process that is simply not fully understood. There are a number of trees that flower slightly, if at all, one year and flower profusely the following year. Sometimes flowering is not even as regular as every other year.

While it may be frustrating to wait for the flowers on a plant that you expect to bloom, it is part of the suspense, seasonality and change associated with gardening. No one ever said gardening was easy, did they?

—Susan Barton

The preceding article was adapted from one that appeared in Grow Line, July/August 2002, which originally appeared in Acres n' Gardens, May 2001, Cornell Cooperative Extension, Wayne County.



CRAFT LONG-LASTING LEAVES, FLOWERS FOR WINTER ARRANGEMENTS

As cooler weather forces you indoors and away from the garden, you may look for garden-reminiscent projects to help get you through the winter months. Consider making winter arrangements of leaves, branches and berries as one interesting possibility. Preserving the shape and color of the foliage with glycerin for one-of-a-kind arrangements is an old-time practice.

The preservation procedure is simple. Just stand stems with leaves in a jar filled with a mixture of one part glycerin and two parts water. Still growing leaves will absorb the glycerin mixture best. Complete absorption typically takes two to three weeks.

Many kinds of foliage can be preserved by this glycerin process, but it is especially successful on leaves from beech, birch, peach, plum and poplar trees. Of the shrubs, try barberry, forsythia, blueberry, privet, rhododendron and rose. The leaves of many perennial herbaceous plants also can be used, including aspidistra, canna, coral bells, geraniums, iris, ivy and lily-of-the-valley.

Choose leaves that exhibit a pleasing autumn color or plants that have the structure or texture you plan to emphasize in your arrangement. In addition, prepare a mixture of glycerin, then test possible selections by letting the green leaves absorb the solution. If the stems take up the glycerin while still green, success is almost certainly guaranteed on foliage cut in the fall.

Select only perfect specimens, and wash the foliage with water to remove dirt or spray residue. If the material has woody stems, cut off the last inch with a sloping cut before inserting the

stems in a jar of glycerin-water solution. The leaves of small herbaceous plants such as ivy and lily-of-the-valley are best submerged in a half-and-half glycerin-water mix.

Allow the stems to remain in the solution until the color is uniform to the edge of the leaf. This indicates that the absorption is complete. Good air circulation and warm weather will speed up the absorption.

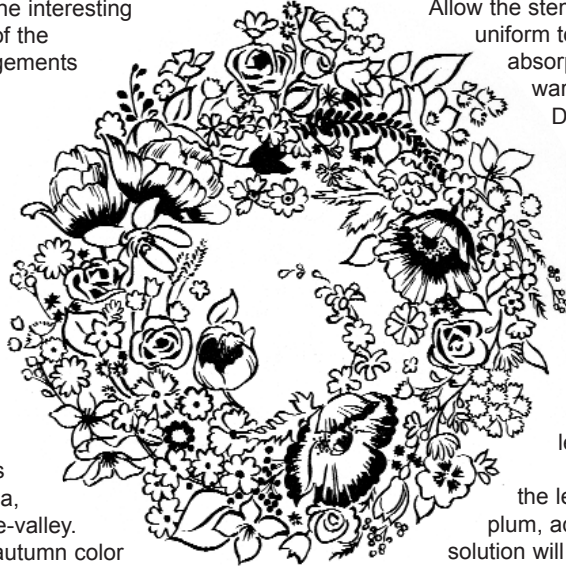
During this time wipe the leaves occasionally with a dampened cloth dipped in the solution. This will help prevent drying before the

glycerin reaches the edge of the leaves. Be careful—the leaves may wilt if left in the solution too long.

Some leaves will change color as the solution is absorbed. The effect of the glycerin treatment on the color of the dried foliage depends on the plant and its relative maturity. For good fall color, collect leaves as they approach their peak color.

Waiting too long will result in a dropping of the leaves. With some leaves such as flowering plum, adding a few drops of red food coloring to the solution will give the leaves a glossy red color.

