

May & June for Website

Gleanings:

“Why Trees Shed Leaves in Midsummer”

The following, authored by Dr. Francis W. Holmes, originally appeared in Hort Notes 8(9), June 23, 1997, published by the University of Massachusetts Cooperative Extension Service.

- During droughts, trees sometimes shed up to 10% of the leaves. This benefits a tree under special drought conditions because it then loses less water into the air. Loss of this much food-making capacity does little or no harm.
- Vigorous trees might make too many leaves. This excess can suddenly drop in mid-June as a natural adjustment to summer heat and lower soil moisture. Such “physiological leaf-drop” does these trees no harm.
- Trees’ inner leaves and twigs, which are “shaded out” by the upper, outer leaves, normally die for lack of sunlight. They drop off, leaving large branches bare near the trunk. This is normal, not harmful.
- A whole tree can be shaded out by an overtowering tree and then die, or two adjacent trees can mutually shade out the sides that face each other. So long as both trees remain, this might look OK, but if one tree then dies, the other has only dead branches on that side.
- Individual leaves can fail when shaded out by a dense crust of dark fungi called “sooty molds.” These grow on the sugary excretions of aphids and other sucking insects. Once these are killed, the sooty molds weather away and finally vanish.
- Leaves can fail because insects (such as the maple petiole borer) tunneled into the leafstalks, leaving only very short pieces of petioles remaining on the leaf blades. This affects little foliage and does no harm. It stops each year about two weeks after it begins. No spray is needed.
- Leaves fall, of course, after attacks of fatal diseases like Dutch elm disease or sudden devastating injuries like girdling the trunk, cutting off many roots, or freezing of roots in winter. Here, it’s too late to do anything by the time the leaves are falling. On the other hand, slow attacks—over several years—even by a fatal disease like root rot or a gradual fatal injury like smothering from fill or pavement or compaction or flooding (be it water or gas) usually leads to more and more dead branches in the tree top, and to smaller leaves, but not to an abrupt leaf fall.
- Leaves fall after local infection by certain leaf-spot disease fungi. In the individual infected leaves, pseudohormones trigger autumn-like abscission. Even if all the leaves fell (rare), a single attack would not be fatal to a broad-leaved tree. In so severe a case, a fungicide should be used the next spring, as leaves open, to be sure the tree isn’t weakened by repeated attacks. Leaf spots are most abundant after rainy springs.
- Chemical injury: Effects depend on what chemical, what season, what temperature, what tree species, etc. Some chemicals discolor leaves, but

the leaves don't fall. Some cause leaf fall but do not hurt the rest of the tree (new leaves come out). Others kill trees. Once such leaves fall, it's too late. There is no treatment.

- Clusters of fallen leaves, attached to short twigs, result from a twig-girdling insect or squirrel activity. If the former, a shallow depression encircles the broken twig end just inside the bark. If the latter, the break is diagonal and might have two or three small "steps." These are rarely any threat.

And under the heading of what gardeners won't do to succeed!

Protecting Your Crop from Birds" by Bill Dailey

Over the past several years I have waited eagerly for my several grape varieties ('Canadice', 'Steuben', and 'Gewurtztraminer') to ripen fully on the vine and have taken what I thought were adequate precautions against birds by completely—or so I thought—enclosing the vines with plastic netting. However, it always seemed that the birds found their way into the nets just days before the grapes were completely ripe.

So this year I tried something different. Using one-liter clear plastic seltzer bottles, I fashioned enclosures for individual clusters of grapes. I found them to be a complete success. I cut the top of the bottle off right at the bottom of the neck, then cut a slit down the length of the bottle.

Finally, I poked several holes in the bottom to let any condensation escape. The makeshift theft deterrents were put in place when the grape clusters were still quite small. I carefully spread the bottle open and allowed the cluster to be completely enclosed, and the very top of the slit was placed on a nearby vine. The bottle closed and held on by itself. I was worried that these enclosures would be a haven for disease but found no increase in rot or other problems. An additional benefit was the amazement of neighbors and friends when they asked, "How did you get the grapes to grow in the bottles?" If anyone is interested in seeing the bottles in action, check out the Backyard Fruit Growers page at the WWW address www.sas.upenn.edu/~dailey/byfg.html and look under the picture page.

The second article, originally titled "Protecting Grapes from Birds," is by Dave Sawyer.

The birds around here are aggressive, hungry, and smart, and they will pick our berries and grapes unless we protect them. We've tried to frighten them away with scare eyes and bright pie pans (the birds weren't impressed), and we cover the berries with bird netting.

