

Friday, May 13, 2016

The Pesticide-Free Rose Garden

Author's note: This is the most important blog I have written. I am advocating a new way of growing roses; contradicting the conventional wisdom set forth in virtually every rose book of the last century, including, most recently, the "2015 American Rose Annual".

I have received excellent encouragement and advice, over the last two years, from Applied Bio-nomics in British Columbia, Rincon-Vitova Insectaries in California, and the IPM director of Butchart Gardens in British Columbia.

I know there are others trying to do what I advocate with varying degrees of success but, to my knowledge, there is nothing in the rose literature that provides instructions on how to grow roses organically, with beneficial insects and predatory mites completely taking the place of pesticides.

It is my intention to change the way roses are grown. This is not a perfect process and it requires patience to let nature take her own course, given what we've all had drilled into our heads about pesticides. But I can say conclusively that growing roses organically works, based on my experience of the last two years, plus the growing body of evidence from organic farming practices globally.

Please join me in this adventure. You will be pleasantly surprised and rewarded for your efforts and patience. I will be writing about this often and I encourage your questions and observations.

The Pesticide Culture

I grew up in a rose garden; beautiful and full of pesticides. I remember the acrid smell, as my dad "dusted" his roses with fungicides and insecticides. And, of course, that meant we were all breathing the poisonous dust. Making matters worse, ours was just one of three neighborhood rose gardens, within less than 100 feet of each other in Detroit, and everyone was doing the same thing. My dad even had a crank duster that spewed out the pesticides, and he wore no protection. Here's a picture of F.F. Rockwell, author of "The Rockwell Complete Book of Roses", dated 1963, which has been one of my rose "bibles", showing us how to do exactly what my dad did in the 1940s and '50s, with no protection but his hat and his pipe! (Note the cloud of dust right in front of his face.)



I have a collection of rose books, some of which date back to the 1930s and 40s, and they all say virtually the same thing about the need for pesticides. Here's what McFarland and Pyle said in their 1937 classic, "How to Grow Roses":

"There is only one cure for insects which eat the flowers and leaves; that is to poison them. It is, therefore, necessary that the poison be on the leaves before the insect starts to chew. Since there is no way of knowing when an insect wants to dine on a rose leaf, the only way to prepare for him is to keep poison on the plant all the time."

Notice they don't recognize that there may be good bugs and bad bugs; just kill them all. But what about all the butterflies, lace wings, lady beetles and the hundreds of different varieties of pollinating bees and wasps?

Lest you believe that anything has changed in the nearly 80 years since that book was written, please note that the only article devoted to rose care in the *2015 American Rose Annual* (which is essentially a pretty travelogue of rose gardens) is "How to Improve Performance of Pesticides: Timing, Coverage and Frequency". Plus, at the beginning of the Annual, the American Rose Society endorses seven pesticides. Here are excerpts from that pesticide article (by a Ph.D no less):

"Pesticides such as insecticides, miticides and fungicides are commonly applied by rosarians to control insect and mite pests and diseases. In fact, roses require extensive inputs from pesticides in order to maintain the aesthetic quality of both the foliage and flowers.... Examples of systemic insecticides that may be used on roses include acephate (Orthene), imidacloprid (Merit) and thiamethoxam (Flagship)...." (Emphasis mine)

So nothing has changed. In fact, things may have gotten worse. Here we have an article in the "2015 American Rose Annual" telling you to spray Orthene, an organophosphate, which is one

of the most dangerous insecticides on the market (i.e. it kills everything that touches it, like bees, butterflies, lacewings, lady beetles etc.), and imidacloprid, the Bayer neonicotinoid, which is strongly implicated in bee colony collapse disorder and is already banned in several countries.