Store the preserved leaves in boxes to protect them from damage and dirt until used. Before storing, wipe the leaves carefully with a soft cloth to remove excess moisture. Check the boxes frequently during the first few weeks of storage to ensure that leaves are not “leaking,” which could result in mold.



Adapted from an article by Wesley Judkins, Extension Horticulturist, Virginia Tech University

PLANT A WINTER COMFORTER OVER THE SOIL

A cover crop such as rye grass or clover is a temporary planting done in the fall that accomplishes three vital things: it protects the soil from wind erosion, it guards against water runoff, and it adds organic matter to the earth.

Crops grown for soil improvement are called green manure crops and are left in place for six months to a year. Legumes are especially efficient cover crops because they “fix” nitrogen from the air into the soil.

After you harvest your summer gar-

den crops, remove stalks and vines, lightly till the garden to prepare a seed bed and incorporate lime and fertilizer if needed. Broadcast the cover crop seed, rake lightly to cover it and irrigate. In places you have fall crops growing, sow cover crop seed between rows three weeks to a month before expected harvest, but no later than November 1.

If you plant a hardy species that survives the winter, it will resume growth as the weather begins to warm. Come spring, be careful not to let the crop go to seed. Till cover crops and green manures under in the spring two to

three weeks before planting new seed.

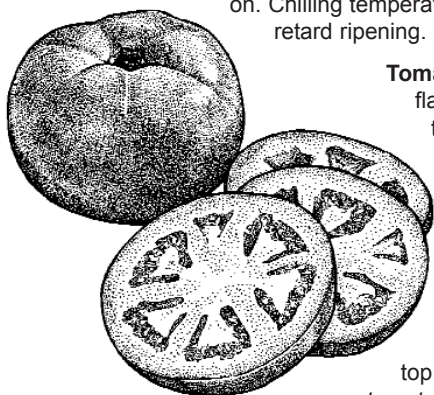
If the crop is tall or thick, first cut it with a lawn mower prior to tilling—especially legume crops because they could clog machinery. For large gardens, a rotary tiller is the easiest way to incorporate the cover crop into the soil.

Adapted from an article by Diane Relf, Extension Specialist, Environmental Horticulture, Virginia Tech University.



COOL THE REFRIGERATION WHEN STORING MANY FRUITS, VEGETABLES

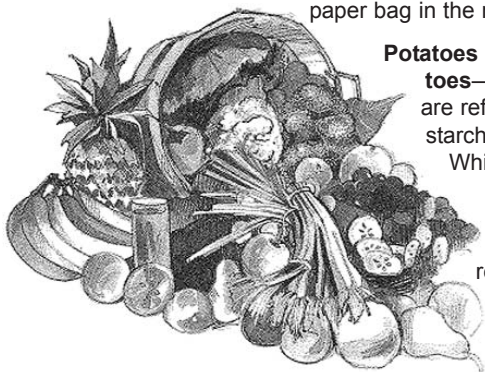
Most American consumers think that the refrigerator is the best place to keep fruits and vegetables, but not every food item can take the chill. Some fruits and vegetables should never be chilled, while others, given a few precautions, can be kept under refrigeration for a time. For example, produce that ripens after it is harvested should not be popped into the fridge. These items include tomatoes, unripe pears and all melons except watermelon. Chilling temperatures below 55 degrees F retard ripening.



Tomatoes— Tomatoes will lose flavor after just 40 minutes in the refrigerator. Instead, store tomatoes in a warm, dry area. Depending on how fast you want them to ripen, put tomatoes on a counter or on top of the refrigerator, away from the sunlight. The warmer temperatures on top of the refrigerator will make a tomato ripen faster. Make sure

none of the tomatoes touch, especially if the produce has cracks or lesions. The adage that one rotten apple spoiling the whole bunch applies here to tomatoes. The best place to store tomatoes is in an aerated basket that allows for plenty of air flow.

