

Pest Alert

FDACS-P-01690
Updated April 2016

Florida Department of Agriculture and Consumer Services, Division of Plant Industry
Adam H. Putnam, Commissioner of Agriculture

Daylily Rust *Puccinia hemerocallidis*

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In a telephone conference call with federal and southeastern state plant pathologists on December 8, 2000, the Florida Department of Agriculture and Consumer Services became aware of a new foliar disease of daylily (*Hemerocallis* spp.) in the US. The disease goes by the common name daylily rust. Although the pathogen was initially thought to be *Puccinia hemerocallidis* Thuem., some inconsistencies in spore morphology with the original literature description were uncovered, namely the predominance of one-celled teliospores (mesospores) and thin urediospore walls. While the taxonomic significance of these features was being further evaluated, plant pathologists agreed to assign a provisional name of *Puccinia* sp. to the pathogen until comparisons were made between specimens of daylily rust from locations in the southeastern US and voucher specimens of other rusts on plants in the Liliaceae. That comparison has been completed, and the consensus is that *P. hemerocallidis* is the proper name for the rust pathogen recently discovered in the Southeast US.

Now that the daylily rust pathogen in the US has been confirmed as *P. hemerocallidis*, the following facts can be utilized:

Puccinia hemerocallidis is native to Asia (China, Japan, Taiwan, USSR, and Ryukyu Islands) and may have been introduced into the United States by way of plant material originating from Central America. USDA-APHIS port officers in Miami, Fla., report that daylily plant material enters the US from Costa Rica, Guatemala, Honduras, Mexico, Bahamas, South Africa, and the Netherlands on a regular basis through their facility. Further traceback of the arrival of the rust into the Western Hemisphere is underway. At the time the disease was first recognized in the US, the rust was known to occur South Carolina, Georgia, Alabama, and Florida. As of June, 2001, the rust is also now reported from California, Mississippi, Minnesota, Texas, and Tennessee.

The rust pathogen is heteroecious. The spermatogonial / aecial host is *Patrinia* spp. in the Valerianaceae. The uredial / telial host range is restricted to the genus *Hemerocallis* in the Liliaceae, with questionable pathogenicity on *Hosta*, also in the Liliaceae. The rust is capable of perennating on daylily alone. The involvement of *Patrinia* in the current situation is unknown. It is not a common ornamental plant in Florida, and no rust infections have been discovered on *Patrinia* spp. or *Hosta* spp. in the US so far. The pathogen causes typical, raised yellow-orange to rust-brown pustules on daylily leaves, most prominent on the underside of the leaf. The lesion may be nothing more than a fleck on more resistant varieties.

Please submit fresh leaf samples of Florida origin to FDACS-DPI Plant Pathology Section (PO Box 147100, Gainesville, FL 32614-7100) if you encounter suspicious symptoms. Except for daylily leaf streak disease caused by *Aureobasidium microstictum* (Bubák) W. B. Cooke (See DPI Plant Pathology Circular #376, <http://www.doacs.state.fl.us/pi/enpp/pathology/pathcirc/pp376.pdf>), other daylily diseases do not resemble daylily rust. (For a discussion of some other daylily diseases in Florida, see Nematology Circ. 219, <http://www.doacs.state.fl.us/pi/enpp/nema/nemacirc/nem219.pdf>).

Field observations so far in the southeastern US reveal the following:

1. There is a considerable range in susceptibility among the daylily varieties grown here, some being very susceptible, others largely unaffected.
2. New infections arise in as little as 2-3 days on susceptible varieties.



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3. So far, varieties most often infected are Attribution, Pardon Me, Gertrude Condon, Crystal Tide, Colonel Scarborough, Starstruck, Joan Senior, Imperial Guard, Double Buttercup, and the very popular Stella D'Oro.

4. In some nurseries, the rust has been found on plant material which arrived recently from Costa Rica. Costa Rican plant material recently obtained from brokers should be examined carefully.

5. During this interim period while the distribution and impact of daylily rust in the US are still being determined, stop sale orders should be issued on the symptomatic plants to prevent unnecessary rust distribution by movement of obviously infected plants. Judging by recent developments however, it is likely that in the future daylily rust will be treated as a quality rather than a quarantine plant pathogen throughout the US.

6. As of June, 2001, the general opinion of the state and federal plant pathologists knowledgeable about daylily rust is that the disease will be impossible to contain by regulatory means. The rust pustules develop too quickly and plentifully to expect plant inspectors to be able to identify and eliminate every source of inoculum before spores are carried far and wide by the wind. Since daylilies form a continuum of susceptible host tissue in most of the US, rust spores will likely be able to infect daylily nationwide within a relatively short time frame. A consideration of the "Puccinia Pathway" of stem rust of wheat in North America may provide a fairly accurate predictor of the spread of daylily rust.

