Learning to live with Fuchsia Gall Mites

Peter R. Baye
Ph.D. Botanist,

Fuchsia gall mites are still a perennial challenge for fuchsia growers. They are especially a problem coastal California's climate, where populations of this pest are permanently established in both derelict and well-maintained gardens alike. There is little chance of eliminating fuchsia gall mites from this region because each local infestation serves as a source population to spread gall mites to other susceptible fuchsia cultivars. It is likely that the innumerable infested fuchsia shrubs in old derelict plantings provide permanent refuges for the gall mite, waiting to be spread by hummingbirds or humans. The practical question for the fuchsia grower is how to live with fuchsia gall mites.

For most gardeners who are casual fuchsia growers (not hard-core fuchsia fanatics), horticultural use of fuchsias has devolved to a disposable annual hanging basket plant. The short-term cultivation of fuchsias is an unsatisfactory strategy for beating the fuchsia gall mite life-cycle, at least for dedicated gardeners who want the pleasure of seeing a treasured specimen trained and develop over years. Disposable fuchsia gardening also dispenses with much of the ornamental value of fuchsias inherent in large standards or shrubs.

At the opposite end of the spectrum, some fuchsia fanatics reach for the magic "silver bullet" for fuchsia gall mite: synthetic systemic pesticides. It is true that they can work like magic charms, but in more ways than desired. In traditional lore, magic comes at a cost to its users. This is quite true of systemic pesticides, which work by poisoning the plant's sap, making the entire plant chronically toxic. The labels of systemic pesticides carry fine print, which almost nobody reads if the product works as desired by the gardener, warning of hazards of exposure to fish and wildlife, as well as humans. The labels warnings are legal requirements of pesticide use, but in practice they are seldom heeded or enforced.

Why should the fuchsia grower be concerned about wildlife toxicity of systemic pesticides applied to fuchsias in private gardens with little access to wildlife? Hummingbirds. Hummingbirds and fuchsias are inseparable in nature and in cultivation. Hummingbirds and fuchsias evolved together. It is a meaningful metaphor to say that the ultimate goal of fuchsia flowers is to attract and feed hummingbirds, as the folk art in Fuchsia Lore displays will attest. It is ironic – or even perverse – that this beautiful and natural relationship between bird and flower is literally poisoned in chemical warfare against gall mites.

Pesticide manufacturers do not test toxicity of their products on hummingbirds feeding on fuchsias. They test their products toxicity on substitute "proxy" species easily raised in captivity, like quail. Fuchsia growers who apply systemic pesticides to fuchsias that are accessible by hummingbirds are risking contribution to the cumulative "body burden" of pesticides and other toxins to which hummingbirds are exposed. Of course, humans also expose themselves to risks of pesticides, especially during measuring, mixing, application, and handling plants.

Using systemic pesticides on fuchsias is a personal choice, of course. My own view is that systemic pesticides are literally and figuratively a "poison pill", creating toxic beauty that I can't ignore. I get the same sense of disgust from "chemical lawns" made to look like plastic-perfect turf by intensive use of herbicides, pesticides, and synthetic fertilizer. Their superficial attractiveness is ruined for me by the real specter of pesticide toxicity. The image of luminous fuchsia flowers filled with potentially poisoned nectar seems grotesque to me. It largely eliminates my horticultural respect for the grower and my appreciation of the unblemished plant.
Pesticides that do not have systemic action are sometimes used on fuchsias as well. Fuchsia growers dating back to the 1970s may remember, as I do, the miticide kelthane (a component of several brand-name pesticide formulas used to combat gall mites). I confess I willingly used it in my ignorant youth. Like many home-use pesticides initially considered safe enough for retail sale based on limited research, this one was banned as more evidence of harm and risk of toxicity to humans and wildlife accumulated. There are even more pesticides still in use today that seem to follow the same trend – legal and safe one decade based on limited data, unsafe and banned in the next decade as more evidence accumulates.
But what are the alternatives to pesticide use to manage fuchsia gall mites? Many fuchsia growers are understandably not content to forsake the rich diversity of mite-susceptible fuchsia cultivars and grow only the relatively narrow selection of mite-resistant species and cultivars.
The choice to manage fuchsia gall mites without resorting to toxic synthetic pesticides can be laborious and frustrating, but also a rewarding challenge -- a test of will and skill for the gardener. A fuchsia garden maintained with no synthetic pesticides and few gall mite blemishes is a highly admirable achievement indeed, especially in California.
There is no simple organic "magic bullet" for fuchsia gall mites. The organic "magic" for gall mite management is a mix of skillful observation, basic gardener's knowledge of the mite life-cycle (estimating how long eggs take to hatch out during the growing season), sanitation, and careful timing of treatments to kill gall mite adults, juveniles, and eggs. Each gardener can fine-tune and adapt some simple and effective principles to control gall mite. Experienced gardeners who raise vegetables or fruit trees will recognize these pest control principles as well-tested and familiar horticultural wisdom. Gall mites are basically similar to other garden pest mites in terms of practical biological pest control. They just have different symptoms.

