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Japanese Beetles on the rise or fall, but still there

Japanese beetles were accidentally introduced to the United States in 1916 by way of New Jersey. Since that time, they have become one of the most devastating landscape pests in the eastern United States. As little as 10 to 15 years ago, Missouri was somewhat free of this critter with only a few scattered pockets of beetles being found in a few counties. Presently, they appear in most Missouri counties and annual counts (by county) can be monitored through the Integrated Pest Management website at: <http://ipm.missouri.edu/pestmonitoring/jb/viewall.cfm>

Large areas of turfgrass and pastures provide desirable habitat for developing grubs with no effective natural enemies. Grassed levees around crops of corn and soybeans in river bottoms may lead to destruction of these plants. Needless to say, we have abundant habitat for this particular insect and numbers this year are being reported above and below last year's numbers. We are not sure as to why some areas have lower numbers than last year. Perhaps dry weather is a factor.

While the grubs are damaging to several plant roots (turfgrasses included), the adults beetles also feed on 300 to 400 plant species. Listed in table 1 are just a few plants likely to be damaged by Japanese Beetles. Lindens and roses seem to be the most popular. Some lindens (*Tilia tomentosa* 'Sterling' and *Tilia Americana* 'Legend') are less susceptible than other lindens. Some cultivars of crabapple (*Baccata* v. *jackii*, Jewelberry, Harvest Gold, and Louisa) are relatively resistant. Information for tables 1 & 2 can be found at the Cooperative Extension Service, University of Kentucky, Entfacts 451.

Adult beetles are 3/8" long, metallic green beetles with copper-colored wing covers. White tufts of hair protrude along the underside of the wing covers. This is a dead-ringer characteristic for Japanese beetle. Adult beetles will usually start their feeding at the top of a plant and work their way down. Adults will feed on the upper side of

leaves between leaf veins giving a skeletonized appearance. Odors from damaged leaves may serve as an attractant for drawing more beetles to desirable food sources. Adults can be highly mobile, up to several miles; however, most will make short flights to feed or lay eggs. There is no guarantee that adults will lay eggs in and around a site where they feed.

Egg laying begins immediately following emergence in the spring and mating. Clusters of beetles can be noticed on vegetation during the early day, usually in full sunlight. Females fly down later in the day to burrow 2 to 3 inches into the soil to deposit 40 to 60 eggs (mid to late June). Egg hatch occurs in July and grubs grow very quickly, achieving nearly full size by August. Grubs continue to feed on roots of turfgrasses and other plants in home lawns, gardens, parks, golf courses, and cemeteries. Soil moisture is important for the survival of eggs and small grubs during the summer months. Females prefer moist

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Table 1. Plants Favored by Japanese Beetles.

Scientific name	Common name
<i>Acer palmatum</i>	Japanese maple
<i>Acer platanoides</i>	Norway maple
<i>Aesculus hippocastanum</i>	Horsechestnut
<i>Althaea rosea</i>	Hollyhock
<i>Betula populifolia</i>	Gray birch
<i>Castanea dentata</i>	American chestnut
<i>Hibiscus syriacus</i>	Rose-of-Sharon, Shrub Althea
<i>Juglans nigra</i>	Black walnut
<i>Malus species</i>	Flowering crabapple, apple
<i>Platanus acerifolia</i>	London planetree
<i>Populus nigra italicica</i>	Lombardy poplar
<i>Prunus species</i>	Cherry, black cherry, plum, peach, etc.
<i>Rosa species</i>	Roses
<i>Sassafras albidum</i>	Sassafras
<i>Sorbus americana</i>	American mountain ash
<i>Tilia americana</i>	American linden
<i>Ulmus americana</i>	American elm
<i>Ulmus procera</i>	English elm

soils to lay eggs. Irrigated lawns, sports fields, and golf courses will often have higher grub populations, especially during droughty periods. Older grubs move deeper into the soil profile where moisture exists, becoming more tolerant of droughty conditions.

