ROSE PESTICIDE SPRAY PROTOCOL

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The following are the pesticide products used in our rose garden. The listed products below provide the product name or the active ingredient (propiconazole as an example) as there are many interchangeable named products which contain the same percentage of active ingredients. The labeled dilution rate at which the pesticide is used is provided with the following warning. Some of the products provide dilution rates in ounces per 100 gallons of water, for these pesticides they have been reduced to the closest standard measuring spoon quantity, some also provide a range of dilution rates and the lower dilution rate is provided, and lastly I cannot over stress this point, regardless of the dilution rate provided below it is imperative you read the label and determine the dilution rate on the label as they may and can change in addition to reading the entire label from beginning to end as it reports on re-entry interval after application, order of mixing, personal protection equipment, clean up and more. The list also provides the FRAC (Fungicide Resistance Action Committee) and IRAC (Insecticide Resistance Action Committee) group number which is the mode of action in which each pesticide works. The purpose of the codes are to limit the resistance of insects and fungi by rotating between modes of action.

<table>
<tr><th colspan="2">Fungicides</th></tr>
<tr><td>Contact</td><td>Systemic</td></tr>
<tr><td rowspan="3">Manzate Pro-Stick Turf and Ornamental
1-1/2 tsp/gal
Group M 03</td><td>3336F
1 tsp/ gal
Group 1</td></tr>
<tr><td>Propiconazole
½ tsp/ gal
Group 3</td></tr>
<tr><td>Postiva
¾ tsp/gal
Group 3 & 7</td></tr>
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In the fungicide list above every spray application uses the same contact fungicide in the tank mix because Group M 03, in this case Manzate, has no known resistance while the

systemic listed fungicides do develop resistance. The systemic fungicides are used in rotation, as an example application 1 will include 3336F in the tank mix, application 2 will include propiconazole, and application 3 will Include Postiva in the same spray tank mix each time with the contact fungicide Manzate Pro-Stick Turf and Ornamental.

Chili Thrips

Insecticide	
Abamectin ½ tsp/gal **Group 6**	Conserve ½ tsp/gal **Group 5**

As noted under the fungicides above the two insecticides listed are used in rotation, Abamectin in spray application 1 and Conserve in spray application 2, then return to 1. The Abamectin is also beneficial in the rotation as it was originally utilized as a miticide for spider mite infestations and is labeled as a miticide/insecticide although at a higher labeled dilution rate than a ¼ teaspoon/ gallon for spider mites. The benefit of using Abamectin in rotation for Chili Thrips is that it seems to prevent spider mite outbreaks or diminishes their severity.

A further note about including insecticide in every spray application. Prior to 2004 the inclusion of insecticides in a spray mixture occurred only when there was an insect infestation as there are always insects present, both beneficial and detrimental. Starting after the hurricanes of 2004 when Chili Thrips became prevalent, and their infestations decimated roses resulting in reported loss of plants, hence it became necessary to use insecticides targeted toward Chili Thrips to prevent infestations. Treatments to eradicate severe infestations involves a very intense protocol requiring multiple insecticides used in succession over a very short period of time to salvage plants and gain control over Chili Thrips. In addition to the two products listed above, Spectracide Triazicide Insect Killer is broadcast spread across the entire rose bed on 3-month intervals. Triazicide has been found beneficial, as one of the Chili Thrips pupae stages occurs when some of them drop to the ground where they reside in the soil before emerging. Triazicide will control this pupae stage of the Chili Thrips.

Adjuvant

Brandt **Indicate 5** is used in every spray tank mix. This adjuvant provides pH buffering extending the half-life of the pesticides. It utilizes a color changing method when added to the water to indicate the desired optimal pH range of 4.5- 5.5. Additionally Indicate 5 is a surfactant, reduces surface tension, which provides an even film over the leaf surface when the applied pesticides are sprayed. In our water we utilize 1 teaspoon/gallon although the existing pH of water is not consistent across all Florida it is necessary to determine the quantity of Indicate 5 required to achieve the optimal pH range which is performed by measuring out one gallon of water from the source used for your spray mixtures and slowing

adding Indicated 5 in ¼ teaspoon intervals until the color corresponding to the optimal range is achieved. Once this is done this is the last time one should have to perform this analysis.

Spray Interval

Historically over the course of 30 years the interval at which the roses were sprayed for fungal diseases was every 7 days. In the last 10 years the interval has changed, and during one period which it was determined never to be repeated again, the interval was anything but consistent and could be a duration of a month or more. Fungal sprays are for prevention and the interval needs to be based on preventing fungus diseases in the garden as they will spread quickly, and when they become severe the required effort to gain control to suppress the outbreak and then prevent further infection is worse than a routine spray program. For the last several years the interval has generally been every 2 weeks, with the interval stretching to 3 weeks, which is dictated by weather conditions, both during the 2 week interval and the forecast for the following week. Fortunately, this interval has been very successful in our garden. However, there is a caveat to this interval.