SUGGESTED GUIDELINES FOR MANAGEMENT OF FUCHSIA GALL MITE WITHOUT SYNTHETIC PESTICIDES

Practice quarantine and sanitation for new fuchsias. New fuchsias in the garden are one of the main sources of new infestations. Even unblemished fuchsias with no visible symptoms of gall mites may be "carriers" – sources of adults, juveniles, or eggs that may be ticking time-bombs for a population explosion of fuchsia gall mite. It takes up to several weeks for gall mite symptoms to appear in new growth, depending on temperature and plant growth rates. Only new growth is affected by gall mites. Fully developed leaves and flowers are not affected.
Newly acquired fuchsias should have a quarantine period before being permanently planted or placed near other fuchsias in your collection. The quarantine period

should depend on temperature. Gall mites seem to grow and develop more slowly at very cool temperatures in winter, and eggs are slower to hatch out when cool, too. Most eggs are likely to hatch within a couple of weeks, so if even you wipe out all crawling juvenile or adult gall mites with "knock-down" sprays of soap, alcohol, or oils, some eggs may survive and hatch out after you stop treating the fuchsia. A follow-up or preventive "knock down" spray (see below) to kill stragglers is a good precaution.

Practice winter dormant sanitation. Gall mites overwinter on your dormant fuchsias in the cool winter as relatively inactive adults or eggs. Early winter in California is a good time to reduce or eliminate mite populations at the low point of their activity and numbers.

When your fuchsias go dormant or enter periods of annual minimal growth, **prune** them back as hard as you or they can tolerate, and remove all leaves, twigs, loose bark, and even a thin layer of topsoil. Pick up any leaves that may have fallen into the container or on the ground. Apply **dormant oil sprays**, such as ordinary canola or mineral oils mixed in solution with a drop of glycerine soap or insecticidal soap (each gardener has his or her preference for dormant oil spray formulas) at least twice before buds begin to sprout on pruned shoots. Oil sprays work by smothering live mites and eggs, cutting off their oxygen. Oil sprays are a very old-fashioned and effective general pest control method for woody plants. Commercial dormant oil sprays work well, but experimenting with "home brew" dormant vegetable oil sprays can be rewarding.

Lime-sulfur dormant sprays (calcium polysulfate), though a bit stinky (rotten egg/sulfur smell), are also good supplemental controls for gall mites as well as harmful fungi in the garden.

Though diluted oil sprays can be used on growing plants, there is a risk of "burning" foliage and flowers with even diluted "summer oil sprays", especially if they are exposed to warm temperatures or sunlight, depending on local climate conditions. Careful experimentation with diluted "summer oil" sprays is worth trying as a method of sanitation or pre-emptive control of fuchsia gall mites – preferably on a duplicate or non-favorite fuchsia specimen for many weeks before you apply the technique to your whole collection.

Inspect fuchsias frequently and regularly for initial symptoms of gall mite infestation. Many inexperienced gardeners react to pest infestation only after they have become so large and conspicuous that potentially effective control methods are likely to be overwhelmed and fail. This is really a failure of observation rather than the control method. All pest infestations are more feasible to control if they are detected at the earliest stages of infestation – small, localized colonies of pests that have not had time to disperse far or in large numbers. I find it both a duty and a pleasure to inspect fuchsias. Frequent inspection should not be an unwelcome chore for the fuchsia gardener.

Unless you have microscopic vision, you will not actually see fuchsia gall mites themselves. If you do see mites, they are likely another species of true mite, like two-spotted mite or red spider-mite. Fuchsia gall mites are most likely to be detected by their initial symptoms on new growth. If you see well-developed galls (twisted and deformed shoots, leaves, flowers), you can be confident that the mites have built up

a substantial population of eggs, juveniles, and reproductive adults well beyond the parts of the fuchsia that exhibit galls. If you attack only the visible galls, you will be battling the front of gall mite invasions where they were, rather than where they are!