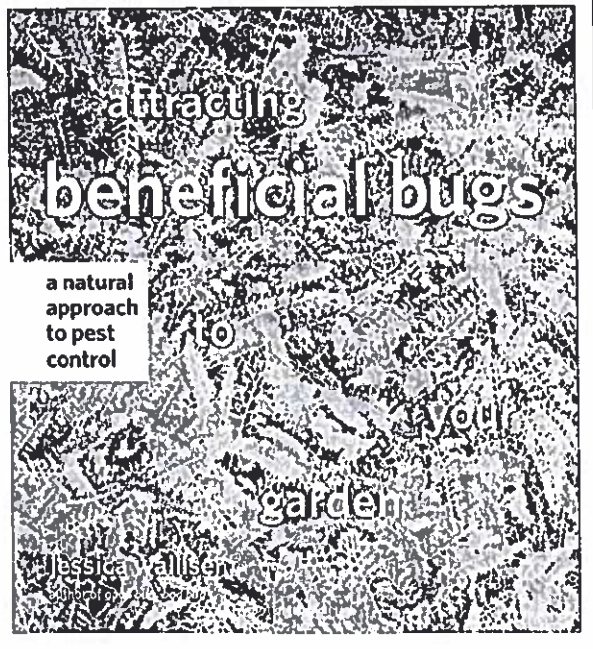
What's happening here is that we, as rosarians, have been consistently told that all insects are bad and must be killed, in order to grow beautiful roses. Nothing could be further from the truth!

Spray Nothing!

I finally realized, after many years of spraying all of the above, including Orthene, imidacloprid and pyrethroids like Demand CS (which is what I thought I was supposed to do to control everything from aphids to Japanese beetles), that what I was really doing was wiping out every naturally occurring beneficial and predator insect in my garden, not to mention pollinators like bees and wasps. For example, I suddenly realized that I no longer saw lady beetles and lacewings, which are natural predators for spider mites. It's no wonder because, instead of tediously picking Japanese beetles off my plants and drowning them in soapy water, I sprayed them with Demand CS, which works really well, but also wipes out all other beetles (like lady bugs), as well as every other predatory insect in the garden. As a result, I ended up with a massive infestation of aphids (something I hadn't seen in years) because I had destroyed all their predators, in my efforts to deter Japanese beetles.

About two years ago, my compatriot-rosarian friend Paul Zimmerman mentioned a new book by Jessica Walliser, "Attracting Beneficial Bugs to your Garden", which changed my way of thinking about controlling insect pests in my gardens. Here's a link to that book, which is available in many public libraries, as well as both new and used on Amazon:

http://www.amazon.com/Attracting-Beneficial-Bugs-Your-Garden/dp/1604693886/ref=sr_1_1?ie=UTF8&qid=1417916500&sr=8-1&keywords=attracting+beneficial+bugs+to+your+garden