Most individuals are familiar with white grub damage. Root pruning by grubs will create brown patches of dead turf that easily pulls up and separates from the soil. Many often refer to it, "like rolling up a carpet." Early lawn damage from feeding grubs includes slightly discolored patches that may be sunken and beginning to wilt. These normally show up in late July to early August, but some years as late as September. This is when to investigate the existence of grubs in these patches and treat when numbers reach 5 to 10 per square foot.

Damage reduction and control can be accomplished several ways. Just as we listed plants susceptible to adult beetles, we also have a list of plants that are less likely to be damaged by adult Japanese beetles. They are listed in table 2.

Selection of less desirable landscape species is a good first step to plant selections in Japanese beetle infested areas. Removing beetles by hand may provide some protection for small plantings when numbers are low. However, the presence of beetles left unscathed will only attract more beetles. Shaking small plants is one way to

remove beetles. Protecting small plants with cheese cloth is another.

Many garden centers sell traps. Sex attractant hormones lure beetles to the traps and can attract thousands of beetles a day. Unfortunately, research indicates that traps attract far more beetles than are actually caught. If traps are used, place them far away from landscape plants and gardens.

Several over-the-counter and commercial insecticides are labeled for adult and larval (white grub) Japanese beetles. Products containing pyrethroids such as cyfluthrin (Bayer Advanced Lawn & Garden Multi-Insect Killer), acelepryn (Acelepryn), bifenthrin (Talstar One, Onyx), clothianodin (Arena), deltamethrin (Deltagard), imidacloprid (Merit),

Table 2. Less Susceptible Plants to Japanese Beetles.

Scientific name	Common name
<i>Acer negundo</i>	Boxelder
<i>Acer rubrum</i>	Red maple
<i>Acer saccharinum</i>	Silver maple
<i>Buxus sempervirens</i>	Boxwood
<i>Carya ovata</i>	Shagbark hickory
<i>Cornus florida</i>	Flowering dogwood
<i>Diospyros virginiana</i>	Persimmon
<i>Euonymus species</i>	Euonymus (all species)
<i>Fraxinus americana</i>	White ash
<i>Fraxinus pennsylvanica</i>	Green ash
<i>Ilex species</i>	Holly (all species)
<i>Juglans cinerea</i>	Butternut
<i>Liriodendron tulipifera</i>	Tuliptree
<i>Liquidambar styraciflua</i>	American sweetgum
<i>Magnolia species</i>	Magnolia (all species)
<i>Morus rubra</i>	Red Mulberry
<i>Populus alba</i>	White poplar
<i>Pyrus communis</i>	Common pear
<i>Quercus alba</i>	White oak
<i>Quercus coccinea</i>	Scarlet oak
<i>Quercus rubra</i>	Red oak
<i>Quercus velutina</i>	Black oak
<i>Sambucus canadensis</i>	American elder
<i>Syringa vulgaris</i>	Common lilac
Most evergreen ornamentals, including <i>Abies</i> (fir), <i>Juniperus</i> , <i>Taxus</i> , <i>Thuja</i> (arbor vitae), <i>Rhododendron</i> , <i>Picea</i> (spruce), <i>Pinus</i> (pine) and <i>Tsuga</i> (hemlock) are not attacked.	

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lambda-cyhalothrin (Scimitar, Spectracide Triazicide), permethrin (Spectracide Bug Stop Multi-Purpose Insect Control), and thiamethoxam (Meridian) offer good control for professionals and homeowners. Carbaryl (Sevin) is also effective for both adults and grubs. Pyrethroid products will provide 2 to 3 weeks protection, while carbaryl provides only 1 to 2 weeks protection. For those wanting an organic approach, Neem products like Azatrol or Neem-Away will provide 3 to 4 days deterrence of feeding. Sequential applications of all products may be needed under extended periods of activity. Always follow label directions and note any precautions for bees. On food crops, follow the recommended pre-harvest interval before harvest begins.