CONTROLS

1.a. Carefully remove and destroy infected foliage from plants on which rust is detected and on all the remaining plants in that block or bed. Apply alternately two of the following four fungicides at the label rate and interval to protect new foliage as it emerges:

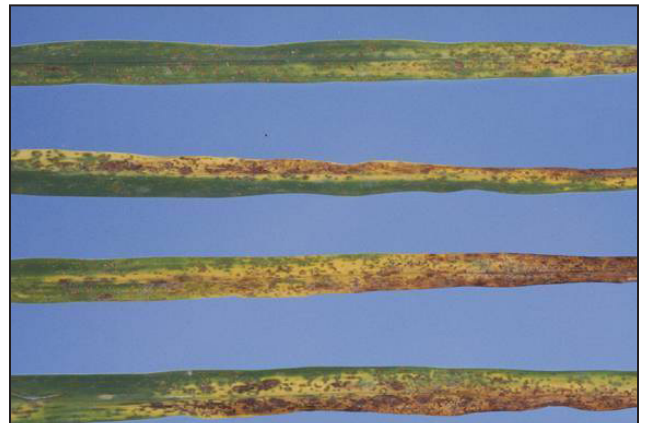
- propaconazole (Banner Maxx)
- azoxystrobin (Heritage)
- flutolonil (Contrast)
- myclobutanil (Systhane)

Formerly infected blocks or beds treated in the above manner that regrow a symptomless canopy (6-10" leaves) are eligible for interstate phytosanitary certification. **OR**

1.b. The nursery may opt to safely destroy all infected plants rather than try to regrow a symptomless canopy. It is likely that certain extremely susceptible varieties will need to be eliminated from the inventory in order to protect less susceptible varieties from high inoculum pressure and subsequent disease development.

2. Blocks or beds that have been inspected and are symptomless but in the same nursery with plants that have rust are eligible for interstate phytosanitary certification after they have been treated with one of the above fungicides. It is no longer necessary for all daylily blocks or beds in a nursery with rust to be treated as specified in #1 above. Only rust infected blocks or beds require **EITHER** 1.a. (cut back, fungicide treatment and regrowth prior to being certified), **OR** 1.b. (destruction).

A number of plant pathology labs are studying all aspects of this new disease. All information presented here is subject to correction and amendment as more is learned about this disease in the US and Florida. Further information is available at the National Plant Board Web Site (<http://nationalplantboard.org/>).



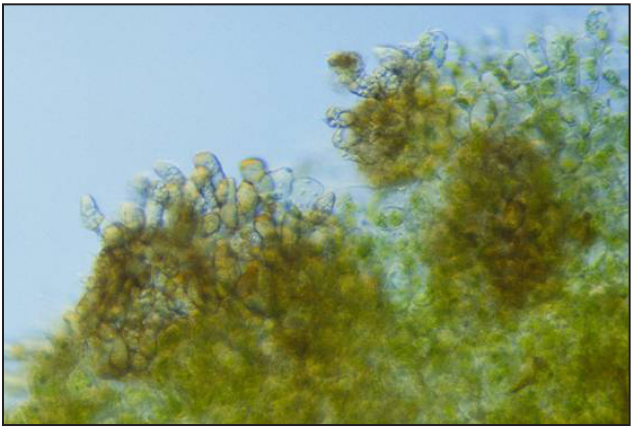
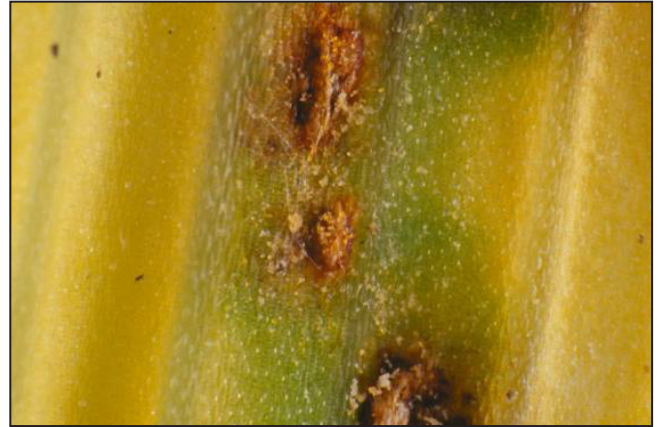
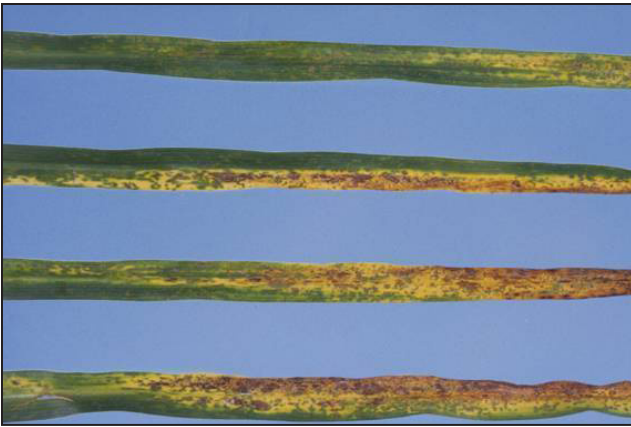




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