Cucumbers— Cucumbers are sensitive to cold because they lose moisture rapidly even when they are lightly waxed. They can be kept under refrigeration for a time; however, prolonged exposure to cold creates pocked, mushy spots on cucumbers. Eggplant and zucchini are affected in a similar fashion. Store these types of vegetables in a paper bag in the refrigerator crisper.

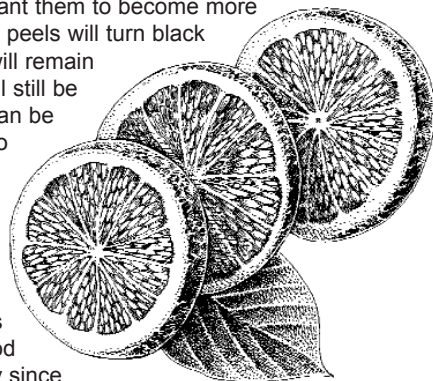


Potatoes and sweet potatoes— When potatoes are refrigerated, their starch turns to sugar. While this condition can be reversed by removing potatoes from the refrigerator, they still retain some sugar, which

causes them to brown when cooked. Keep potatoes in a dark place, slightly cooler than the normal temperature of the home, such as in a cupboard, in a basement wine cellar or storage area, or near the inside wall in a garage. If extremely cold conditions exist, cover the potatoes with a blanket or burlap to provide protection.

Tropical fruit— Tropical fruits such as bananas, mangoes and papaya should never be refrigerated. Only chill bananas if you don't want them to become more ripe. If refrigerated, the peels will turn black while the inside flesh will remain light. However, they will still be safe to eat. Bananas can be chilled or frozen prior to cooking for a special frozen dessert.

Citrus fruit— Refrigerating citrus, such as oranges, lemons, limes and grapefruit, is a good way to preserve quality since citrus fruit does not ripen after harvest.



Winter squash or melons— Winter squash should be refrigerated only after cooking and melons should be refrigerated only after being cut up. These items remain at their best in flavor and aroma when kept at room temperature.

General Storage— When storing produce in general, use the crisper drawers. In newer refrigerators, the crisper drawers can be adjusted for temperature and humidity. The crispers are usually marked fruits and vegetables or cool and moist. Vegetables and fruits stored in plastic bags with holes increases temperature and humidity.

Never store fruits and vegetable against the back wall in the refrigerator. The rear wall is the coldest area of any refrigerator and chilling injury or freezing may occur. If produce becomes frozen, handle carefully. When cabbage and celery freeze, the cells are particularly sensitive to touch. Damage and bruising may occur unless they are allowed to thaw slowly and handled very carefully.

Adapted from an article in Grow Line, Cornell University, based on information from Peter Ferretti, professor of vegetable crops at Penn State University.



KEY PESTS FOR LATE SUMMER

- . Aphids: Look for heavy honeydew with sooty mold; also off-color, pale or twisted leaves control often not needed but make note of site for next season scouting.
- . Fall and mimosa webworms: Webbing on terminals of shade and fruit tree branches with hairy caterpillars inside; prune out nests or spray strong water stream into webs.
- . Large caterpillars chewing on leaves: Locally abundant; use strong water stream or hand-pick insects into a pan of soapy water. Spot treat with insecticide.
- . Spider mites, lace bugs, and whiteflies: Feed on undersides of leaves, causing chlorotic symptoms; scout to confirm; spray only if numerous.
- . Turf grubs: Check by sampling in stressed areas; spray only if more than 5 or 6 per square foot.
- . Scale insects: Look for tuliptree, magnolia and white peach scale; treat only if heavy infestations found.
- . Home invaders such as lady beetles, crickets, box elder bugs, spiders. Exclude initially; use drying dusts to eliminate those that get inside..
- . Yellow jackets and wasps: Treat only at nest. See article in last GC.

