All events are free and open to the public.

Please email Kristar@iastate.edu.

**Thursday, October 10:**
9—10 AM: Hot Topics in Estate Planning with ISU Farm Management Specialist, Ryan Drollette

11:30 AM – 1:30 PM: **Open House!** Stop in for a tour and refreshments. Greater Muscatine Chamber of Commerce and Industry ribbon cutting at noon.

6—7 PM: Worm Bin Composting. Join Lydia Whitman, Conservation Assistant, Cedar County SWCD/NRCS to learn about worm composting. Pre-registration required, space is limited, please email Kristar@iastate.edu.

All are invited to the ISU Extension Muscatine County Open House October 10 from 11:30am until 1:30pm with the Ribbon Cutting at Noon. Set complete schedule on page 5.

Also note the Worm Bin Composting Event October 10 at 6pm. Pre-registration is required for this event. Contact Krista at kris-tar@iastate.edu or call 563.263.5701

Master Gardener Intern Training continues through November 2 — see schedule on page 4
Upcoming Meeting & Event Highlights
Coordinated by Jane Hodge, Master Gardener

As the sun was setting on our general meeting, September 10, we learned about water quality from Matt Mc Andrew. Ed Moreno then led us on a tour by his pond, around his orchard and through his gardens. Thank you, Ed, for a lovely and informative evening! See page 14 for photos

New Events

October 10 ISU Extension Open House 11:30am-1:30pm with Ribbon Cutting at Noon — see page 5 for more details of the entire week.

October 10 Worm Bin Composting 6-7pm at Extension Office; pre-registration required.

October 12 Sand Prairie Cleanup Day starting at 9am — see page 6

October 14 Monarch Mania at Port Louisa Wildlife Refuge 10am—noon — see page 3

October 15 Muscatine Garden Club Small Standard Flower Show “Autumn Brilliance” — see page 7

October 26 Fall Gardening Seminar at West Burlington — 9am-noon — see page 3

November 2 Master Gardener Intern Trainees + Members Potluck — see page 4

November 12 General Meeting at 6:30pm at ISU Extension – Nick Gow, Horticulturist for Muscatine Parks and Recreation Department, will present about the hanging baskets maintained throughout Muscatine and other horticulture issues in the City.

2020 Mini Grants Announced

From ISU Extension and Outreach October 2019
Master Gardener volunteers are building partnerships to increase access to fresh produce. In Fort Dodge, Master Gardener volunteers converted a community garden into a donation garden and donate the produce to two local food pantries.

We're excited to announce the 2020 Growing Together mini grants! Mini grants for up to $4,000 to purchase materials for donation gardens will be available. Applications are due on January 10, 2020.
Upcoming Events in Southeastern Iowa
Excerpted from Fall Gardening Seminar — West Burlington, Iowa

The Des Moines County Master Gardeners are proud to sponsor the Fall Gardening Seminar on Saturday, October 26 from 9:00 am to 12:00 pm. at SCC’s Little Theater in West Burlington. Gary Wittenbaugh will speak about Gardening with Conifers, and Rock Gardens and Their Plants.

Registration is at 8:30 am and admission is free.
Muscatine County Master Gardener Training - Fall 2019

The Master Gardener Training Program for 2019 is well underway. Thanks to Kathy Haltmeyer and Rachel Horner Brackett for all of their work on this! We welcome you to join in on any of these activities but please let Kathy or Rachel know if you are coming! Kathy will be working on mentors for our new trainees, so if you are interested in that please let her know. Please also put Saturday, November 2nd on your calendar as we plan to host a lunch potluck for the wrap-up and spend some time highlighting our current Master Gardener projects. More info to come!