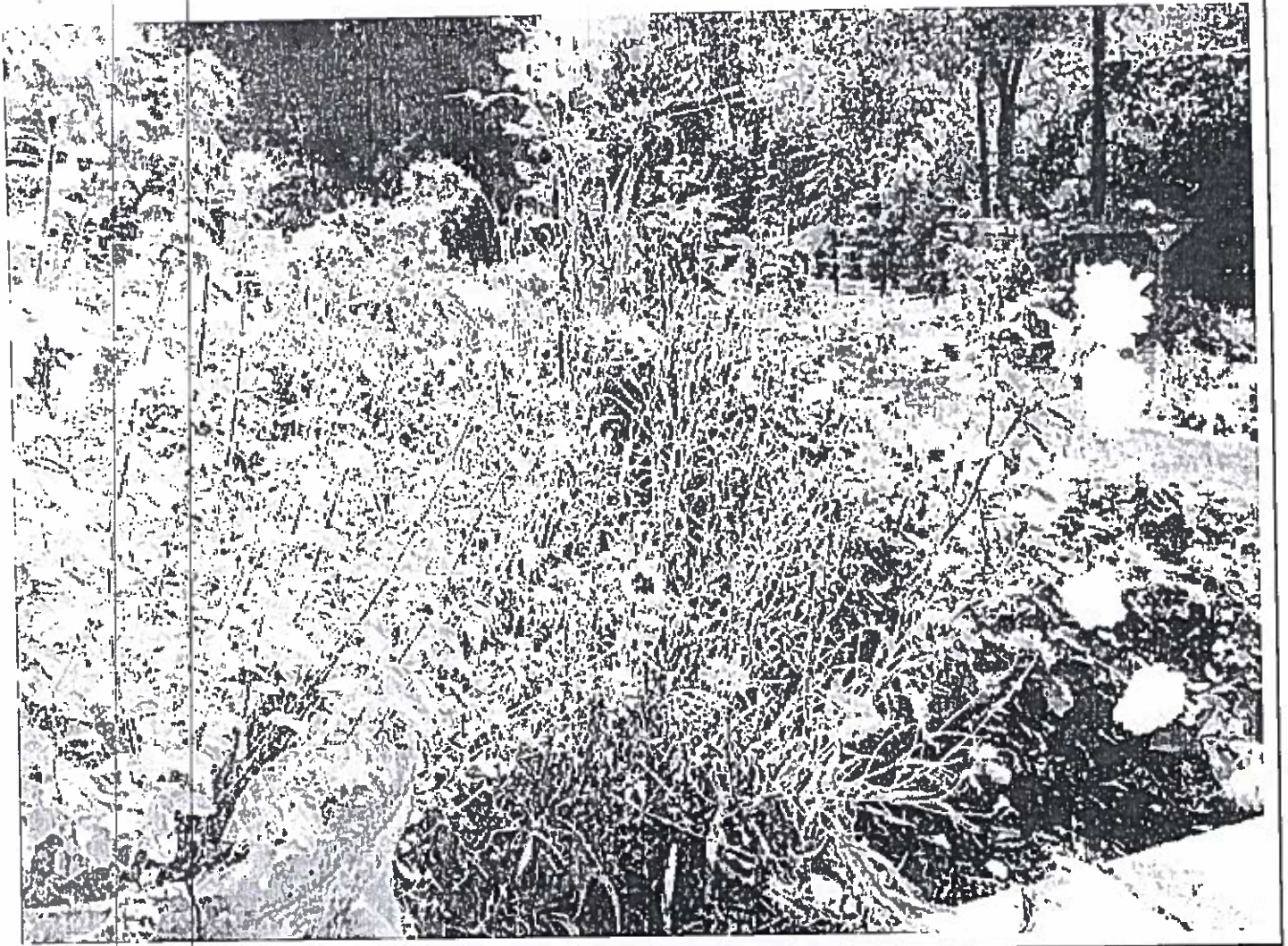
What Jessica advocates is the establishment of "insectary gardens" to attract beneficial insects (good bugs), such as syrphid flies, lady beetles, minute pirate bugs, lace wings and predatory wasps that attack "bad bugs" such as spider mites, thrips and aphids. As long as you don't spray things that kill them, these predators are very easy to attract to the garden with plantings, such as oregano, dill, bachelor buttons, lobelia, yarrow, daisies, alyssum and cosmos (and many others cited in the book).