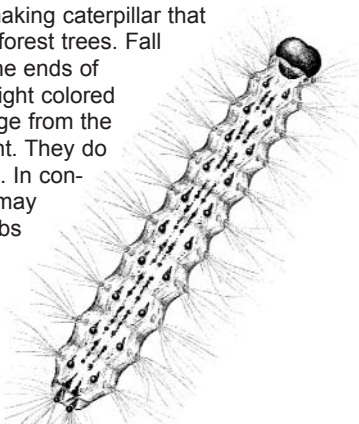
Fall Webworm

The fall webworm is a tent-making caterpillar that feeds on a number of shade and forest trees. Fall webworms weave their webs at the ends of branches. The caterpillars, often light colored with dark spots, feed on the foliage from the security provided by the silken tent. They do not leave their tents while feeding. In contrast, tent caterpillars, which you may have noticed this spring, build webs in branch crotches and do leave the tent to feed. In both tenting caterpillars, the tent is enlarged as larvae grow.

Because fall webworms spend all their time in the tent, control is relatively easy.

Remove and destroy the end of the branch as soon as you notice the tent. If pruning is impractical, the webs should be opened up with a stick, rake or water stream to allow natural predators inside.

Though seldom necessary, several insecticides can be used. Microbial Bt will attack small caterpillars. For spot treatments of



larger caterpillars, use Diazinon, Sevin or Orthene.

European Earwig

Earwigs are a general household pest because of the large numbers that can accumulate when they seek shelter in homes. They are scavengers, typically feeding after dark on decaying plant and animal matter. Earwigs will feed on living plant matter, such as seedlings, but they rarely cause serious damage to plants.

When earwigs are abundant, they can be extremely difficult to exclude from a structure, even with window screens and other mechanical barriers in place since they enter via cracks and crevices. Inside, they can be found associated with laundry, furniture, clothing and bedding.

The best way to stop earwigs from invading the home is to manage them outdoors. Eliminate breeding and nesting areas, including decaying vegetative matter like grass clippings, leaves or rotting wood. Because this pest prefers moist conditions, eliminating moist areas such as around leaky faucets, rain gutters and air conditioning units will discourage earwig aggregates.

Trapping can also be an effective way to manage earwigs. Construct traps from small boxes with holes for entry, then bait with oatmeal or bran. Collect and dispose of accumulated earwigs on a regular basis. Another trapping method involves placing a shallow dish or pan in the ground flush with the top of the soil. Add a small amount of cooking oil to capture foraging earwigs.

(continued on page 6)

Contributing Writers:

Susan Barton, UD Extension Specialist
 Dewey Caron, UD Extension Entomologist
 Gordon Johnson, UD Extension Educator,
 Horticulture
 Jo Mercer, UD Extension Educator,
 Horticulture
 Maggie Moor-Orth, Extension Ag Agent,
 Delaware State University
 Jay Windsor, UD Extension Ag Agent

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KEY PESTS FOR LATE SUMMER *(continued from page 5)*

These traps can then be emptied into a bucket of soapy water to kill any survivors.

Insecticides such as boric acid dust applied to cracks and crevices will also help exclude earwigs. For more serious infestations, apply insecticides around the foundation as a barrier to prevent earwigs from entering the home.



Where Have All The Butterflies Gone?

It seems there are fewer larger butterflies this season. One familiar summer visitor—the Monarch—was rare this season. The overwintering population in Mexico had a tough winter. Locations for refuge were reduced and a cold, chilling rain event following a

uncommon below-freezing cold snap that lasted two nights killed thousands of butterflies, resulting in fewer of these exquisite insects migrating north.

Other common butterflies were also less obvious this summer, perhaps due to our drought conditions and the effect dryness has on the nectar and plant material they need for food. In nature, such population fluctuations seem the norm rather than the exception, and scientists largely do not understand the reasons. These ups and downs in insect populations may be intrinsic to the population or extrinsic with varying environmental conditions.

Caterpillars

A caterpillar that was all too common at the end of summer was the armyworm—actually one of several species that can be severe agricultural pests. They primarily are pests of soybean and corn plants, but this year, with the larger numbers, they were also found in

home gardens and on the turf of golf courses and home lawns.