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>TOPIC</th>
<th>LOCATION</th>
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</thead>
<tbody>
<tr>
<td>Monday, August 19</td>
<td>6-7:30 PM</td>
<td>Welcome session</td>
<td>Muscatine County Extension Office, 1514 Isett Avenue</td>
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<tr>
<td>Saturday, August 24</td>
<td>9 AM – 1 PM</td>
<td>Vegetables &amp; Herbs, Weed Science, Animal Ecology</td>
<td>Muscatine Island Research &amp; Demonstration Farm, The Nature Conservancy Swamp White Oak</td>
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<tr>
<td>Saturday, September 7</td>
<td>9 AM – 1 PM</td>
<td>Herbaceous Ornamentals, Plant Pathology, Soils</td>
<td>Lynn &amp; Emma May Pruitt’s home, Nichols Saulsby Recreation Area</td>
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<tr>
<td>Saturday, September 21</td>
<td>9 AM – 1 PM</td>
<td>Sustainable Landscape Design, Integrated Pest Management, Pesticides, Composting</td>
<td>Zoo Garden at Weed Park, Muscatine Pollinator Park</td>
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<tr>
<td>Saturday, October 5</td>
<td>9 AM – 1 PM</td>
<td>Turf Grass, Fruit Cultures, Landscape Trees &amp; Shrubs</td>
<td>Geneva Golf &amp; Country Club, Muscatine Arboretum, Discover Park</td>
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<tr>
<td>Saturday, October 19</td>
<td>9:30 AM – 4 PM</td>
<td>Class on Campus: Plant Pathology, Entomology, Botany</td>
<td>Iowa State University, Current Master Gardeners interested in attending must register through Iowa Master Gardeners and pay the registration fee.</td>
</tr>
<tr>
<td>Saturday, November 2</td>
<td>9 AM – 1 PM</td>
<td>Plant Propagation, House Plants</td>
<td>Muscatine High School Green house, Muscatine County Extension Office, 1601 Plaza Place</td>
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MUSCATINE COUNTY
GRAND OPENING EVENTS

October 7—11, 2019

All events are free and open to the public.

Monday, October 7:
9:30-11 AM: Join ISU Human Sciences Specialist Barb Dunn Swanson to learn about two Extension programs: A Journey through Parkinson’s Disease and What About Me? My Wellbeing.


Tuesday, October 8:
5:30-7 PM: 4-H Find Out Night. It’s National 4-H Week! Join us to learn about 4-H opportunities in Muscatine County!

Wednesday, October 9:
9 AM – Noon: Business Model Canvas 101. Join Victor Oyervides, ISU Retail Specialist, to learn about this strategic management tool created by entrepreneurs for entrepreneurs. Pre-registration required, space is limited, please email Kristar@iastate.edu.

Thursday, October 10:
9—10 AM: Hot Topics in Estate Planning with ISU Farm Management Specialist, Ryan Drollette

11:30 AM – 1:30 PM: Open House! Stop in for a tour and refreshments. Greater Muscatine Chamber of Commerce and Industry ribbon cutting at noon.

6—7 PM: Worm Bin Composting. Join Lydia Whitman, Conservation Assistant, Cedar County SWCD/ NRCS to learn about worm composting. Pre-registration required, space is limited, please email Kristar@iastate.edu.

Friday, October 11:
Noon – 1 PM: Join Abby Boysen, Family Nutrition Program Assistant, to learn more about the newly released Plan Shop Save Cook adult nutrition program for individuals on limited incomes.

Join Us
at our new location!
1601 Plaza Place

Check out the full details on the Muscatine County website.

www.extension.iastate.edu/Muscatine

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Iowa State University Extension and Outreach does not discriminate on the basis of age, disability, ethnicity, gender identity, genetic information, marital status, national origin, pregnancy, race, color, religion, sex, sexual orientation, socioeconomic status, or status as a U.S. veteran or other protected classes. Direct inquiries to the Diversity Advisor, 515-294-1482, diversity@iastate.edu. 1EV-104F April 2019.
Sand Prairie Cleanup Day — October 12, 9am

We've set a date for our Sand Prairie Cleanup Day. It is going to be Saturday October 12th starting at 9 am. Some people from Ames are coming down and bringing all of the tools and equipment needed. I'm hoping that people want to use these volunteer hours towards their Master Gardener and Master Conservationists hours. Breakfast and lunch will be provided, so hopefully that draws some people in as well.

Let me know if you have any questions or concerns. I'm asking people to RSVP so I can have enough food there. If you guys could spread the word that would be great! Fingers crossed that we have decent weather that day.