The caveat is that it would not be recommended if there is already fungal infection in the garden. The recommended time to start this interval is right after the major winter pruning as we practice stripping all the foliage from the plants, hence any fungal spores on leaves are removed from the garden then the defoliated pruned roses are sprayed utilizing the fungicides listed above and continued every 2 weeks. Following the weather as an indicator, but usually from pruning through May, the roses are on a strict 2 week spray interval. It is in May, that depending on precipitation and other climatic conditions, that the interval may be stretched to 3 weeks. Over the last several years this interval has been practiced and the success has been as good as when the garden was sprayed every 7 days.

BLACK SPOT PREVENTION/TREATMENT PROTOCOL FOR THE SMALL ROSE COLLECTIONS

EXECUTIVE SUMMARY

Fungicides:

Contact: Pick one of the contact fungicides below and use in every spray application.

Bonide Mancozeb Flowable w/zinc

Southern Ag Dithane M45

Systemic: Pick two (2) with different FRAC Group number below and rotate the FRAC Group Codes. Example 1st application FRAC Group 1, 2nd application FRAC Group 3, 3rd application FRAC Group 1.

Bonide Infuse (FRAC Group 3)

Southern Ag Thiomyl (FRAC Group 1)

Alternative to Bonide Infuse, BioAdvanced 3-in-1 Insect Disease & Plant Mite Control (fungicide, FRAC Group 3)

The table below provides the equivalent fungicide, same active ingredient, as the fungicides utilized in our rose garden.

Contact Fungicide		Systemic Fungicide	
My Garden	Small Garden Equivalent	My Garden	Small Garden Equivalent
Manzate Pro-Stick Turf and Ornamental	Mancozeb	3336F	Southern Ag Thiomyl
	Dithane M45	Propiconazole	Bonide Infuse
		Postiva	No equivalent

Insecticide for Mites

Water wand/ mite blaster or refer to the Spider Mite article under the Files tab in this Facebook Group.

A local rose grower recently visited our garden, bringing with them leaf samples from their rose bushes. They asked if we could identify the problem and how to treat it. The leaves exhibited symptoms of Black Spot in addition to Chilli Thrips damage. Many of you in this group probably are experiencing black spot or will be experiencing black spot. You may not have encountered it this spring due to the recent lack of rain. We can expect the rain to return … resulting in ideal conditions for back spot spore germination.

In lieu of answering our guest's question individually this response is posted on the Group's page as it may answer questions many of you have regarding controlling black Spot … But haven't asked. Warning, in the event you are averse to applying pesticides for black spot on your roses the remainder of this post is not relevant as non-pesticide treatment and prevention is not addressed. This endeavor started with researching the pesticides available in big box stores, Home Depot and Lowe's, for the small rose collections.

For the rosarians in this group with smaller collections of roses, the pesticides used in our rose garden come in quantities that cannot be consumed within a two-year window, the approximate shelf life once the pesticide is opened and stored. Thus, I am recommending products which are available in sizes tailored to those growing fewer bushes.

When researching the big box stores I discovered the pesticides available were very limited. Several large local garden center website investigations resulted in little success. Hence, a search for on-line sources was conducted as products are readily available to everyone and are shipped directly to your home. Amazon was the first on-line source for researching the available fungicides conforming to the recommended standard black spot fungicide protocol. We will not address the details of how our black spot protocol was developed and practiced. Suffice to say the protocol has had great efficacy in our garden for over 40 years.

An alternative on-line source is 'DoMyOwn' (domyown.com) pest control. The vast majority of pesticides we purchase are from DoMyOwn. If you are not familiar with this company, DoMyOwn has excellent customer service, free shipping with delivery generally under 5 days, and pricing lower than Amazon, garden centers, big box stores and agricultural supply warehouses. And now the "Disclaimer": References to products or companies provided are not an endorsement, compensation is not received for products or sources for products referenced, some products have not been used in our garden, and the recommendations and or comments are generated from a review of the manufactures label and cross referencing the active ingredient(s) to the identical active ingredient(s), as well as research publications in formulating the expressed opinions. Part of the research in providing these recommendations included a review of the active ingredient(s) from different manufactures' labels and determining the IRAC (Insecticide Resistance Action Committee) and FRAC (Fungicide Resistance Action Committee) codes which identifies the mode of action for insecticides and fungicides.

For brevity purposes the intent is to provide the rationale for the pesticides listed based on their mode of action so we use complementary fungicides and insecticides. Some of the pesticides in IRAC and FRAC do not develop resistance, i.e., immunity from the active ingredient, while others may develop resistance. As a result of resistance management pesticides are recommended in rotation, alternating between spray applications differing mode of action, to prevent the targeted pest from developing resistance to the active ingredient which renders them useless in combating the target.

For Black Spot, as a preventative and to combat the existing fungus, two types of fungicides are utilized: a systemic fungicide (absorbed into the plant) and a contact fungicide (which do not enter the plant's tissues, but rather act on the black spot

fungus on the surface of the leaves). The contact fungicide is one of the fungicides that does not develop resistance therefore it is used in every spray mix. The contact fungicide is Bonide Mancozeb Flowable w/zinc, and an alternative is Southern Ag Dithane M45. Both contain the same active ingredient, Mancozeb (FRAC code M03).

