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Eriophyid Gall Mites

Plant galls have fascinated botanists for over 1000 years and have been used in medicine, industry, and as human food. They are found on all plant parts and resemble spectacular spiny balls, grotesque horns, exquisite vases, clubs, elongated polyps, or other impressive shapes, often in vivid yellow, magenta, or scarlet colors. Galls are induced by many types of organisms, including viruses, bacteria, fungi, nematodes, insects, and mites. Many North American galls are found on trees in the Fagaceae family, which includes oaks, chestnuts, beeches, etc. In contrast, legumes host most galls in South America, Africa, and India, while more than half of the known galls are on eucalyptus trees in Australia. In some cases galls are harmless, while others, others cause loss of flowering, fruiting, or plant death.

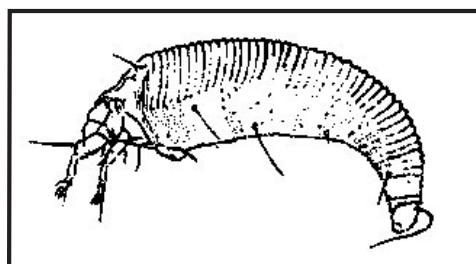
Perhaps some of the least studied, but most interesting galls are caused by Eriophyid mites (Figure 1). While the galls are conspicuous, mites that induce altered plant growth are easily overlooked. Eriophyids are pale yellowish to nearly translucent and small (0.1 to 0.3 mm-long), with only four segmented fore legs on their elongated body (Figure 2). Overwintering females (deutogynes) deposit 50 to 100 eggs each in the spring or early summer. Two types of nymphs develop before adults (protogynes) breed. Galls are induced by mite feeding. Leaf-feeding mites attach their anal sucker to the plant tissue and arch their body before inserting their mouthpart (chelicerae)

in a sucking position for a few hours to two days before moving to another feeding site.

The plant response to feeding can occur within ten minutes of feeding on leaves. Callose thickenings (composed of glucose) form along the plant cell wall at the puncture site. Within 20 minutes, nucleus enlargement and other changes occur in the punctured cell, followed by denaturation of the nuclear DNA within 45 minutes of feeding. Surrounding cells divide and form a nutritive layer which supplies food for the actively breeding mite colony. Some eriophyid mites induce brilliantly-colored, densely matted hairs called erinea, which provide food and shelter for the colony.

Eriophyid mites can also transmit plant viruses. For example, *Cecidophyopsis ribis*, a currant bud mite found in the Pacific Northwest a virus causes currant reversion, which eliminates fruit production. If galls are bothersome

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From: <http://www.fs.fed.us/r10/spf/fhp/leaflets/Erimit.htm>

into the leaf with forward movements. After feeding for as little as 10 seconds, a foliar mite can remain motionless



From: Michele Warmund

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in ornamental plantings, they can be removed and destroyed during the growing season to eliminate mites on that specific tissue. Some eriophyid mite species can be suppressed with ultrafine horticultural oil applied in the fall before leaf drop to reduce adults seeking overwintering sites. However, these products will not remove galls. For

fruit trees, miticides are available with recommendations for application listed on the label.

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New Bedding Plants for 2012

Again this year plant breeders have provided gardeners with a plethora of new bedding plants for their yards and gardens. Listed below is sampling of some of the new flowering annuals and perennials for 2012. Most should perform well under Missouri conditions.

Agastache 'Summer Sunset' (*Agastache hybrid*). With warm, sunset-orange hues this plant can brighten your summer borders and containers. The newest in the Summer™ Series, this hummingbird-mint has an upright, compact habit. It blooms all summer, is drought tolerant and is loved by hummingbirds.

Angelonia 'Archangel Purple' (*Angelonia angustifolia*). 'Archangel' Angelonia has the largest size flowers of any Angelonia. This new color in the 'Archangel' series is a perfect combination of delicate mini-orchid looking flowers, but tough as nails.

Angelonia 'Serena Blue' (*Angelonia angustifolia*). This care-free, continuous bloomer is well-suited to landscapes, gardens and mixed containers, and performs well under a wide range of conditions. The durable Serena series is a perfect choice for gardeners looking for water-wise, heat-loving plants. Extremely easy to grow and low maintenance. It grows best in full-sun settings but does not tolerate drying down completely between watering.