Contact: Dominic Snyder
Iowa State University Research and Demonstration Farms
Muscatine Island Research Farm
111 North Street P.O. Box 40
Fruitland, IA 52749
mobile: 712-309-2240

Muscatine Pollinator Project

A great United Way Day of Caring pollinator planting at Muscatine’s new bio-cell. Many thanks to the HNI volunteers for their support!

(per Dave Cooney’s Facebook page)

SAVE THE DATE! 2020 Art of Gardening

March 21, 2020 is the date for our next Art of Gardening. Place on your calendars! Committee meetings are starting and we could use all the “gardening” minds possible to help put on this great event! We’re meeting on Thursday evenings at 4:30 at the McAvoy Center of MCC on Park Avenue (next to the Kum & Go). Text me if you’re interested but can’t make a meeting and I’ll put you on my e-mail list. Thanks. Susan Cradick – 299-9114 or cradicks45@yahoo.com
Muscantine Garden Club
A Small Standard Flower Show
“Autumn Brilliance”

Riverview Center
Harbor Drive
Muscatine, Iowa
Tuesday, October 15, 2019
8:00am-5:30pm

Open and free to the public 1:00-5:30pm

An NGC Flower Show
Member National Garden Clubs Inc.
Federated Garden Clubs of Iowa
District 1
Forestry Field Days Planned across Iowa This Fall
September 11, 2019, 11:46 am | Billy Beck

Learn the value of trees and woodlands; connect with professionals who understand the importance of forestry

AMES, Iowa – Iowans interested in the care of trees, forests and natural resources should consider attending a forestry field day this fall, held by Iowa State University Extension and Outreach and various public and private partners.

Topics will include how to manage a forest for profit, water quality, wildlife and the aesthetic value of trees. Additional topics will include forest establishment, tree protection and invasive species control, herbicide use, forest products, portable sawmills, timber marketing and the legal aspects of forestry.

“Trees, woodlands and forests are often vastly under-utilized by Iowa landowners,” said Billy Beck, assistant professor and extension forestry specialist at Iowa State. “These forestry field days provide Iowans the knowledge and resources to harness the true power of their forests.”

Bruce Blair, an area forester with the Iowa Department of Natural Resources, said the field days will center around “edu-tainment,” providing a unique combination of information, networking and time in the outdoors.

Six field days are planned for October, with the first Oct. 1 at the Shimek State Forest in Lee County. Registration information for each event is available on the ISU Forestry Extension website, under the “Educational Opportunities” section.

Beck became the Iowa State forestry specialist in August, and said he is looking forward to meeting Iowans and talking about the importance of the state’s trees and woodlands.

Field day partners include the Iowa Department of Natural Resources, Iowa Tree Farm Program, Iowa Walnut Council, Natural Resources Conservation Service, private forestry consultants, loggers and sawmill operators, as well as private landowners.

**Forestry field day dates and locations**

- Oct. 1, [Shimek State Forest](#) (Lee County)
- Oct. 3, [Yellow River State Forest](#) (Allamakee County)
- Oct. 8, [Clear Lake Forestry Field Day at McIntosh Woods State Park](#) (Clear Lake)
- Oct. 15, [Stephens State Forest](#) (Chariton)
- Oct. 17, [Loess Hills State Forest](#) (Pisgah)
- Oct. 29, [Iowa Tree Farmer of the Year/Walnut Council Field Day](#) (Mediapolis)
Hello Greenhouse Growers!

This year our program will feature presentations delivering cutting-edge information for greenhouse growers. Specifically, our program will feature talks on: nutritional monitoring; managing and controlling root rots; sensitive sites impacted by pesticides, REI, and pre-harvest interval; consumer research; new greenhouse trends; fungicide rotations; pricing products; containerized floriculture and hydroponic food crop nutrition research updates. The cost for the Short Course (including lunch) is $60. Additionally, we will be offering Pesticide Continuing Instruction Course (C-CIC) credit for greenhouse pesticide applicators for an additional fee of $35.00.

Registration is limited to 110 people!