Addressing the systemic fungicides for Black Spot, which is absorbed internally into the plant, the two products recommended have the same active ingredient as the fungicides used in the protocol in our garden. The only difference from the specific brand name used in our garden and the recommended products is the percentage of active ingredient. Those used in our garden have a higher percentage of the active ingredient resulting in a higher concentration which require less of the pesticide diluted in a gallon of water. The two systemic fungicides are Bonide Infuse, active ingredient propiconazole (FRAC Group 3) and Southern Ag Thiomyl, active ingredient Thiophanate-Methyl (FRAC Group 1). Alternatively, BioAdvanced 3-in- 1 Insect Disease & Plant Mite Control (BioAdvanced), active ingredients imidacloprid (insecticide, IRAC Group 4A), Tau-fluvalinate (insecticide, IRAC Group 3A) and tebuconazole (fungicide, FRAC Group 3) can be used in place of the Bonide Infuse if one feels so inclined since it is in the same FRAC Group 3. The systemic fungicides are rotated, as an example Bonide Infuse is mixed in spay application 1, 3, 5 etc. and Southern Ag Thiomyl is mixed in spray application 2,4,6 etc. with the Mancozeb/Dithane M45 included in every spray application. As you can see the two systemic fungicides have two different modes of action which reduces the probability of developing black spot resistance to our systemic fungicides.

The one advantage of the BioAdvanced is that it includes an insecticide, imidacloprid and tau-fluvalinate with the label stating it as effective on Thrips and Spider Mites. A review of the tau-fluvalinate (Mavrik Aquaflow) indicates a range of dilution rates for spider mite and thrips while BioAdvanced only provides one dilution rate. The BioAdvanced eliminates the requirement for another pesticide, insecticide for thrips and mites although a potential for resistance to the fungicide may develop since it would be used without rotation as well as for the insecticide used without rotation. Spider mites are not specifically addressed here, as an article on Spider Mites is provided in the File tab on the Facebook Group page as the best solution for the smaller collections is the mite blaster.

I have not addressed Chilli Thrips specifically. It is not feasible to attest to the efficacy of imidacloprid based on personal use for on Chilli Thrips. In researching Chilli Thrips, the University of Florida institute of Food and Agricultural Science has conducted research on various insecticides for the efficacy on Chilli Thrips and

it indicates imidacloprid as effective. “Various formulations of imidacloprid used as either soil drench or foliar application provide effective control of *Scirtothrips dorsalis* without harming natural control agents. Imidacloprid suppresses *Scirtothrips dorsalis* populations for many days (Seal et al. 2009b). Spinetoram gives the best result when used as a foliar application and imidacloprid as soil drench (Seal et al. 2008). In addition, these two insecticides when applied as above allow the continuous growth and development of natural enemies of *S. dorsalis”**[i]***. The BioAdvanced may be incorporated as an alternative

since its active ingredient is imidacloprid. Although it is recommended an additional insecticide with a different mode of action be added for Chilli Thrips to be used in rotation. Spinosad (IRAC Group 5), has high efficacy in combating Chilli Thrips and a number of products are available on Amazon which contain spinosad. Assuming the imidacloprid and spinosad are purchased, the imidacloprid would be added to the spray mix with fungicides on spray application 1. 3, 5 etc., and spinosad will be added to the spray mix with fungicides on spray applications 2, 4, 6 etc.

My recommendation for the pesticides to use, which correlates to the same active ingredients I have used for years with great success, are as follows:

Systemic fungicides: Bonide Infuse and Southern Ag Thiomyl

Contact fungicide: Mancozeb or Dithane M45

Insecticide for Chilli Thrips: Spinosad and Imidacloprid

Spider Mites: Water wand/ mite blaster or refer to the Spider Mite article under the Files tab in this Facebook Group.

THE FINAL NOTES: *In this Group's page under the Files tab resides a document titled "The Fundamentals of Growing Roses" and lists pesticides for the rose garden. The pesticides recommended above resulted from a recent on-line search whereas The Fundamentals of Growing Roses is somewhat outdated and the products have changed names or are no longer available.*

Should you elect to purchase the pesticides referenced, or for that matter any pesticide, always read the entire label, not only the dilution chart. Write the date on when the pesticide was opened on the label and note the dilution rate as well. You may find that some of the labels will provide a dilution rate per 100 gallons. If you do I find it best to convert the ounce into teaspoons and divide that by 100 which will provide the dilution for 1 gallon of spray.

*Additionally, the label provides other important information such as the order in which pesticides are added to the spray mix, personal protection equipment, re-entry time for pets and humans after product is applied, as well as toxicity to humans and other living creatures***.**

[i]Vivek Kumar, Dakshina R. Seal and Garima Kakkar, 2009 Chilli Thrips Scirtothrips Dorsalis Hood (Insecta: Thysanoptera: Thripisae) (IFAS Publication Number EENY-463). Gainesville: University of Florida institute of Food and Agricultural Science. Retrieved June 9, 2024 from hhtp://edis.ifas.ufl.edu/publication/IN833