The first year we had grapes, we had bagged bunches in paper bags. I found these awkward to use. The paper is stiff, hard to position among the tangled shoots of grape vines, and we had a lot of damage from picnic beetles living in the bags.

The next year I bought fiberglass window screening, cut it into about one-foot squares, and wrapped it around the bunches, securing it with twist ties. Although this is a tedious job, it has provided excellent protection from birds.

I've seen them try to peck through the screen, but it's too tough for them. Furthermore, the flexible screening is much easier to handle than paper bags; we haven't had any insect problems inside the screens, and they can be saved from year to year. It's easy to see the grapes inside and pick just the bunches that are ripe. This is a tedious way to protect grapes, but it is effective and suitable for small plantings or vines that are just beginning to produce

Research on Insectary Plants in the Pacific Northwest

The following is adapted from two recent press releases provided by Oregon State University; for additional information, call John Luna at 541-737-5430.

Many farmers, orchardists, and organic gardeners have long been interested in planting flowering plants in and around their crop plants to encourage beneficial insects, including pollinator and natural enemy species that prey on crop pest species.

An Oregon State University graduate student in horticulture tested the relative effectiveness of 11 flowering beneficial insectary plants in attracting natural predator species of hover flies and parasitic wasps in western Oregon. "Seed catalogs and gardening books often publish lists of plants that supposedly encourage beneficial insects," explained Micaela Colley, who completed her master's degree in horticulture at OSU in April, with the guidance of John Luna, OSU assistant professor of horticulture. "Most of this information has been anecdotal, or word-of-mouth, not research-based. Our goal was to establish a scientific basis for making recommendations to growers who are interested in using plants to attract beneficial insects." Colley and Luna planted 11 species of flowering insectary plants, four types of perennials and seven annuals, at the OSU Vegetable Research Farm in Corvallis and at two organic farms in the area. Perennials studied included basket of gold, yarrow, Korean licorice mint, and fennel; annual species included alyssum, calendula, cilantro, mustard, Phacelia, marigold, and buckwheat. All plants are reputed to provide pollen and nectar to natural enemies of crop pests.

Colley chose to study the relative attractiveness of her plantings to natural predators of aphids—hover flies and tiny parasitoid wasps. Hover fly larvae eat aphids, and the wasps lay their eggs in aphids, thereby killing them. She and her OSU colleagues collected insect samples from her study plots of each type of flower through the summer of 1997 and counted relative numbers and types of hover flies and parasitoid wasps on each kind of insectary plant.

The researchers found that annual alyssum, cilantro, mustard, and buckwheat were the most attractive to hover flies overall. To the parasitic wasps, mustard, buckwheat, and Korean licorice mint were the most attractive. "These aren't absolutes," said Colley. "The insect preferences for plants were relative. The most favored plants depended on what else was in bloom or not in bloom at the time...."

Colley [also conducted] experiments on Stahlbush Island Farm near Corvallis in 1997. She compared the relative number of hover fly predators on pure broccoli stands to those interplanted with patches of alyssum or cilantro,

known attractants of hover flies. She also looked at aphid populations in stands of broccoli only compared with interplanted broccoli....

“We focused on hover flies in this study because they have the potential to control aphids,” explained Colley. “The larvae of many hover fly species are voracious aphid feeders. They feed specifically on aphids, whereas a lot of other predators are more generalists, feeding on many types of insects.” Colley and Luna found alyssum to be the most effective attractant to adult hover flies in their experiment. They found more adult hover flies and hover fly eggs in plots with alyssum than in the pure broccoli plots or plots interplanted with cilantro. Also, parasitism of cabbage aphids by a tiny parasitic wasp was nearly doubled in alyssum plantings compared to the pure broccoli stands. But they found no statistically significant differences in aphid numbers between the pure broccoli plantings and the plantings with alyssum or cilantro.

“Hover flies lay eggs in response to the presence of aphids,” said Colley. “It was a light aphid year. Aphids appeared late in the season, and hence, so did the hover flies. I think that the timing of predation by the hover flies was too late to result in measurable differences. The timing might be different in another year. If there were more aphids earlier, we may have gotten a more measurable hover fly response. Insectary plantings aren’t a ‘silver bullet.’ There isn’t an instant result like with using a pesticide. You don’t measure the effects the next day. Biological control affects a whole cycle of life over time. It’s a long-term solution.” The research still requires several more years of work before specific recommendations can be made to growers wishing to use this approach to pest management, stressed Luna....