PLEASE CLICK ON THIS LINK TO REGISTER: http://www.aep.iastate.edu/greenhouse

Featured 2019 Speakers:
Dr. W. Garrett Owen, Michigan State University
Dr. Janna Beckerman, Purdue University
Dr. Bridget Behe, Michigan State University
Dr. Mark Shour, Iowa State University
Dr. Chris Currey, Iowa State University

Location: Reiman Gardens, Garden Room

Directions and Parking: Reiman Gardens is located southeast of the ISU campus at 1407 University Blvd, Ames, IA 50011. For directions to the entrance from the intersection of University Blvd. and S. 16 St, click on the link below or paste the url into your browser address bar.


An ISU campus map is also available online at http://www.fpm.iastate.edu/maps/

Parking is available in Lot S1 (next to the garden)
Want a homegrown flower for the holidays?

During this family oriented workshop, you will plant an amaryllis bulb that will bloom right in time for the holiday season.

**When:** 9 am Saturday, November 2, 2019.
**Where:** The Dubuque County Extension Office, 14858 West Ridge Ln. Suite 2, Dubuque, IA 52003
**Cost:** $20 per bulb and includes a bulb, pot and potting mix as well as bulb care information.
**Registration:** is required with a deadline of 4 pm October 31, 2019. Registration can be done by calling the Dubuque County Extension Office at (563) 583-6496.
**Please Note:** This is a family oriented learning activity. Parents of children are encouraged to bring their kids to make this a fun learning event. More information can be found [HERE](#) or by calling the Dubuque County Extension Office at (563) 583-6496.
News from the Chair
By Mary Danner
Master Gardener

Farewell to summer. I am not a fan of Fall; shorter days, plush green turns to rusty brown, but there will be a beautiful show soon when trees start to change with their final hurrah. I would like just one more month with June or September weather; it’s just never enough. On the plus side, there is less weeding and the air is crisp; the days can be enjoyable if the weather cooperates.

As we start to wrap up this growing season, try to get those shovels, rakes, and other garden tools cleaned off before you store for the last time. Wash off and lightly oil so they are ready to go in the spring. Even a kitchen cooking spray will do the job. Plus remember to note where you tuck in spring bulbs with a plant marker so they don’t get accidentally disturbed.

Maybe now you will have extra time to record your volunteer hours. There are more opportunities for getting a few more CEUs for our yearly requirements. The Iowa MG Newsletter had many listed, like the Fall Gardening Seminar in Burlington on Oct 26th.

Don’t forget the Open House on Oct 10th and all the events planned that week at the new Muscatine Co Extension Office. Especially the worm bin composting workshop the evening of the 10th; our local MGs group is covering the expenses for this out-reach program. That’s our fundraising efforts going to a great cause!

Take care and happy gardening, Mary

Control of Ground Ivy in Lawns
By Richard Jauron, Department of Horticulture
From ISU Extension and Outreach October 2019

Ground ivy or “creeping Charlie” (Glechoma hederacea) is a common weed in many lawns. Ground ivy is a low-growing, creeping, invasive perennial. It spreads by seeds and above-ground stems (stolons) which root at their nodes. The leaves of ground ivy are round or kidney-shaped with scalloped margins. Stems are four-sided. Flowers are small, bluish purple, and funnel-shaped. Ground ivy thrives in damp, shady areas, but also grows well in sunny locations. A member of the mint family, ground ivy produces a minty odor when cut or crushed.

Control of ground ivy in lawns is difficult. If the ground ivy is not completely destroyed, surviving portions will continue to grow and spread. Broadleaf herbicide products containing triclopyr provide the best control of ground ivy. A widely available product that contains triclopyr is 'Ortho Weed B Gon Chickweed, Clover and Oxalis Killer for Lawns.' Fall (late September through mid-November) is the best time to control ground ivy. (Spring applications are not as effective.) Two broadleaf herbicide applications are necessary to effectively control ground ivy. The first application should be made sometime from late September to mid-October. The second application should be made approximately 4 weeks later.
Zoo Garden Activities  
By Maryrose Peterschmidt, Master Gardener

Would like to invite all Master Gardner's to join us for the fall work day at the Zoo Garden.