The Two-Step Process for Pesticide-free Roses

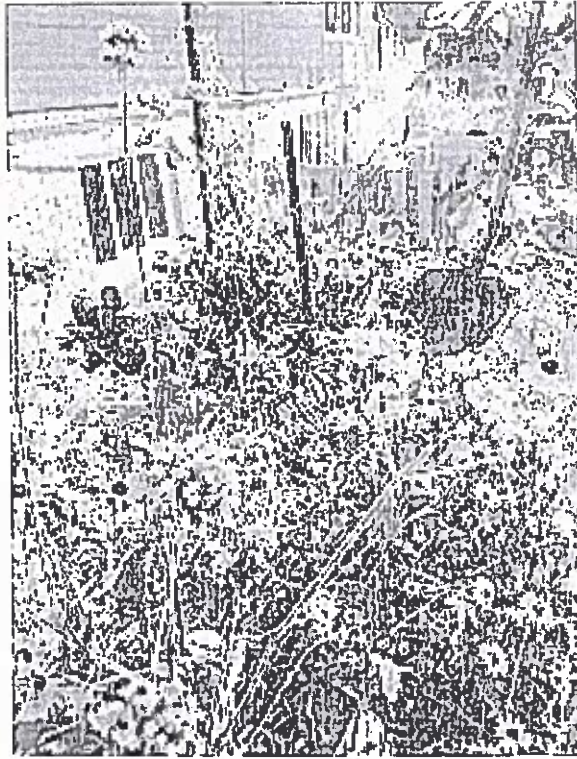
Please note that these steps should be accomplished almost simultaneously, with predatory mites being introduced in warm weather, right after insectary gardens have been planted.

Insectaries

To get started, I found several areas in my yard that could be converted to insectaries. My first was a sizable spot where we had previously grown raspberries; my second was a new garden that I planted for the first time in 2015. Then, I opened up small areas in each of my rose gardens for insectary plantings. In one case, I removed several roses and replaced them with insectary plants. Here's how that little garden segment looked in 2014, with oregano, bachelor buttons, cosmos, dill, yarrow and a few other things to attract beneficials (Buck's Prairie Harvest is to the right). When I took this picture, the insectary was teeming with wasps, bees and other beneficial insects that were nowhere to be found in my gardens the previous year:



Below is the insectary garden that replaced my raspberry patch. Note the mating Monarchs on the lobelia; a great example of what happens in an insectary garden.

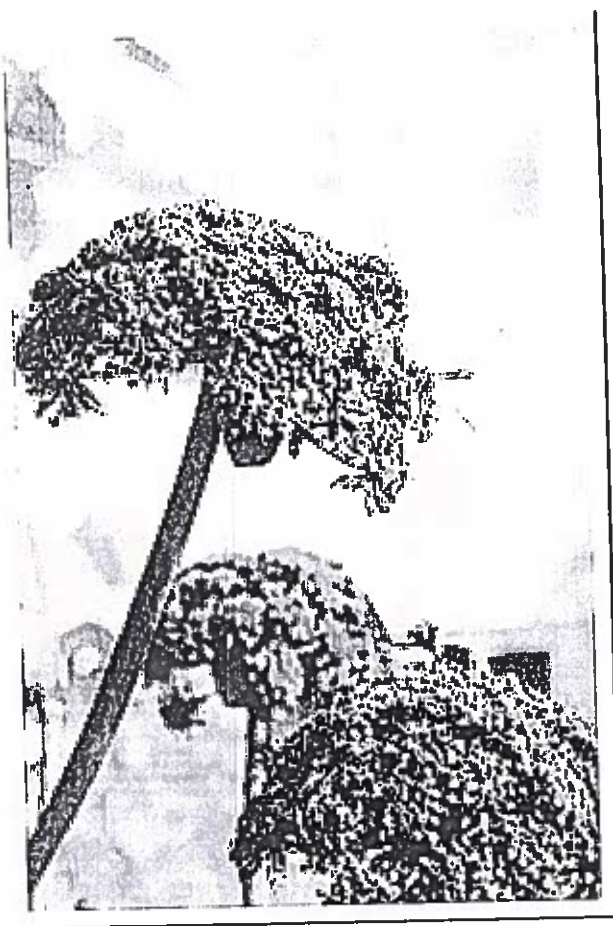


Below is my new insectary bed, which was planted in 2015; complete with an Eastern Black Swallowtail.



And Here is a picture of an Angelica plant in action in the "raspberry" insectary, in 2015. This one attracts large numbers of parasitic wasps, minute pirate bugs, lady beetles, syrphid flies and tachinid flies; all very important beneficials in the fight against spider mites, thrips, aphids

etc. Note that there were at least three wasp varieties on the plant when this picture was taken.



