

Downy Mildew

By: Jeff Wyckoff

In my part of the Pacific Northwest, rose growers have a relatively benign group of insect pests to deal with (compared to our Japanese beetle-infested eastern brethren) and so focus most of our pesticidal attention on the "big three" fungal diseases -- blackspot, powdery mildew and rust -- that seem to bedevil us on a yearly basis. However, every few years, we are confronted with a far more virulent fungicidal invader known as *downy mildew*.

Downy mildew is a fairly common term as far as plant diseases go; a Google search will turn up downy mildew on all manner of food and ornamental crops. However, each of these is caused by a different pathogenic agent that is specific to only one type of plant. For example, downy mildew on grapes is caused by *plasmopara viticola*, on cole (cabbage) crops by *peronospora parasitica*, and on onion and garlic by the ominously-named *peronospora destructor*. There was even a short-lived pop band named Downy Mildew, but it is unclear what plant it attacked. In any case, downy mildew on roses is caused by the fungal agent *peronospora sparsa*, the name "sparsa" because spore production is sparse under less-than-ideal conditions. Downy mildew appears on our garden roses only when these ideal, or at least very favorable, conditions are present.

They are:

- Humidity over 85%
- Temperatures under 80°

Kenneth Horst, in his *Compendium of Rose Diseases*, states that the optimum temperature for spore germination is c. 66°, and that germination in water can take as little as 4 hours and symptoms can appear on leaf surfaces within 3 days of germination. Spores may survive and be viable on fallen leaves for as long as a month, but temperatures of over 80° for a 24-hour period will kill all active spores.

While these conditions are frequently present in northwest gardens during the months of April through June, they usually result only in mild and sporadic outbreaks of downy mildew. It seems that the sparsa spores are not necessarily constantly lurking in our gardens, just waiting for ideal temperature and humidity conditions to strike.

The real problem comes when these conditions are also present in the California growing fields where the great majority of our rose plants come from. Every few years fall storms in Southern California and Central California create ideal conditions for downy mildew outbreaks prior to the harvest and storage of the rose plants. Disease spores can then be shipped with the plants, and when those ideal conditions are replicated here, the disease shows up in our nurseries and gardens, wherever the infected plants are sold or planted. Certainly the California growers take all the precautions they can to prevent such a problem; for example, most of the plants are dipped in a fungicidal bath before being shipped. Nonetheless, it behooves us a rose growers to take all steps necessary to detect and treat downy mildew should it appear, from whatever source.

Downy mildew is a major threat to our rose gardens for at least four reasons, other than that of its rapid germination:

- Once it takes hold, it will defoliate a plant very rapidly, much more quickly than will blackspot. While total defoliation does not immediately kill a plant as would, say, an accidental application of an herbicide, its loss of photosynthesizing ability stresses and weakens the plant to a degree that it becomes totally unproductive, a situation from which it may never recover.
- Downy is extremely contagious and will spread throughout your rose garden very quickly if left untreated, laying waste to all the plants within a very short time.
- The symptoms of downy mildew are frequently confused with those of blackspot, resulting in the disease being misdiagnosed and consequently mistreated.
- The chemicals that are readily available and that we normally spray to control blackspot, such as Daconil and Triforene (Funginex), have little/no effect on downy mildew.

The first line of defense against downy mildew, then, would be an awareness of its existence and an understanding of the conditions in which it flourishes. The second would be a recognition of the symptoms of downy, and an eye to distinguishing these from those of blackspot, and also of spray burn.

A comparison of the two would look thus:

Downy Mildew	Blackspot
1. Leaves have reddish-black spots that are “angular” – having a flat side. When a spot comes to a leaf vein, it follows it.	1. Leaves have black and yellow “rounded” spots. When a spot comes to a leaf vein, it crosses it.
2. Plants are rapidly defoliated, usually from the top down.	2. Plants are slowly defoliated from the bottom up.
3. Appearance of symptoms despite early and regular use of a blackspot-effective fungicide.	3. Early and regular fungicidal use results in an absence of symptoms.
4. Appears during periods of moderate temperatures and high humidity.	4. Appears anytime.

So, having discovered what you believe to be downy mildew on your roses, how do you go about treating it? A precautionary first step would be to have your diagnosis confirmed by a Consulting Rosarian who is familiar with the disease; there is no sense going to extraordinary measures to combat something that isn't there. The next step would be to remove all infected foliage from the plants and from the garden to minimize the spread of the disease.

Finally, which fungicides will work against downy mildew? According to research, as well as empirical evidence, dithiocarbamates such as **Dithane T/O** and **Protect T/O** (turf & ornamental) can work, but must be applied to the undersides as well as the tops of the leaves. However, the three best seem to be **Aliette** (fosetyl aluminun), **Subdue 2E** or **Subdue Maxx** (copper metalaxyl), and **Stature DM** (dimethomorph). Of these, Aliette seems to be the treatment of choice. It is available from **Rosemania** (888-600-9665 or www.rosemania.com) at 5.5 lbs for \$145 or 4 oz. for \$29. Stature DM is also available from Rosemania at \$159/lb. Subdue Maxx and Dithane T/O are both available from the **Wilbur-Ellis Co., 1519 14 th St. SW, Auburn, WA** (253-351-6591). Dilution rates and frequency of treatment for each of these products will be stated on the label.

Once you have treated your plants (or the temperature goes up and the humidity down) and the disease is under control) you should severely prune back those bushes that were heavily infected and defoliated, and allow them to essentially "start over" with all the TLC you can lavish on them. Even then, their performance (or lack thereof) may indicate that they should be replaced.

The bottom line, then, in the fight against downy mildew is to **be educated, be vigilant, and "bekeeping"** ... the names and addresses of pesticide suppliers handy. It makes little sense to keep an expensive fungicide with a possibly short shelf life sitting in your shed, waiting for a disease that may never make an appearance in your garden, but a lot of sense to be able to get that chemical quickly should the need arise.