Once again with the help from the United Way we will be joining forces with a youth group from Calvary Church. The date is **October 20th, Sunday afternoon from 1 pm to 4pm**. This is a good way to pick up a few more hours. We will be cleaning out the beds, cutting back perennials, digging up Cannas and elephant ears. Putting down mulch for winter protection. Please bring your own tools that day. Any questions please call me.

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Pictures from last Saturday Coffee at Zoo Garden

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Muscatine Branching Out  
By Kathy Chalupa, Master Gardener

Muscatine Branching Out update. We only have a few trees not spoken for: crabapple, beech, and zelkova.

Contact muscatinebranchingout@gmail.com for information.
Master Gardener Training — September 7

All eleven Master Gardener Trainees plus Instructors Rachel Horner Brackett and Kathy Haltmeyer attended the 2nd class at the Pruitt’s on September 7 with the focus on Ornamental Herbaceous Perennials. In addition to touring the gardens, several took ownership of excess gardening books from the Extension Office, and also watched a video of the Pruitt gardens at their prime in early July.
About 20 Master Gardeners and guests were welcomed royally for our September General Meeting at the beautiful country home of Ed and Carol Moreno. Matt McAndrews presented an interesting program on Watershed Protection and Water Quality.
The Hy-Vee Main Street Donation Garden still has the potential for a little more 2019 produce but Day of Caring Volunteers from HNI worked hard along with director Nancy Dew to get it ready for winter and next spring.
Church of Christ Donation Garden

Day of Caring Clean Up with excellent help from Kent Feeds Volunteers + some of our final produce deliveries to Food Bank. We were blessed with over 2,200 pounds this year!
Yard and Garden: Planting Spring-Flowering Bulbs
ISU Extension and Outreach == September 11, 2019 | Richard Jauron, Willy Klein

AMES, Iowa – October is the best time to plant tulip and other spring-flowering bulbs. Make your selections and purchase bulbs, then follow the planting recommendations of ISU Extension and Outreach horticulturists to color your spring garden with floral beauty. To have additional questions answered, contact Hortline at hortline@iastate.edu or 515-294-3108.

When is the best time to plant tulips?

October is the ideal time to plant tulips, daffodils and other spring-flowering bulbs in Iowa. When planted in October, spring-flowering bulbs have sufficient time to develop a good root system before the ground freezes in winter. If the weather permits, tulips and other spring-flowering bulbs can be planted as late as late November.

What are good planting sites for tulips?

Tulips perform best in full sun. Planting sites should receive at least six hours of direct sun each day. Tulips also need a well-drained, fertile soil.

How deep should I plant tulips?

Plant spring-flowering bulbs at a depth equal to three to four times their maximum bulb diameter. Accordingly, plant tulip bulbs 6 to 8 inches deep. Space bulbs 4 to 6 inches apart. Plant tulips and other spring-flowering bulbs in clusters or groups to achieve the greatest visual impact in the garden. When planting tulips, plant 10 or more bulbs of the same cultivar in an area.

Which tulips bloom over the longest number of years?

Most modern tulip cultivars bloom well for only two or three years. However, there are some tulip types (classes) that bloom well over a longer time period.

Darwin hybrid tulips are generally the longest blooming hybrid tulip. Darwin hybrid tulips may bloom for five years or more when planted in favorable locations and given good care. Darwin hybrid tulips are prized for their large, brilliant flowers. Flowers are available in shades of red, pink, orange, yellow and white. Blooms are borne on stems that are up to 30 inches tall. Darwin hybrid tulips bloom in mid-spring.

Fosteriana tulips also perennialize well. They are noted for their large, elongated flowers. Flowers appear in early spring on 10- to 20-inch-tall stems. Foliage is typically green or gray-green. However, a few cultivars have mottled or striped foliage. Fosteriana tulips are also known as Emperor tulips. Species tulips are generally the longest-lived tulips. Some naturalize when given favorable growing conditions. Species tulips include wild tulip species and cultivars developed from these wild species. Species tulips are usually smaller than modern tulips. They also have smaller flowers. Species tulips are excellent choices for rock gardens and in the front of beds and borders. They are also sometimes referred to as botanical tulips.