Begonia 'Amour' (*Begonia boliviensis*). The most vigorous trailing begonia on the market, 'Amour' is perfect for large patio pots and hanging baskets because it grows quickly and trails from any container. The dark foliage on 'Amour' makes the vivid red flowers stand out.

Begonia 'Fairyland' (*Begonia semperflorens*). This attractive compact fibrous-rooted begonia has consistently double flowers. Blooming at an early age,

the new 'Fairyland' Begonias have more consumer retail appeal than their single flowering counterparts. Begonia 'Fairyland' performs equally well in a pack or in a pot. In the garden 'Fairland' adds durable and season long color to combination pots, as a specimen on the patio or in landscape plantings.

Begonia 'Santa Cruz Sunset' (*Begonia boliviensis*). Begonia 'Santa Cruz Sunset' is very heat tolerant. It thrives in well-drained soil and can handle moderate drought once it is established. Fiery red-orange blooms cover the plant from late spring until frost. The well branched plant looks full and lush in a pot or hanging basket by itself or in a garden with a rainbow of colors.

Begonia 'Whopper Red with Bronze Leaf' (*Begonia hybrida*). Producing huge plants with large blooms and shiny foliage, it make a bold statement in any garden settings. 'Whoppers' are ideal for gardeners of all skill levels because they require minimal maintenance.

Coleus 'Wasabi' (*Solenostemon scutellarioides*). Versatile and rugged, Wasabi's brilliant color and serrated leaves hold up in sun or shade without fading or spotting. Wasabi provides a perfect chartreuse background for hot pinks and intense purples in the garden or container.

Coleus Fuseables™ 'Under the Sun' (*Solenostemon scutellarioides*). This new coleus blend combines multiple seeds of two varieties into one easy-to-sow pellet. 'Under the Sun' captures the great color combination of 'Versa Crimson Gold' and 'Versa Lime'. Its maroon-red and gold leaves contrast nicely with chartreuse. When mature, it fills containers in an attractive manner that will accent any

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

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patio or deck. 'Under the Sun' tolerates full sun as well as partial shade.

Dahlia 'Dahlinova Hypnotica® Cherish Pink' (*Dahlia X*). 'Dahlinova Hypnotica® Cherish Pink' is one of the latest introductions in the Dahlinova Hypnotica® series. Cherish Pink has a large bi-colored flower and excellent branching. The great garden performance of this long-flowering variety is one of its benefits. One cutting easily fills a gallon or an 8-inch pot.

Dahlia 'XXL Veracruz' (*Dahlia hybrida*). Dahlias have always been a dramatic addition to a garden or patio, but with the introduction of Dahlia 'XXL', the curtain has opened on a whole new act. 'XXL Veracruz' is just as its name suggests, a large-flowered dahlia, with blooms boasting almost 6 inches in diameter. What is different, though, is that these striking flowers grow on a plant that doesn't get out of control in the garden. Nor will it need staking or extra care to maintain the plant structure.

Echinacea 'Aloha' (*Echinacea hybrida*). Wide, melon yellow petals surround orange cones on this summer-to-frost bloomer. 'Aloha' is a welcoming and elegant plant that greets you with its fragrance and beauty. Use en masse for the border, in a mixed bed, or as a cut flower.

Echinacea 'Double Scoop Bubble Gum' (*Echinacea purpurea*). The 'Double Scoop' series of Echinacea have eye-catching double flower power for the garden. They are very hardy and offer years of enjoyment. Gardeners will love their clean foliage and brilliantly colored blooms.

Echinacea 'Sombrero Salsa Red' (*Echinacea purpurea*). The new 'Sombrero' series of Echinacea have bright, rich color and long bloom life. Gardeners will enjoy how well 'Sombrero' branches and grows on sturdy stems. With proven hardiness for years of enjoyment in the garden, it is drought tolerant and very floriferous.

Gaillardia 'Red Sun' (*Gaillardia x grandiflora*). Having broad petals, flowers of this plant have the appearance of "sun-like" orbs of hot orange-red floating over the mounded foliage of this drought-tolerant perennial. 'Red Sun' is tolerant of poor soil and the hottest sun.

Gaillardia 'Sundance Red' (*Gaillardia pulchella*). Compact plants bloom from summer to fall with red, puffball blossoms held above the foliage creating a blaze of color. Ideal for containers, flower beds and wildflower gardens, the heat and drought tolerant plants bloom from summer to fall. The flowers make a nice long lasting cut flower and plants are deer resistant.