This moth is migratory, coming to us from the southeastern United States when the Bermuda High sat off the East Coast and pumped winds from that region into ours. If weather stays warm, and we don't get a killing frost, we may have them with us into the fall. Unfortunately, little control is possible. They are too large for Bt to work on and sevin, the only material homeowners might use, is not very effective in killing the larger-bodied caterpillars.

Other caterpillars have not been very evident. The drought has made the vegetation less nutritious to caterpillars and they have not been able to build up in large numbers. Some home garden caterpillars such as hornworms and zebra caterpillars have been the exception in gardens that have been tended and water provided.

—Dewey Caron

MAKE EVERY DROP COUNT: DRIP IRRIGATION FOR THE VEGETABLE GARDEN, Part I

Delaware receives an average yearly rainfall of 45 inches which, if distributed evenly, would be enough water to grow vegetables successfully. Unfortunately, rainfall is erratic, and lengthy dry periods, communities often place drought restrictions on the use of water for gardening.

After a more than a year of drought in this region, it may be time to consider drip irrigation for your vegetable garden. You may already use a soaker hose, which is similar in design, but a drip irrigation system offers several advantages soaker hoses don't such as specially designed emitters and the delivery to the soil of specific amounts of water. Much of the water applied by sprinklers is never used by plants; the drip method of watering, on the other hand, uses only a fraction of the water, applying it slowly through a plastic tube and directly to the root zone. This method saves from 30 to 70 percent of the water required by overhead sprinkler irrigation.

Advantages

- **Economy of Water Use.** The greatest advantage of drip irrigation is its low water use.
- **Fewer Weeds Germinate.** Water is directed only to the crop.
- **Easy to Operate.** Once the system is installed, it is simply a matter of opening a valve to water the entire garden.
- **Less Energy for Pumping.** The drip system requires much lower operating pressure and lower flow rate. Often the flow rate can be controlled to keep a well from running dry.
- **Fewer Leaf Diseases.** The leaves are not wetted, which discourages fungus and bacterial plant diseases.
- **Allows Work in the Garden While Watering.** Only a small area around the row of plants is irrigated. Walkways and between-row areas remain dry.





MAKE EVERY DROP COUNT: DRIP IRRIGATION FOR THE VEGETABLE GARDEN, Part I *(continued from page 6)*

- . **Less Fertilizer Needed.** Fertilizer may be applied only to the immediate area adjacent to the row, as compared to conventional broadcasting where the fertilizer is spread over the entire garden.
- . **Uniform Watering Pattern.** Overhead sprinkling can get interference from the wind, which results in uneven watering.
- . **Minimal Contamination of Groundwater Supplies.** With the limited volume of soil irrigated, leaching of fertilizer salts into the groundwater supply is largely eliminated.
- . **Labor-saving.** You do not have to shut off the faucet and move the hose.
- . **Savings on Insecticides and Fungicides.** Pesticides are not washed from the foliage as in overhead irrigation.

Drawbacks

- . Drip irrigation requires some time for initial installation.
- . It is more expensive than most sprinkler systems.
- . The tiny emission holes can become clogged with soil particles, and sometimes algae or mineral precipitates will block these holes.
- . Insects and rodents may damage the drip-line emitters.

How Water Moves Through Soils

Understanding how water moves through soil is critical to understanding why drip irrigation is better. When water is applied to the soil, it seeps down gradually through the root zone. Each layer of the soil must be saturated before water will descend to the next layer. This water movement is referred to as the wetting front. Water will move through a sandy, coarse soil much faster than through a fine-textured soil, such as clay or silt.

If only one-half the amount of water required is applied at a given time, it will penetrate only the top half of the root zone; the area below the point where the wetting front stops will remain as dry as if no irrigation had been applied at all.