Rapid response to initial, early-stage infestations. Early detection needs to be matched with prompt and thorough treatment of fuchsia gall mite infestation. Gall mites tend to concentrate on soft tissues near young, growing shoot tips, but they can disperse (travel, crawl) over other, older leaves and shoots in the vicinity. Liberal pruning of the infested plant is the first step to control. "Spare the shears and spoil the fuchsias" –
the more potentially infested unpruned shoot growth you leave on the plant, the more likely you are to leave "refugee" mites to survive another day.

Salvaging lost gall mite battles. What are the options for infested plants, past initial stages? This is a strategic choice for the gardener. If there is a large collection of fuchsias at risk, disposal of the infested plant to minimize risk of spread may be justified. If disposal is not an acceptable option (it often is not for uncommon cultivars or treasured old specimens), vigorous pruning of the plant – even "hard pruning" of all shoots and foliage, at the cost of delaying or losing seasonal flowering display – is a prudent but difficult choice. The more young foliage you leave on the plant, the more chances there are for mite "refugees" to survive and re-infest the plant. The pruned plant should immediately be treated with a "knock-down" organic spray recipe (see next). A dormant oil treatment to the hard-pruned plant is another good option to kill "refugee" mites and eggs.

Repeated application of "knock-down" organic spray recipes. There are many, many non-synthetic alternative substances that have strong pesticide activity on fuchsia gall mite adults and juveniles. Some, like naturally toxic **Neem oil**, are sold commercially in garden stores. Others are common household substances that have very acute, harsh, but short-term lethal impact on contact with mites. Water solutions of **rubbing alcohol** (ethyl or isopropyl alcohol) and **liquid soaps** (glycerine or coconut oil soaps), as well as commercial insecticidal soaps (potassium salt forms of soap) are acutely lethal to mites as contact poisons. There are many, many suggested "home brew" recipes in circulation among gardeners, recommending different concentrations and different substances. I leave it to other AFS members to exchange "home brew" mite-killing recipes that they have found effective and safe for their fuchsias.

Soap and alcohol have little residual impact on mites or their eggs, so they must be re-applied at intervals to match the emergence of new juvenile mites from eggs. Rubbing alcohol at 50% dilution or less is a potent contact desiccant (dries out the mite) with very low toxicity to the plant, and in most cases can be re-applied safely more frequently than once a week. A small amount of liquid soap added, sufficient to prevent the spray from beading up as droplets on the leaf (spreading it out as a wet film) greatly enhances the "knock-down" impact of alcohol on mites.

The population control issue with all pesticides treatments, whether synthetic or organic, is that a single application of any lethal treatment is likely to leave a few "refugees" – either eggs, juveniles, or reproductive adult mites – that survive the single "knock-down" treatment and slowly re-infest the plant. You have to

compensate for this inherent limitation of incomplete mortality. You will almost never kill all mites and eggs unless you take the "poison pill" of systemic synthetic pesticides.

Repeat treatments of the organic "knock-down" spray at **intervals of at least about one week to ten days**. **It is the repetition of the treatment at proper intervals, rather than the "magic bullet" toxicity of the spray, that is effective in suppressing or gradually eliminating gall mite populations.** In other words, it is the treatment **regimen**, not the type of treatment itself that matters most for pest management. Diligence is more important than toxicity itself; even low-toxicity treatments like soap and alcohol can be highly effective at pest control in a proper regimen. Well-timed repeat spray treatments should eliminate most of the adult mite survivors and new juveniles emerging from eggs that weathered the previous spray treatment.

Make sure that spray coverage is complete, focusing on the most sheltered parts of the plant's interior branches and leaf undersides. Think like a mite refugee: where would a mite go or place its eggs to avoid water and sprays? Don't casually spray the upper surface of the plant.

To prevent soap, alcohol, or other substances from "burning" fuchsia leaves, avoid spraying in direct sunlight or high temperatures, and wash leaves off with sprays of clear water an hour or so after treatment.

After all is said and done about fuchsia gall mite control, a reality check is still needed. The feasibility for control of gall mites at any particular location depends very much on the neighborhood and some circumstances that will remain beyond your control. The number, size, and proximity of gall-mite infested fuchsias in the neighborhood, and the activity of hummingbirds, are very important factors for "immigration pressure" – dispersal of gall mites into the garden from neighborhood fuchsias. The infestation pressure from the neighborhood, alas, is outside the control of the individual gardener. Being a good fuchsia garden educator to your neighborhood is possibly the best thing you can do for your own garden, and it's surely the best thing you can do as a fuchsia society member, too. Help your neighbors tend neglected infested fuchsias with environmentally healthy methods, and do yourself, your neighbors, and neighboring wildlife a big favor.