

Poor David's Almanac by Dave Ingram, Master Rosarian

A Revised White Paper on Black Spot Part 3 - "Poor David Brays About Sprays"

While it is true that most bacteria and fungi in our gardens are part of the beneficial Soil Food Web, there comes a time in every gardener's life when Bad Fungus breaks loose and threatens to overwhelm our plants. The chemical tools to fight back are many, but so are the risks. Pouring liquid chemical fungicides at the base of the plant can harm beneficial fungi that live in the soil, and experience has shown Poor David that not enough product is taken up by the roots to consistently protect rose leaves. Nationwide, many rosarians employ a relentless spray program, rotating through several chemical products to prevent the target fungus from developing resistance to any one product. So much work! But in my Arvada garden, I find that good cultural practices, along with a handy quart spray bottle, are usually all I need to manage black spot. Only in rare cases of Garden Health Emergency do I need to break out my trusty 2-gallon sprayer.

Chemical Controls: Since Bordeaux Mixture first showed up in the 1880's (copper sulfate and lime - still in use today), the standard approach to using fungicides for black spot control has been preventative: coating the leaves and stems to prevent an infection from beginning. That still holds true today. There are far too many preventative products in the current marketplace for us to cover here, but be aware: many are very toxic with serious label commands like Warning and Danger.

Which brings us to **A Main Point:** Any time a gardener uses a spray material, it is very important to carefully read the entire label and follow all directions listed. There is little research on the effects for humans of long-term exposure to any of the more toxic chemical spray substances. Be aware of the toxic level of the product you choose before you take it home. A pretty spray bottle on a shelf may still contain a very toxic substance. Read "To Spray Or Not To Spray," in "Growing Roses In Colorado" for more guidance.

Tip: Re-read the label each year as if for the first time. Never assume you know what to do. Follow all the directions. If the label says to use safety goggles or a respirator, do so. Remember that human skin acts like a sponge for toxic substances. Once absorbed, these substances don't come back out. Always play it safe.



2-Gallon sprayer
© Dave Ingram

Sprayers for fungicides come in an endless variety of forms. I like to use a hand-squeezed quart sprayer, and keep a 2-gallon hand pump sprayer in reserve. It is probably smart to wear chemically resistant nitrile gloves (easily found at medical supply stores and Harbor Freight Tools), even when handling innocuous products like liquid fertilizers or insecticidal soaps. Carefully clean your sprayers after each use.



Quart spray bottle ©
Dave Ingram

5 Tips for Success: I like to spray in the morning, when 1) there is no breeze to blow the spray around, 2) no neighbors who might be exposed, & 3) the morning sun can dry the spray promptly with less risk of leaf burning. Also: 4) Avoid spraying when the temperature is over 85 degrees to reduce leaf scorch. 5) Unless labels specify otherwise, it is best for most sprays to be re-applied after rain.

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Many chemical fungicides carry a garden re-entry limitation, which might be 24 hours or more. Be aware if your product requires this.

Let's begin with an I.P.M. approach to chemicals, and focus on a few less toxic preventive spray possibilities. For us spraying is a choice, rarely a necessity. If you can identify certain months or weather conditions that may warrant preventative spraying, the options listed below are a good place to start. There are also at least two fungicides that claim to be able to kill black spot conidia spores and halt an infection. With these two, you may have to spray multiple times to control the infection (think twice a week for up to three weeks, unless product labels indicate otherwise). Because black spot *acervuli* open and release spores over time, a single spray may not be able to access all the spores.

Tip: Rugosa roses, because of their unusual leaves, do not tolerate sprays well. You may seriously burn the leaves, or badly injure the plant by spraying it.

Preventative:

1. **Neem oil.** Mixed with water, neem has emerged in recent years as a favorite spray material. It does appear to have some preventative effect on black spot. Be aware that most hydrophobic neem oil formulations (although usually stripped of Azadirachtin, the main insecticidal ingredient) still have some insecticidal properties, and could affect the predator/prey balance in your garden.
2. **Sulfur.** A very old remedy, and a favorite of many gardening websites. When mixed with a surfactant (like a soap) and water, sulfur does have some preventative effect. But it must be re-applied frequently, and can only prevent, not cure, black spot.
3. **Sodium bicarbonate (baking soda).** These days it seems like every publication and website has its own baking soda fungicide formula. Most of the published tests of these formulas that I could locate were for powdery mildew, not black spot, and were performed on edible crops, not roses. The Cornell formula developed in the 1980's by Dr. Kenneth Horst, which was tested on roses, is now in limbo since a main component of that formula, Sunspray Horticultural Oil, has been withdrawn from the market. And Dr. Horst himself abandoned research on sodium bicarbonate in favor of potassium bicarbonate (see below). So the use of baking soda as a treatment for black spot should be done on a preventative basis only, and at your own risk.

Prevent and Kill the Spores:

4. **Potassium Bicarbonate.** In the 1990's, Dr. Horst moved his research focus onto this different bicarbonate, which he felt produced better results for both black spot and powdery mildew. He eventually developed and marketed GreenCure®, a potassium bicarbonate formula. GreenCure is a ready-to-mix powder that is sprayed on roses as a contact fungicide. At a lower mixture rate, GreenCure can be used to prevent black spot. At a stronger mixture rate, GreenCure claims to be able to kill the spores to prevent the spread of the disease. Keep in mind that nothing can restore the dead leaf tissue that forms the black spot, so even treated leaves will have to be removed to prevent confusion with a new infection.

GreenCure's toxicity is low. Listed for organic production by OMRI, vegetables can be harvested an hour after spraying. So GreenCure (available from the Denver Rose Society, internet suppliers, and a few better local nurseries) is a useful, green fungicide for preventing, and even halting the spread of black spot in our area. I find it



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GreenCure® Potassium Bicarbonate Fungicide GreenCure.net

5. **Mancozeb.** This is a dithiocarbamate, multisite fungicide that has long been used to prevent black spot from getting started. But Rosemania.com states that one version of their product, Pentathalon DF, is a "contact killer" for black spot spores. Again, killing the spores will stop the spread of a current black spot infection, but not heal the damage already done. Although labeled Caution, mancozeb is a cholinesterase inhibitor and therefore can affect the nervous system. Depending on label instructions, there may be garden re-entry restrictions when using mancozeb. Always follow product label instructions exactly. Mancozeb is a key ingredient in a wide variety of products, but may be tricky to find in economical packages. Colorado prohibits sales of several online products.

As mentioned above, most other chemical fungicides available to the home gardener, such as Funginex, Cleary's, Banner Maxx, or Compass (all with varying degrees of toxicity), can only be used to prevent blackspot. They may not be necessary in our area.

Summing Up: Black spot is a fungus that needs water contact within a fairly broad temperature range to germinate spores and infect roses. Good cultural controls, coupled with our naturally dry climate, can keep black spot at bay along the Front Range. And in those years when an outbreak gets started, products such as GreenCure and mancozeb can help bring black spot under control, then be used to prevent it coming back. Although black spot is a serious fungal scourge in many parts of our country, in our area a little knowledge, coupled with diligence, can keep this nasty little fungus from spoiling your summer rose gardening party.

Acknowledgment to the Compendium of Rose Diseases; articles by Ethel Dutky, Joan Franson and Don Julian; and websites such as HPIPM, GreenCure, Rosemania, and more than two dozen others.



Sprayed infected leaves should be removed

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