Once enough water is applied to move the wetting front into the root zone, moisture is absorbed by plant roots and moves up through the stem to the leaves and fruits. Leaves have thousands of microscopic openings called stomates through which water vapor is lost from the plant. This continual loss of water is called transpiration and causes the plant to wilt unless a constant supply of soil water is provided for absorption through the roots.

The total water requirement for a garden is the amount of water lost from the plant plus the amount evaporated from the soil. These two processes are called evapotranspiration.

Evapotranspiration rates vary and are influenced by day length, temperature, cloud cover, wind, relative humidity, mulching, type and size of the plants, and the number of plants growing in a given area.



There is no need to water the entire area when plants are young. For example, young tomato plants generally have a root system less than 10 inches in diameter. With 36-inch rows the tomatoes use less than one-third of the water applied by sprinklers. Watering areas of the garden not occupied by vegetable roots only

encourages weed growth.

When there is no rainfall, shallow-rooted crops (such as lettuce and onions) spaced in rows 18 to 20 inches apart should be watered about 2 to 4 hours every 2 or 3 days. Under these conditions drip irrigation saves about 30 percent of the water needed by overhead sprinklers.

Deeply rooted crops (such as tomatoes and summer squash) spaced in rows 36 inches apart should be watered every 3 to 4 days for 4 to 8 hours when there is no rain. A 70 percent water savings may be realized if a drip system is used for rank-growing crops in wide rows because water is directed only to the area of the soil occupied by roots.

In the next issue of *Garden Check*, I will detail the installation of drip irrigation systems.

— Gordon Johnson

Adapted from Extension Bulletin 431 Trickle Irrigation For New Jersey Vegetable Gardens written by W.O. Drinkwater and H.E. Carpenter, Rutgers University, and modified by Tom Kowalsick, Extension Educator-Horticulture Cornell Cooperative Extension-Suffolk County as "Trickle Irrigation for Home Gardens."

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Agricultural Communications
113 Townsend Hall
University of Delaware
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Phone: 302-831-1355
Fax: 302-831-6758
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Susan Barton, Extension Specialist
Ornamental Horticulture

PLANT SPRING NOW!

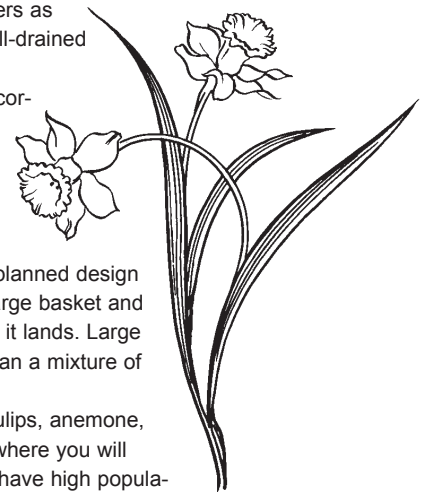
Two of the best harbingers of spring are the bright purple crocus and lemon yellow daffodil popping up in the garden. But to enjoy this spring sight you need to get to work this fall.

Bulbs are a wonderful package containing everything necessary to produce fabulous spring flowers. Even experienced gardeners know the pleasure of planting a dried-up brown lump that develops colorful flowers as the snow melts. Spring-flowering bulbs need well-drained soil, a pH range of 6.0-7, and the right light conditions. Fertilize spring-flowering bulbs by incorporating a single application of sulfur-coated, slow-release complete (9-9-6) fertilizer (Bulb Booster™) into the rooting area at planting time.

As for placement, bulbs are most effective when incorporated into the landscape in a well-planned design called naturalizing. To naturalize bulbs, take a large basket and throw the bulbs in a drift. Plant each bulb where it lands. Large masses of one color are much more effective than a mixture of many colors.

Plant early bloomers like crocus, species tulips, anemone, scilla and galanthus next to steps or doorways where you will notice them even if the weather is harsh. If you have high populations of voles, consider planting bulbs in a heavy wire mesh cage.

Spring will be here before you know it, so now is the time to plan (and plant!) for March and April bloom.



—Susan Barton