Photo credit: hcast/stock.adobe.com.
Gardeners who plant gardens, flower beds, trees and shrubs are always excited as they plan for everything and have visions of how beautiful your plantings are going to look. Then, issues occur among our plants from either disease or pests, but also from a weak plant that will not survive. Proper diagnosis of plant problems is a key factor in solving plant health. “As master gardeners, treatment without diagnosis, as in medicine, is malpractice.” Despite this, diagnostics is often not given adequate attention.

Typically, diagnosing is a process to come up with the best possible explanation of why plants have problems. Unfortunately, there is not always a simple solution. Removing a small portion of the problem area to examine it closely provides us a chance to see if it is a pest or a disease.

If the plant problem is an insect pest and the pest is present, a quick and accurate diagnosis can be made by simple pest identification. For example, diagnosing what is causing leaves on little leaf linden to become skeleton-like with only the veins remaining is relatively easy if Japanese beetles are swarming the tree.

You should always remain aware that a plant may be suffering from multiple problems, and the most obvious may not be the most significant. Your diagnostics should follow a systematic approach to finding proper treatment, and the place to begin is to consider the questions that must be answered. You do not necessarily need to know the answers to all the questions, nor do you have to ask them in order. Often, however, failure to accurately answer some of the early basic inquiries at the start is the reason for the faulty diagnosis.

Plants are variable enough that what is perfectly healthy for one plant may be a sign of a serious problem for another. A good example can be found in deciduous conifers such as bald cypress, dawn redwood, and larch. These three trees bear cones and needles, and you may think they are evergreens. However, they are indeed deciduous, with fall colors ranging from spun gold to reddish brown, followed by leaf drop. The total browning of foliage on bald cypress would be a sign of almost certain death on a pine. A good example of this issue is found at the Mercy Family Medicine Clinic where a Bald Cypress is growing.

A common problem on crabapple trees is fire blight, caused by the bacteria, causes a blighting of shoots that result in discolored leaves and a curling of the shoot. This symptom is helpful in considering fire blight as a possibility. However, such symptoms can also be caused on many plants by far simpler problems, such as moisture stress, resulting in leaf and shoot wilting.

Be aware that some plant pathogens and plant pests have other hosts, so two very different plant groups may be affected by the same problem in different ways. The fungus produces large, reddish-brown plant galls that sprout fungal horns on the stems of junipers. On apple leaves, the fungus produces round, lipstick-red leaf spots. The common name for this disease

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reflects the two hosts: cedar-apple rust.

Fungus are not the only gall-makers. There are several insects and mites that direct the growth of plant galls, and most are highly specific to their hosts. Indeed, most are so specific the gall-maker can be identified to species based on the gall structure alone without the need to see the actual gall-maker. What do you see that looks abnormal?

Now take note of the condition of surrounding plants. Are other specimens similarly affected? What is their general health? If you are looking at a grouping of a particular species, does symptom severity seem to relate to any kind of gradient of drainage or sun exposure? Trying to answer such questions often provides key clues about major environmental factors. If, for example, a number of different vegetables in a garden are all dying, it is unlikely they are deteriorating from an infectious disease since most disease-causing pathogens have limited host ranges. It is more likely that some environmental factor, such as extended flooding or poor soil conditions, is involved.

Often noticing what is occurring on overhanging plants can prevent embarrassing misdiagnoses. Scale insects, which suck sap from plants, excrete this processed sap out the other end in the form of “honeydew.” Often this clear, sugary, sticky liquid becomes covered with a sooty mold fungus that simply grows on the sugary substance, rather than plant tissue itself. Calico scale is a prolific producer of honeydew. Consider what happens to the leaves of plants underlying a tree that is heavily infested with this scale insect. The underlying plants are not infested; however, their leaves become blackened with sooty mold. Of course, an effective treatment must focus on the scale infestation rather than non-infested plants with blackened leaves.

### 7 Steps to Diagnosing Plant Problems

1. **Observe**
   Try to visit your garden daily and get to know what your plants look like when they’re healthy — so you’ll notice any problems right away. When you do see something out of the ordinary, stop for a closer look. What caught your eye? Off-color foliage? Holes in the leaves?