Predicting the outcome of such a large outbreak of Japanese beetles is difficult. Since adult beetles are quite mobile, controlling grubs in a lawn may not protect landscape plants from adult feeding. Because you notice

adult beetles in your landscape, does not necessarily mean that you need to treat a lawn. Treating landscapes plants will offer some protection from adult beetles when noticed. Perhaps the best approach for lawns is one of, "wait and see." Others will want to treat immediately.

Reference:

Japanese Beetles in the Urban Landscape, M.F. Potter, D.A. Potter, and L.H. Townsend. University of Kentucky Cooperative Extension Service – College of Agriculture, EntFact 451.

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Daylily: America's Favorite Perennial

Few garden flowers give so much pleasure while "asking" for so little as does daylily. In the quest most gardeners pursue for a "no maintenance" plant, daylily is about as close as one can get. Indeed, it often is mused that "daylilies thrive on neglect". Couple their ease of care with the myriad of flower colors, types and sizes available and it is little wonder why daylily is America's most popular perennial flowering plant. June is the month most daylily cultivars are at their best and a great time to enjoy this colorful, carefree plant.

Daylily belongs to the genus *Hemerocallis*. The latter is derived from the Greek words *hemera* (day) and *kalos* (beautiful), and makes reference to the fact that the showy flowers of this plant rarely last for more than 24 hours. Taxonomic authorities recognize 18 separate species of *Hemerocallis*. Unlike other members of the *Liliaceae* (lily) family daylily does not grow from a bulb. Instead, it produces fleshy roots that serve as a repository for food reserves. Daylily is a clump-forming plant with strap-like leaves that vary in size according to cultivar. Its flowers are perfect and in parts of three, as is the case with most monocots.

Daylily is considered to be native to China, Japan and Korea. The first written record of daylily dates back to 2697 B.C. and indicates Chinese ancients used it as a source of food and for its perceived medicinal properties. The latter included using daylily to solve a range of problems from relieving pain to uplifting the spirit. Indeed, in Chinese literature the word for daylily and "forget-worry" are synonymous.

Later, daylily was taken to Asia Minor where, in 70 A.D., the Greek herbalist Dioscorides made reference to a species of *Hemerocallis* that still is grown today. Over the years, daylily continued to be touted for its medicinal properties and was mentioned in several European herbals in the 16th century under a variety of (now-obscure) names such as *Lilium non-bulbosum*. Daylily was assigned its current botanical name in 1753 by the Swedish naturalist Linnaeus.

By the late 1800's many daylily species could be found in American gardens. However, it was the work of geneticists and plant breeder Dr. Arlow B. Stout that started daylily on the path to the popularity it enjoys today. Dr. Stout, considered to be the father of the modern daylily, received plants and seeds from China in 1924 and began a program of breeding and improvement. His work not only resulted in the development of hybrid daylily cultivars but also produced an understanding of the genetics of the genus *Hemerocallis*. The work of Dr. Stout did much to encourage both professional and amateur plant breeders to hybridize daylily. Their efforts have resulted in an astounding 72,092 daylily cultivars registered by the American Hemerocallis Society according to its 2011 database.

Such a multitude of cultivars requires the use of a sizeable glossary when attempting to describe daylily flowers and distinguish one cultivar from another. Terms such as single, double, spider, circular, flat, informal, triangular, star and recurved are examples of a few of the

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many terms used to describe flower form. Additionally, flower color and/or pattern are described by terms such as self, blend, polychrome, bi-tone, bicolor, watermark and eye zone. A complete listing of terms associated with daylily can be found at the following web address: http://www.daylilies.org/ahs_dictionary/dictionary.html.

Although it has been said that daylilies thrive on neglect, the fact is that proper care will produce more robust and attractive plants and flowers. Daylily is a full-sun plant and should be located where a minimum of six to eight hours of direct sun is received daily. However, a bit of late afternoon shade does help to preserve flower color and longevity. In shady exposures abundant foliage but very few flowers are produced.