Broccoli grower Bill Chambers, owner of Stahlbush Island Farm and collaborator with Colley and Luna, strongly believes in the intercropping concept. “We think intercropping to attract beneficial insects makes a tremendous amount of sense,” said Chambers. “The amount we have spent on interplanting has been minimal compared with the amount we would have spent on increased use of pesticides. And we are enhancing biological diversity.”

Garden Tips:

Hoorah! At last it is really time to plant our warmth-loving plants. Tomatoes, squash family, peppers, eggplant are all ready to go. Just remember, if the warm crops are transplanted into the garden by Memorial Day, they will usually give an abundant harvest. Soil temperatures below 55°F for the above crops and night temperatures below 50° F can stunt or even kill some of these. Cucumbers, eggplant and peppers are particularly fussy.

When transplanting, water well the night before, nip out the tops on fruit bearing plants and bury deeply into the soil. Ideally the transplant will be stocky, bushy and well hardened off before venturing into your garden. Lanky plants in flower frequently do not live up to their potential.

Keep deadheading your flowers for maximum production. This is especially important for annuals and rhododendrons.

Watering will be important as the hot weather comes on. Water as little as possible to maintain the soil moisture level and get the water down to just below the root system to train deep roots. Deep roots forage better for nutrients and water and are protected from temperature swings as well. Do not mulch until the soil and weather are warm and dry as early on we need to let the soil dry and warm.

Mix up the garden plants. Mixed plantings tend to be more disease and insect free. They also improve the quality of the soil life in their area. Of course, heavy water users and light users need to be segregated. Mix in flowers and vegetables and fruits for a truly pleasing and more carefree garden.

Plant many times during the season. Who needs 25' of radishes all ripe at the same time except radish root maggots?

Put a bench in your garden and enjoy it. A relaxed gardener can enjoy the garden and not worry about every stray wildling which comes along. Micromanagement is not good in your garden or your life.

Insect Information:

Nutrition Affects Susceptibility of Corn to Borer Damage

The notion that organic methods can help to promote crop resistance to pests and diseases goes all the way back to the roots (in England) of rebellion against an industrial agriculture relying heavily upon synthetic fertilizers and pesticides. Today, slogans such as “feed the soil, not the plants” and “healthy soil makes healthy plants” are common in the alternative agriculture literature. But, according to entomologist P.L. Phelan, experimental confirmation of links between organic techniques and plant health is sparse. So Phelan decided to conduct field trials designed to reveal such links. The basic idea was to compare levels of European corn borer damage to corn grown in fields with various management histories, ranging from high to low input levels of synthetic fertilizers and pesticides.

A previous greenhouse trial had shown that corn plants grown in pots of soil taken from organic farms tended to have fewer European corn borer eggs laid on them than did corn plants grown in soil taken from farms with high synthetic input levels.

It was discovered that borer egg-laying rates tended to be highest on plants having relatively low levels of protein in their leaves. The field trials showed a general relationship between plant nutrient levels and borer damage: lower levels of various nutrients are correlated with higher damage. Most significantly, the results of the field trials suggested to Phelan that pest resistance

is mainly affected by the balance of nutrients in crops—ratios of particular nutrients, rather than absolute levels—and that organically managed soils promote a desirable nutrient balance, possibly by dampening fluctuations in water and nutrient availability to plants.

Now, the question yet to be answered is how to manage the soil to optimize the balance of those plant nutrients (whichever those might be) for resistance to pests and diseases. It has taken a long time (since the 1940s!) for an academic researcher to become seriously interested in how nutrient balance impacts plant resistance to pests and diseases; the original organic theorists are being vindicated, finally. Better late than never! Reference: P.L. Phelan (Dept. of Entomology, The Ohio Agricultural Research and Development Center, The Ohio State University, Wooster, OH 44691), "Soil-Management History and the Role of Plant Mineral Balance as a Determinant 1997, 25-34. (AB Academic Publishers, P.O. Box 42, Bicester, Oxford OX6 7NW, ENGLAND.)

On the watch list now: aphids, flea beetles, codling moth, cucumber beetle. Of concern only in excessive numbers are earwigs, sowbugs and the like. Overpopulation leads them to broaden their definition of "decaying organic matter." Squashing aphids on the plant sends a signal to those insects which feed on aphids to come and get it.

Plant diversity also tends to lure in the insect helpers who feed on pollen and nectar while laying eggs which then become your own insect police force.