Hibiscus 'Mahogany Splendor' (*Hibiscus acetosella*). This new plant should have tremendous impact in the summer garden. It produces beautiful maple-leaved foliage with a deep burgundy color. Its shiny, tall plants

have a distinctive Japanese maple look and glow in the sun, adding color and texture to the landscape in perfect order with the ornamental grasses. 'Mahogany Splendor' does well in very wet soil conditions.

Impatiens 'Accent™ Premium Red' (*Impatiens walleriana*). The 'Accent™' series is noted for its large, high quality blooms and strong garden performance. They satisfy well the growing trend towards larger plants and containers that can provide instant color and fill in the garden.

Impatiens SunPatiens 'Spreading Carmine' (*Impatiens x hybrida hort*). SunPatiens 'Spreading Carmine' is an ideal choice for hanging baskets and containers. Fast growing and easy to care for, it grows well in full sun, partial shade or full shade. This variety is outstanding in hot and humid conditions that would cause regular Impatiens "melt". Its strong plants also tolerate all types of weather, holding up well to wind and rain. Three seasons of performance means this variety will brighten a porch or patio from spring all the way through a light frost.

Kale, flowering 'Song Bird™' F1 (*Brassica oleracea*). The 'Song Bird' series of flowering kale brings color to fall and winter gardens. Plants color when temperatures fall below 55 - 60°F creating colorful rosettes of leaves, looking like a large, exotic flower. Ideal for gardens and containers, its plants are 8 to 12 inches tall, and 12 to 14 inches wide.

Leucanthemum 'Bridal Bouquet' (*Leucanthemum x superbum*). Here is a new, super-compact Shasta daisy without the "Shasta smell". Its flowers are lightly ruffled, double and broad-petaled. As an added interest, they emerge bright yellow and turn white with maturity.

Marigold 'Bonanza Deep Orange' (*Tagetes patula*). The double-crested flowers of 'Bonanza Deep Orange' are the largest of any in this type of French marigold. In the garden, the plants are excellent performers under a wide range of conditions. As with most marigolds, its low-maintenance nature is appealing to busy gardeners.

Marigold 'Lofty Lady' F1 (*Tagetes erecta*). You may never have seen a marigold this tall—it towers a striking 4 feet in height. Additionally, plants explode with dazzling yellow 4" blooms on very long stems. Ideal for vases, blooms impart distinctive marigold fragrance.

Nepeta 'Purple Haze' (*Nepeta hybrid*). This wonderful hybrid catmint will be a fabulous addition to any sunny garden. 'Purple Haze' forms a silver mat with purple blue flower spikes that look like Buddleias. The plants are clean-looking and bloom all summer long. Maintenance is rarely needed because it never gets messy. Very versatile,

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it can be used in the front of borders and mixed beds, as a ground cover on banks, or in a rock garden.

Ornamental Corn ‘Field of Dreams’ (*Zea mays*). With highly variegated green and white foliage with touches of rose, ‘Field of Dreams’ adds color and structure to large combination pots and accents in the landscape. Plants can reach four to five feet tall and produce ears that are as attractive after the season as the plants were beautiful during the season. The dark kernels can be popped to add even more interest to this exciting new introduction.

Ornamental Pepper ‘Black Olive’ (*Capsicum annuum*). An AAS for 2012, this new ornamental pepper is a standout. Heat tolerant, it is well-suited for typical Missouri conditions. All season long this beauty keeps its upright habit with nicely draping leaves and dark purple/black fruit which appeared in small clusters along the stems. As summer progresses, the fruits mature to red giving a beautiful contrast against the dark purple foliage and bright purple flowers. Growing to a height of 2-inches, it can be used as a border plant, a great color splash for containers or as a cut flower in mixed bouquets.

Petunia ‘Shock Wave Coral Crush’ (*Petunia x hybrida*). The ‘Shock Wave’ petunia series produces a mounded, spreading plant that is easy to grow and maintain. They exhibit excellent outdoor performance and offer the strong, season-long color that the Wave family varieties are known for. They perform equally well in small spaces, hanging baskets, containers and mixed combos. ‘Shock Wave Coral Crush’ is bright coral pink with a creamy throat for added interest.

Petunia ‘Whispers™ Star Rose’ (*Petunia hybrida*). ‘Whispers Star Rose’ explodes with color. Plants are covered in bright pink, star-patterned blooms all season long. ‘Whispers Star Rose’ exhibits a strong trailing habit that is ideal for hanging baskets and combination planters.