Daylily prefers a medium-heavy garden loam, although it can tolerate a wide array of soil textures. Soil of any texture should be improved by incorporating liberal amounts of organic matter in the form of well-rotted manure, compost or peat moss before planting. Good soil drainage is important for optimum growth and performance; however, daylily will survive in extremely dry or excessively moist conditions. Plants growing in the latter easily succumb during severe winters even though the same conditions are tolerated during the summer.

Like any plant, daylily requires nutrients but additional fertilizer should be applied sparingly since too much nitrogen can be detrimental. Daylilies growing in very rich soils require little (if any) additional fertilizer. In average garden loams the application of a complete fertilizer such as 5-10-5 in the spring of the year when new growth starts usually is adequate. In extremely poor soils or soils that leach easily, a follow-up application of fertilizer might be warranted. When applying fertilizer, avoid spreading it on the leaves of the plant. This can lead to the accumulation of fertilizer at the base of the leaf and result in tissue burn when the fertilizer is wetted. Soil pH should be maintained around 6.5 for optimum nutrient availability.

As previously stated, daylily is fairly drought-tolerant. However, adequate amounts of water result in an increase in both flower number and size. Water especially is important in the spring when the plants are forming scapes and setting buds and, later, when plants are in bloom. Thorough (deep) watering that penetrates eight to ten inches into the soil is preferred over frequent, light watering. Overhead watering during the day can cause open flowers to spot and wilt. Therefore, if applied overhead, watering early in the morning is best.

Daylily is subject to attack by a variety of pests and diseases but most do only minor damage. Aphids, thrips and spider mites are the most common insect pests. Crown and root rot, leaf streak and daylily rust are diseases that can be problematic. Proper sanitation including the removal of garden debris at the end of the growing season can help to prevent pest problems.

Weeds can be controlled through the use of mulches which also help to preserve soil moisture. If organic mulches are used the improvement of soil structure is an added benefit.

As do most clump-forming perennials, daylilies require periodic division for best garden performance. The frequency of division depends largely on cultivar and growing conditions. Cultivars known for their reblooming tendency such as 'Stella de Oro' should be divided relatively frequently. This helps to force new growth throughout the growing season which is the primary factor that causes a daylily to rebloom. Daylilies can be divided (or planted) any time the ground is not frozen; however, late August through September is the most ideal time.

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View MEG Publications on the web

<http://ipm.missouri.edu/newsletters/megindex.htm>



Turfgrass & Ornamental Field Day

Division of Plant Sciences - CAFNR
University of Missouri



July 10, 2012
South Farm Research Center, Columbia, MO

Registration and Check-In starts at 7:30 a.m.
Coffee and Donuts as well as Lunch included

Topics to be covered include:

"Large Evergreen Trees: What can we grow?"
Chris Starbuck

"Preventive measures for large patch control in zoysiagrass."
Dan Earlywine

"Application strategies for improved control of brown patch in tall fescue."
Lee Miller

"MU soil testing & plant diagnostic service to the Turf & Ornamental Industry."
Manjula Nathan

"Control of crabgrass on creeping bentgrass putting greens by using preemergence herbicides."
Xi Xiong

"Help evaluate over two dozen recent introductions to the ornamental plant world."
David Trinklein



Lobenstein Scholarship Fundraiser

We will once again have a raffle to support the Lobenstein undergraduate scholarship. Tickets will be selling for \$5 for one chance or \$20 for five chances. There were some very impressive items on last years raffle so come with a little cash so you don't miss out. If you would like to donate items for the raffle to help support turfgrass education please contact Lee Miller by email at turfpah@missouri.edu or by phone at 573-882-5623.