   If you want to avoid using poisons in your garden, the key to success is taking time to look closely. It’s the single most important action you can take. Here are a couple questions to get you started:

2. **Name That Plant**
   **What kind of plant is it?** Some types of plants are particularly susceptible to certain pests or disease problems. Sometimes you’ll see signs, such as shiny slug trails, without seeing the actual culprit.

3. **Do the Leaves Appear Eaten?**
   The culprit might be an insect, slug or animal pest. Large holes in the middle of the leaf can indicate beetles, caterpillars and slugs. Shredded foliage or plants eaten right down to the ground might be the work of an animal, such as a deer or woodchuck.

4. **Are the Leaves Discolored?**
   **If so, how?** Silvery, bronzed or stippled foliage may indicate the presence of plant juice-sucking insects such as aphids and spider mites. Pale or mottled leaves can indicate an environmental or nutrition problem.

5. **Are there Spots on the Leaves?**
   **They may be caused by a disease.** But they can also be the result of insect feeding or environmental factors. Some plants are notorious for their susceptibility to certain diseases.

6. **Look for the Culprit**
   **Do you see insects, eggs or droppings?** Some insects are difficult to see but they...
leave telltale signs. For example, some cabbageworms are so well camouflaged you may not see them, but you'll see their black droppings. Eggs may be clustered on the undersides of leaves or on new growth, so be sure to look there, too.

Keep in mind that the insects you see may not be causing the symptoms. Ants, for example, are sometimes found on damaged plants and are assumed to be the culprit. But they generally don't harm plants — they're after the honeydew (a sugary secretion) left by the real pests, usually aphids. Other insects, such as lacewing or ladybug larvae are beneficial insects that may already be busy solving the problem by hunting down the pests.

7. **Look for Other Signs and Symptoms**

Examine plants for anything out of place. Some pests are so tiny you're unlikely to see them, but on close inspection you'll see signs of their presence. For example, spider mites are smaller than a pinhead but reveal their presence with the silky webbing they produce. Though slugs feed at night and usually hide out during the day, the shiny slime trails they leave behind are telltale "footprints."

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If it's the end of the growing season, control may not be warranted. If, on the other hand, it's early in the season and the plant is at risk, you may need to act quickly. Diseases pose different challenges. Most products that control diseases are preventative — they won't cure a disease but can keep it from spreading. You may also be able to keep a disease problem in check by removing and destroying affected leaves or parts of the plant.

Remember that many pests and diseases can be kept in check with good gardening practices. Pesticides and fungicides — even organic ones — should always be a last resort.

**Yellow Leaves and Nutrient Deficiencies**

"Why are my plant's leaves yellow?"

If you're like most gardeners, you've faced this befuddling question before. Leaf yellowing — known as "chlorosis" in the world of science — has many potential causes. But one of the most common is undernourishment.

For healthy development, plants require 16 different micronutrients and macronutrients. And if they don't get them or if proportions are imbalanced, leaves may start to look strange, become more susceptible to disease, and slow (or even stop) their growth — decreasing yields.

**Symptoms of Plant Nutrient Deficiencies**

Before you can address a deficiency, you've got to be able to figure out which nutrient your plant needs. So here are a few ways a plant may show you it's missing something important:

- **Calcium** – Leaves are disfigured and may wilt or show signs of necrosis (i.e., death of plant tissue).
- **Copper** – Leaves may be limp and/or curled.
- **Iron** – New leaves turn a pale, yellow color between green leaf veins (this is known as interveinal chlorosis).

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- **Magnesium** – Leaves show spotting and yellowing between green leaf veins. Outer edges of leaves may pucker or curl.
- **Manganese** – Younger leaves turn yellow between veins (giving them a net-like look) and may develop dead spots.
- **Nitrogen** – Older leaves and veins turn a pale, yellow color. Other leaves turn light green and stay smaller than normal.
- **Phosphorus** – Leaves looks stunted and turn dark green or even a deep purple color (almost black for some plants). Leaf tips may look burnt.
- **Potassium** – Older, lower leaves show marginal necrosis, even looking scorched around the edges. Leaves also yellow on edges and between veins.
- **Sulfur** – New leaves yellow and leaf veins lighten while older leaves remain green. (May be confused for a nitrogen deficiency.)
- **Zinc** – New leaves yellow and may develop necrosis between veins.

