Anthracnose Diseases and Their Control with Fungicides

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We have been working on the broad grouping of diseases known as anthracnose. There are quite a number of different fungi that are sometimes relegated to this group including: *Colletotrichum, Coniothyrium, Diplodia, Discula, Gloeosporium, Glomerella, Macrophoma, Phoma, Phyllosticta* and *Phyllostictina*.

Anthracnose diseases are usually characterized by leaf spots and blight but also can cause stem rot and fruit rot on some crops. Diagnosing anthracnose can be challenging since many people do not recognize that the leaf spots and cutting rot found in propagation are due to the same pathogen as shoot dieback later in the production cycle. If you do not achieve control of the propagation phase, you will be fighting a generally losing battle a year or more later when the dieback phase becomes obvious. These diseases spread by spores that are easy to splash with irrigation water or rainfall but since they are somewhat sticky they do not easily spread by simple air movement from the wind or fans. Wounding can increase disease severity but it is not necessary. Since the dieback phase often looks like mechanical damage the question of whether the disease or the damage is first is hard to answer.

Hydrangea anthracnose caused by *Phyllosticta* sp.

Many plants can be attacked by anthracnose fungi especially those grown outside of greenhouses like woody ornamentals and tropical foliage plants. There are far fewer

examples in greenhouse potted crops and the bedding plants. Some of the most commonly affected are *Camellia,* cyclamen, *Euonymus, Ficus* (many species), *Hydrangea, Hosta, Vinca minor*, lupine, azalea, *Aglaonema, Cordyline, Dieffenbachia*, palms, yucca, cacti and succulents.

Euonymus anthracnose caused by *Phyllosticta* spp.

Research published in the 1960's showed that the *Glomerella cingulata* (*Colletotrichum* spp.) present in the greenhouse and nursery trade at the time were not host specific. That is, an isolate from a plant like Ficus was capable of infecting the other plants tested and visa versa. This is important in deciding which plants might need protecting. Unfortunately, I have not seen any more recent studies. However, the fact that so many different pathogens are lumped into this "anthracnose" category makes crossing from one plant to another less likely. For example, the anthracnose fungus that infects oaks does not attack sycamore. In contrast, many of the greenhouse anthracnose diseases are caused by *Colletotrichum gloeosporioides* and the chances of infecting other plants are far greater.

Oak anthracnose caused by *Discula quercina.*

The majority of the ornamental research (often simple fungicide trials) has been conducted on anthracnose diseases of azalea, *Euonymus*, lupine and *Vinca minor*. The pathogens have usually been *Colletotrichum* spp. In the northeastern states the *Colletotrichum gloeosporioides* responsible for Euonymus anthracnose has developed resistance to previously effective fungicides. In California, Euonymus anthracnose is sometimes caused by Colletotrichum but as often found to be caused by Phyllosticta. Similarly both pathogens are found on Hydrangeas with anthracnose.

Over the past 10 years Chase Horticultural Research has completed about a dozen trials on camellia, cyclamen, Cordyline, hydrangea, euonymus, Mandevilla, sycamore or vinca. The work was sometimes conducted as curative (Cordyline, vinca, Mandevilla and euonymus) trials and sometimes as preventative (cyclamen, camellia and hydrangea) trials. The table below summarizes the results of most of these trials. I did not include unregistered products in this review although many have been included in our trials.

Sycamore anthracnose caused by *Discula platani*

Our experience with these pathogens indicates that diseases caused by *Colletotrichum* spp. are somewhat faster to develop than those caused by *Phyllosticta* spp. They can look very similar, unfortunately, knowing which one you have can be critical for optimal disease control. Control was nearly always better when fungicides were applied on a 7 or 10 day interval compared to a 14 day interval. This was especially apparent with the Colletotrichum anthracnose. For this pathogen, spraying weekly in a preventative manner is necessary to obtain the optimal results. In contrast, we did most trials on Phyllosticta using a 14 day interval and control was very good to excellent with some products. In a case where control was none-good the shorter interval provided the better control.

The best products for both Colletotrichum and Phyllosticta were Daconil Ultrex (chlorothalonil), Pageant (pyraclostrobin and boscalid) and Spectro 90WDG (chlorothalonil and thiophanate methyl). If you obtain a diagnosis of a particular problem then you can choose among quite a number of other fungicides that can give good to excellent results. However, if you guess about the cause and are wrong you may choose the wrong product and the result will be poor. For instance if you have Colletotrichum leaf spot and dieback on hydrangea and choose to control it with Insignia on a 14 day interval your results may be poor. If however, you choose to use Pageant on a 14 day interval you can control both Colletotrichum and Phyllosticta on hydrangea (we find both routinely in our diagnostic lab).

Conclusions

The first step in solving any disease problem is a good diagnosis. Please take the time to send in a sample to a diagnostic lab to make sure your control strategy is the best one available for your situation. Guessing costs time and money. The second step is to

change the environment to reduce disease severity. While this can be exceptionally effective in a greenhouse or sometimes a nursery, clearly for landscapes this is not as easy to manage. The third step is to choose the best program for you needs. Read the labels as carefully as you can and ask for help if you are not sure. If you cannot spray weekly, then choose the best product you can afford and spray it at the higher end of the labeled rates. Be sure to alternate products from different chemical classes. Anthracnose diseases have repeatedly been shown to develop resistance when a single mode of action was used without rotation. Finally, get an accurate diagnosis. Oh – Yeah – I am repeating myself since this step is usually the last one chosen and not the first.

Anthracnose on Hosta caused by *Colletotrichum gloeosporioides*.

Table – Summary of trials on anthracnose fungi conducted by Chase Horticultural Research, Inc.

Chemical	rates	interval	Efficacy Colletotrichum	efficacy Phyllosticta
Banner MAXX	6 oz	14 days		good
Camelot	16 oz	14 days	good	
Chipco 26019	16 oz	7-14 days	none-some	
Cleary 26/36	64 oz	7 days	good	
Cleary 3336	16 oz	14 days		none
Clevis	16-32 oz	7-14 days	very good	some
Compass O	4 oz	14 days		none
Daconil Ultrex	22 oz	7-10 days	some-excellent	good
Dithane	24 oz	14 days	very good	
Eagle	2-4 oz	10-14 days	none-good	very good
Heritage	2-4 oz	7-10 days	none-very good	good
Insignia	8-10 oz	10-14 days	none-some	good-excellent
Medallion	4 oz	7-10 days	none-good	very good
Pageant	12.5-18 oz	7-14 days	very good-excellent	excellent
Pentathlon	24 oz	7-14 days	very good	
Phyton 27	15-25 oz	7-10 days	very good-excellent	
Protect T&O	16 oz	14 days	some	
Rhapsody	128 oz	7-14 days	good	
Spectro	24 oz	7-14 days	excellent	very good-excellent
Terraguard	8 oz	7-14 days	none-excellent	none