Powdery Mildew and Peonies 2014

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My lifetime recollection of weather related, plant-damaging events are numerous, going back into the mid-1930s. Drought, dust storm and deep freeze; more recently ice and microburst dumping tree tops into the tree peonies; mid-summer hail and wind ripping leaves from the peonies. And, while there have been plenty of years with abundant leaf fungi, it was not until 2014 that I noticed the striking sight of white mildew coating peony leaves. However, I know this is not entirely new. I have had a few inquiries about white coating on peony leaves throughout the recent decade, mostly coming from peony enthusiasts in the Eastern and Northeastern United States. The gist of my answers has been to refer the inquirer to the local office of the appropriate State Agricultural Extension Service for advice. Still relevant advice, but now I have had reason to make a more thorough investigation of the subject.

Mid-June, I spotted one peony, among thousands of them, having white coated leaflets on its exposed north side. By the next day when I returned with my camera it had rained. Much of the white layer was gone, it being made up of the infective spores produced by powdery mildew. By then the residual color was more grayish, as seen in the photo illustration herewith. The symptoms are first visible as small grayish white spots. Under favorable weather conditions the spots expand, coming together across the leaf surface. With the wind blowing these spores, the various stages of development can be seen to progress to other plants from the earliest infection site, spread on air currents.

A web search did not turn up an explanation why powdery mildew is only now taking hold on peonies, while it has long been known to affect other commonly grown ornamental plants. Powdery mildew is understood to generally show up on susceptible plants beginning late spring when hot, humid days are followed by cool nights. That is the necessary environmental support. However, as with any plant disease, infection can occur only when there is the three-part combination of a host plant, the infective agent of the disease and a supportive environment present, all at the same time, sometimes referred to as the infective triangle. What we hear most about in the garden media is products for sale to prevent success of the infection. However, as with all peony leaf fungi the first line of defense is to clean up and destroy all infected plant parts at season's end, to reduce the next season infective pressure.

FALL CLEANUP TIP

Most of us get around to cutting down peony foliage after frost and maybe before the discomfort of winter, too often doing so late enough that many dried leaves have already fallen to the ground. When that is the situation, the desired recovery of those broken up leaves is pretty much a lost cause, thus the spores for next season overwinter right there where our peonies are growing. When we have had a season where there was notable disease occurrence, it is good to clean up the old peony tops before the leaves dry up, which is best accomplished well before frost. This logic applies to the management of disease risk from all leaf fungi, not just mildew.

Also, mildew preventative sprays, when repeated each time washed off by rain or following a label-recommended interval, can interrupt the infective cycle. Doing so, however, is not pleasant and requires quite a commitment. Interesting, perhaps, I noticed a recipe for a homemade spray on a website, a Massachusetts Master Gardeners' document: in a quart of water add a few drops of liquid dish soap and a teaspoon of baking soda. If it works it might be less off-putting to mess with than a stronger chemical, but it would seem to be easily washed off by a small rain.

PEONY BREEDERS

The best solution of all will be to find wanted ornamental qualities in new peonies that also show resistance to mildew infection of leaves and stems. While it is too early to draw conclusions as to resistance sources in my presently available peonies, I do note the visible symptoms of the infection spreading outwardly show up minimally or not at all on some cultivars (cultivated varieties), especially among the woody peonies and herbaceous hybrids. The differences in infection could be because the prevailing wind spreads most spores in a different direction or merely how far away the less affected peony. However, when I see a plant that is largely or entirely free of disease next to a severely infected kind, it strongly suggests inherent resistance, definitely of breeder interest.. In any case as a grower of hundreds of different peony cultivars, I am convinced there is inherent resistance out there among the peonies presently available, waiting for our selection, as well as for use in breeding disease resistant new peonies.