**How to Fix Nutrient Deficiencies**

The best way to solve deficiencies is to avoid them in the first place by giving your plants the nutrients they need.

For soil-based gardeners, that means using fertilizers, rich compost, and other amendments. But if you’re growing vegetables, all you really need is a simple, balanced mix of all the key nutrients.

**Other Causes of Discoloration and Disfigurement**

Nutrition isn’t the only reason a plant’s leaves may look unusual. Here are a few other common causes.

**Pests and Plant Diseases**

Because bad bugs not only damage and stress plants — they also often introduce the following types of plant diseases, which bring additional harm:

- **Bacteria** – Bacterial diseases can cause wilting and spotting.
- **Fungi** – Some leaf fungi mimic certain symptoms of nutrient deficiencies, including yellowing and necrosis.
- **Virus** – If you see blotchy or patchy yellowing on your leaves, a virus may be the responsible (especially if the discoloration is accompanied by disfigured growth).

We had three articles on each of these this year.

**Over (or Under) Watering**

One of the most common, non-nutrient-related causes of yellow leaves is over or under watering. But if you’re growing your plants in soil, here are a couple of ways to determine whether you should adjust your watering schedule:

- **Check the soil.** (I know — it’s basic. But it’s never a bad idea.) If it’s drenched, it may be waterlogged, robbing plant roots of the oxygen they need to survive. In this case, **water less.**
- **Look for dropped leaves.** Plants that don’t receive enough water drop leaves to prevent transpiration (i.e., the evaporation of water from plant leaves). So if you see leaves on the ground, **water more.**

**Environmental Factors**

Your growing environment can impact how your plants grow. Here are a few elements to consider.

**Light** — When accompanied by thin, reaching stems, pale leaves usually suggest a plant isn’t receiving enough light. Most plants need at least six hours of direct sun.

On the other hand, newly transplanted crops may develop bleached spots on their leaves after too much sun exposure. To avoid this, harden seedlings by gradually introducing them to the outdoors over the course of a few weeks.

Similarly, when growing inside, leaves that get too close to grow lights may become spotted.

*Continued next page, DIAGNOSING*
or scorched due to over-transpiration, which is followed by yellowing, spotting, and, eventually, leaf death.

**Temperature** — Extreme heat often causes plants to wilt. But they usually bounce back once temperatures cool. That being said, **these precautions** can help protect your plants from hot weather.

If you notice black spots on leaves or plants after a cold snap, frost damage is likely the cause. Some plants — particularly kale, collards, and other hardy greens — can survive light frosts. More sensitive crops, such as tomatoes and peppers, however, usually die after freezing weather.

**Wind** — If leaves look dry around the edges and/or curl upward, they may be suffering from windburn. Consider setting up a wind barrier to protect them.

**Time** — It’s completely normal for older, more mature leaves of a plant to yellow and die over time (as long as new, green leaves are replacing them). Just remove these old timers as you see them to prevent leaf fungi.

We have offered multiple potential means of examining plant issues for gardeners.

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**Kathy Haltmeyer & Mary Danner volunteered helping in a craft booth for the kids, making flowers with bees on them ‘pollinating’. It rained & it was pretty muddy but fun.**

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**3rd Annual Swamp Stomp at Arden Creek Winery September 22**
Muscatine County Extension Office
1514 Isett Avenue
Muscatine, IA  52761-4629
563-263-5701 or 800-992-0894

Krista Regennitter
Muscatine County Extension Director
Master Gardener Liaison
... and justice for all

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( ) Year term expires as of Dec. 31
* Going off Board Dec 31, 2019/2020 but eligible for re-election

Current Emails and Addresses

As a reminder – keep both the Extension Office and Lynn Pruitt current on any changes of e-mail addresses, phone numbers, or mailing addresses. These need to be current to keep you — our members — informed.

Fall Flowers add Color and Texture

Editorial Comments:

Please remember, this is YOUR newsletter. Your articles, photographs and other tidbits are welcome. Send them by the end of each month to pruitt.lynn@gmail.com or call 563.260.0234

— Lynn Pruitt, Editor —