Salvia ‘Summer Jewel Pink’ (*Salvia coccinea*). A 2012 AAS Winner, this new introduction is a sister to earlier AAS winner Salvia ‘Summer Jewel Red’. Its compact plants bloom prolifically throughout the growing season. As a bonus, the blooms appear almost two weeks earlier than other pink salvias. As with other salvias, hummingbirds love them.

Verbena ‘Lanai® Twister Pink’ (*Verbena hybrida*). ‘Lanai Twister Pink’ is truly one of a kind. This variety displays unique pink-and-white bicolor flower heads contrasted by rich green foliage. The award-winning ‘Lanai’ series has been recognized for its “Best in Class” garden performance at independent trials across the United States. ‘Lanai Twister Pink’ is a heat lover that will thrive throughout summer’s heat and humidity.

Vinca Jams ‘N Jellies Blackberry’ (*Catharanthus rosea*). Velvety deep purple with white eye flower color causes this new vinca to add excitement to summer gardens. In some settings, the flower petals appear almost black, making this color a designer’s delight. The 2-inch flowers are complimented by deep green shiny leaves creating a rich background for the richly dark flowers. A superb accent plant, it works beautifully in color combinations with blue, pink, white or lavender. Easy-to-grow plants have excellent tolerance to drought and heat. Mature plants reach a height of 10-14 inches.

Credit: National Garden Bureau

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March Gardening Calendar

Houseplants

- **Weeks 1-4:** Two handsome houseplants that provide fragrant blossoms indoors this month are the Confederate Jasmine (*Trachelospermum jasminoides*) and Japanese Pittosporum (*Pittosporum tobira*). Both thrive in average home conditions and are easy plants to grow.
- **Weeks 1-4:** As day lengths increase, plants begin new growth. Repot root bound plants, moving them to containers 2 inches larger in diameter than their current pot. Check for insect activity and apply controls as needed. Leggy plants may be pruned now.

Ornamentals

- **Weeks 1-4:** Trees, shrubs and perennials may be planted as soon as they become available at local nurseries.
- **Weeks 1-4:** To control Iris borer, clean up and destroy the old foliage before new growth begins.
- **Weeks 1-4:** Loosen winter mulches from perennials cautiously. Re-cover plants at night if frost returns. Clean up beds by removing all weeds and dead foliage at this time.
- **Weeks 1-2:** Heavy pruning of trees should be complete before growth occurs. Trees should not be pruned while the new leaves are growing.
- **Weeks 3-4:** Ornamental grasses should be cut to the ground just as the new growth begins.

Lawns

- **Weeks 1-4:** Mow lawns low to remove old growth before new growth begins.
- **Weeks 2-4:** Apply broadleaf herbicides now for control of cool-season perennial and annual weeds. These must not be applied to areas that will be seeded soon.
- **Weeks 2-4:** Apply controls for wild garlic. It will take several years of annual applications for complete control.
- **Weeks 3-4:** Thin spots and bare patches in the lawn can be over seeded now.

Vegetables

- **Weeks 1-4:** Any root crops such as horseradish, parsnips, Jerusalem artichokes, or carrots still in the ground from last year should be harvested before new green top growth appears.
- **Weeks 1-4:** Fertilize the garden as the soil is being prepared for planting. Unless directed otherwise by a soil test, 1 to 2 pounds of 12-12-12 or an equivalent fertilizer per 100 square feet is usually sufficient.
- **Weeks 1-2:** Delay planting if the garden soil is too wet. When a ball of soil crumbles easily after being squeezed together in your hand, it is dry enough to be safely worked.
- **Weeks 2-4:** Plant peas, lettuce, radishes, kohlrabi, mustard greens, collards, turnips, Irish potatoes, spinach and onions (seeds and sets) outdoors.

Fruits

- **Weeks 1-4:** Gradually remove mulch from strawberries as the weather begins to warm.
- **Weeks 1-3:** Continue pruning apple trees. Burn or destroy all prunings to minimize insect or disease occurrence.
- **Weeks 3-4:** Aphids begin to hatch on fruit trees as the buds begin to open.
- **Weeks 3-4:** Apply dormant oil sprays now. Choose a dry day when freezing temperatures are not expected.
- **Weeks 3-4:** Spray peach trees with a fungicide for the control of peach leaf curl disease.
- **Week 4:** Mulch all bramble fruits for weed control.
- **Week 4:** Peaches and nectarines should be pruned just before they bloom.

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)