I should also note that, because oregano attracts so many beneficial insects, I have planted a little patch of it, right in the middle of each of my rose gardens. Of course it spreads quickly, so I have to chop it back and transplant pieces elsewhere in the garden, each spring. When it blooms, it is literally covered with beneficials, which, of course find their way onto every rose plant and bloom.

And here is the old Minnesota Rose Gardener showing off one of my insectaries, with zinnias, lobelia and cleome. I find that I am never happier than when I am in the garden, among the bees, wasps, butterflies, and other pollinators and beneficials.



One of the most important things Jessica Walliser talks about in her book is the importance of patience. When there is an infestation of insects like aphids, thrips or spider mites, it takes time to build up enough predatory mites and beneficial insects to feed on them. In the meantime, while being patient, use the first line of defense for aphids and spider mites, which is washing the bugs off with water. I have learned that spider mites succumb to a fine mist of water, thereby not washing off beneficial mites with a sharp stream of water. Thrips are harder to deal with, so the first line of defense is always to pick and dispose of affected blooms in such a way (as in a covered can) that the thrips can't fly back into the garden. Here is the kind of thrips-infected bloom that should always be immediately removed.



For Japanese Beetles, pick or shake them off into a can of soapy water (more on this later). But by no means should you give in to the temptation to spray an insecticide, because that will ruin the entire process underway in your garden. In short, just remember that **predatory mites and insectaries really work, if you give them a little time!** And **Japanese Beetles must be handled seperately.**

Predatory Mites

The several varieties of these tiny arachnids are very efficient predators for pests such as two-spotted spider mites, eriophyid mites and thrips.

Stratiolaelaps (Ss) should be the first mite to be introduced in rose gardens. It is a generalist soil predator that feeds on pupating thrips and overwintering spider mites. It is also known to feed on pupating rose midge, but it has not yet been proven as a control, and several midge trials are underway. It has been very effective on thrips in my gardens, in just one year, and it is

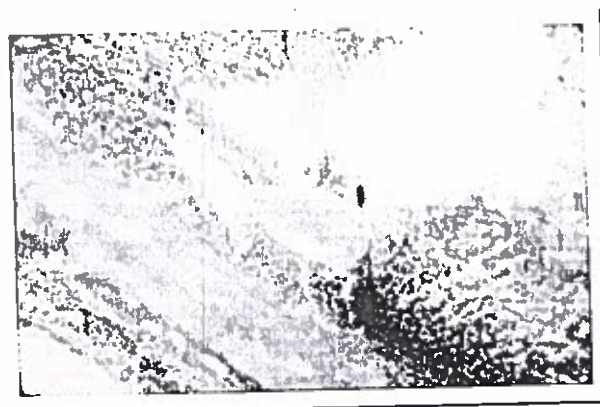
known to overwinter in both Canada and the United States. Here is a good description and video from Applied Bio-nomics, in Victoria, British Columbia:
<http://www.appliedbio-nomics.com/products/stratiolaelaps/>

And here's what Ss looks like in the soil:



Cucumeris feed on thrips larvae. They sense thrips emerging from leaf tissue and wait to bite the heads off the emerging thrips. However, Cucumeris is a true generalist, capable of providing preventive control against the Two-spotted Spider Mite, and also an effective Biocontrol for Broad and Straw Mites. It also eats whitefly eggs. It does not overwinter in northern climates and must be re-introduced each year. Here is Applied Bio-nomics' description and video:
<http://www.appliedbio-nomics.com/products/cucumeris/>

And here is a really good picture of Cucumeris feeding on Thrips:



Fallacis is the most effective preventer of spider mites available. Applied Bio-nomics hasn't found a mite that Fallacis won't control. This is very important because, in my garden I found (with the help of Applied Bio-nomics) that I was fighting both Two-spotted Spider Mites, plus some type of Eriophyid mite; most likely the "Broad" mite. Some Eriophyid mites carry Rose Rosette disease (fortunately not the one I've been fighting) and this makes the presence of Fallacis all the more significant in rose gardens. Fallacis overwinters everywhere in the continental United States and as far north as northern Quebec in Canada. Here is Applied Bio-nomics' video description of Fallacis:

<http://www.appliedbio-nomics.com/products/fallacis/>

And here is a picture of Fallacis at work feeding on a Citrus Red Mite:



Here is a picture of Earth Song in my garden, showing damage by Eriophyid mites, which I mistook for Spider Mite damage. Fortunately, Fallacis had a big impact on this mite in my gardens last summer.



Persimilis targets Two-spotted Spider Mites and is one of the oldest and best beneficials in use. It is capable of complete eradication of its prey. Like Cucumeris, it does not overwinter but, in all likelihood, if you use it in combination with Fallacis, you will not need to reapply it the following year, since spider mites should be under continuing control with overwintering Fallacis. Here is Applied Bio-nomics description and video:

<http://www.appliedbio-nomics.com/products/persimilis-max/>

And here is a picture of Persimilis at work:



Summarizing, Stratiolaelaps (Ss) is basic to controlling thrips and spider mites and should be introduced first, in the spring warmup. It should only have to be introduced once, as it should stay in the soil for many years. Next, if Spider or Eriophyid mites are present, Fallacis should be

introduced, to overwinter in the garden with Ss. If Thrips are present, Cucumeris should be introduced in warm weather, as both a Thrips and Spider Mite control. Finally, if Spider Mites have been a recurring problem, as they were for me, Persimilis can be added. Remember that neither Cucumeris or Persimilis overwinter, so, if needed, they must be introduced again the following growing season. In my own case, Thrips were a persistent problem until late in 2015. In the event I see them again in 2016, I will immediately introduce Cucumeris for another growing season.

Sourcing Predatory Mites

The distributor for Applied Bio-nomics mites, that I have used, is Rincon-Vitova Insectaries in Southern California. <http://www.rinconvitova.com/>

Rincon's pricing on Applied Bio-nomics' products is quite reasonable; however, product pricing is overshadowed by the cost of necessary overnight shipping. This can be mitigated by combining orders, as much as possible. For example, if you are ordering product in late spring or early summer, Srtiolaelaps, Fallacis and Cucumeris can be ordered at the same time to save on shipping. This should be discussed specifically with Rincon.

I have always taken into consideration the high cost of miticides and insecticides and recognized that I am ultimately eliminating them with predatory mites and beneficial insects.

Based on my experience of the last two years, I believe it's well worth the up-front cost of predatory mites and any other beneficial insects you might choose to import.

My primary contacts at Rincon-Vitova have been Gabriel or Kyra at 800 248-2847. They will be expecting calls from rosarians.

Here is a list of Applied Bio-nomics distributors, worldwide:
<http://www.appliedbio-nomics.com/distributor-map/> .

Japanese Beetles

I believe the most viable way of dealing with Japanese Beetles (JBs) is knocking them off the plants into soapy water, i.e. without insecticides. Unless you are running a very large public or commercial garden and have no other alternative, the repeated use of insecticides on JBs is just too devastating to everything else in the garden. Here is an excerpt from the 2015 revision of my JB blog post:

After several years of experimenting with insecticide control of JBs, I am firmly convinced that it is the wrong approach in the home or small public garden for the simple reason that it massacres all other beetles in the garden, most notably the lady beetle, which is perhaps the most important beneficial bug for controlling a variety of insect garden pests. Also, all of these insecticides harm pollinators, especially bees, as well as virtually all other beneficials such as wasps, syrphid flies, lacewings, minute pirate bugs etc., as well as predatory mites, which attack a large variety of pests such as aphids, thrips and two-spotted spider mites. Once