Full Schedule of Events and
Registration can be found at
<http://motoc.org>

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MoTOC
Missouri Turfgrass & Ornamental Council

July Gardening Calendar

Ornamentals

- **Week 1:** Deadhead bulbs and spring flowering perennials as blossoms fade.
- **Week 1** Watch for bagworms feeding on many garden plants, but especially juniper and arborvitae.
- **Week 1:** Thin seedlings to proper spacings before plants crowd each other.
- **Weeks 2-4:** Plant tropical water lilies when water temperatures rise above 70 degrees.
- **Weeks 2-3:** When night temperatures stay above 50 degrees, bring houseplants outdoors for the summer.
- **Weeks 2-3:** Apply a balanced rose fertilizer after the first show of blooms is past.
- **Weeks 2-3:** Rhizomatous begonias are not just for shade. Many varieties, especially those with bronze foliage do well in full sun if given plenty of water and a well-drained site.
- **Weeks 2-3:** Most houseplants brought outside prefer a bright spot shaded from afternoon sun. Check soil moisture daily during hot weather.
- **Weeks 2-3:** Apply organic mulches as the soil warms. These will conserve moisture, discourage weeds, and enrich the soil as they decay.
- **Weeks 2-3:** Apply a second spray for borer control on hardwood trees.
- **Weeks 3-4:** Softwood cuttings can be taken from trees and shrubs as the spring flush of growth is beginning to mature.
- **Weeks 3-4:** Continue spraying roses with a fungicide to prevent black spot disease.
- **Weeks 3-4:** Tired of the same old foundation plantings? Find fresh ideas among the evergreens planted in the Dwarf Conifer collection.
- **Weeks 3-4:** Trees and shrubs may still be fertilized before July 4th.
- **Weeks 3-4:** Pruning of spring flowering trees and shrubs should be completed before the month's end.

Lawns

- **Weeks 1-4:** Water turf as needed to prevent drought stress.
- **Weeks 1-4:** Mow lawns frequently enough to remove no more than one-third the total height per mowing. There is no need to remove clippings unless excessive.
- **Weeks 1-4:** Gradually increase the mowing height of zoysia lawns throughout the summer. By September, the mowing height should be 2 to 2.5 inches.
- **Weeks 1-4:** Mow bluegrass at 2 to 3.5 inch height. Turfgrasses growing in shaded conditions should be mowed at the higher recommendations.
- **Weeks 1-2:** Zoysia can be fertilized now while actively growing. Do not exceed 2-3 pounds of actual nitrogen fertilizer per 1000 sq. ft. per year.

Vegetables

- **Weeks 1-4:** Blossom-end rot of tomato and peppers occurs when soil moisture is uneven. Water when soils begin to dry; maintain a 2-3 inch layer of mulch.
- **Week 1:** To minimize insect damage to squash and cucumber plants, try covering them with lightweight floating row covers. Remove covers once plants flower.
- **Week 2:** Dig potatoes when the tops die. Plant fall potatoes by the 15th.
- **Weeks 3-4:** For the fall garden, sow seeds of collards, kale, sweet corn and summer squash as earlier crops are harvested.
- **Weeks 3-4:** Set out broccoli, cabbage, and cauliflower transplants for the fall garden.
- **Week 3:** Sweet corn is ripe when the silks turn brown.
- **Week 3:** Keep cucumbers well watered. Drought conditions will cause bitter fruit.
- **Week 3:** Harvest onions and garlic when the tops turn brown. Sow seeds of carrots, beets, turnips, and winter radish for fall harvest.
- **Weeks 1-4:** Cover grape clusters loosely with paper sacks to provide some protection from marauding birds.
- **Week 1:** Prune out and destroy old fruiting canes of raspberries after harvest is complete.
- **Week 1:** Blackberries are ripening now.
- **Weeks 2-3:** Apply second spray to trunks of peach trees for peach borers.
- **Weeks 3-4:** Early peach varieties ripen now.
- **Week 4:** Thornless blackberries ripen now.

Gardening Calendar supplied by the staff of the William T. Kemper Center for Home Gardening located at the Missouri Botanical Garden in St. Louis, Missouri. (www.GardeningHelp.org)