

Chrysanthemum white rust *Puccinia horiana*

Chrysanthemum white rust is a serious fungal disease of ornamental chrysanthemum and daisy. Native to Asia, this pathogen has previously been detected in the United States, including Michigan, but was subsequently eradicated or is being eradicated. The disease can spread rapidly in nursery and greenhouse environments and render the whole crop production unmarketable. As a federally regulated pathogen, detection of this disease will lead to quarantine and eradication procedures.

[Michigan risk maps for exotic plant pests.](#)

Systematic position

Fungi > Uredinales > Pucciniaceae > *Puccinia horiana*
Hennings

Global distribution

Asia: China, Japan, Korea, Malaysia, Russia, Taiwan, Thailand. **Africa:** South Africa, Tunisia. **Europe:** Most countries. **North America:** Mexico; **South America:** Argentina, Brazil, Chile, Columbia, Uruguay, Venezuela.

Quarantine status

Localized introductions of chrysanthemum white rust have occurred in a number of locations in the United States (CA, CT, DE, MA, MI, NJ, NY, OR, PA, RI, WA) and Canada since the early 1990s and have been subsequently eradicated or are being eradicated. These cases of invasions were detected in greenhouse and nursery facilities and backyard gardens.

In 2008, chrysanthemum white rust was detected for the first time in a Michigan nursery (Rizvi 2008). The source of infection appeared to be a shipment of chrysanthemums from a nursery in Pennsylvania. No further infection has been found in Michigan after the regulatory actions taken by the Michigan Department of Agriculture.

Chrysanthemum white rust is a federally quarantined disease in the United States. Detection of the disease must be reported to regulatory authorities and leads to eradication efforts. Plant quarantines are used to restrict the importations of host plants from countries where chrysanthemum white rust is known to occur as well as domestic transportations. View the USDA-APHIS-PPQ's federal management plan for chrysanthemum white rust eradication at http://www.aphis.usda.gov/plant_health/plant_pest_info/cwr/downloads/cwrplan.pdf

Plant hosts

A host range is limited to 12 or so species of chrysanthemums and daisy in the genera of *Chrysanthemum*



Symptoms of chrysanthemum white rust infection on chrysanthemum leaves. Upper (left) and lower (right) leaf surfaces. (Photo: Division of Plant Industry Archive, Florida Department of Agriculture and Consumer Services, Bugwood.org).



Infected chrysanthemums. (Photo: SRPV, Bourgogne Archive, Les Services Régionaux de la Protection des Végétaux, Bugwood.org).

and *Ajanía* (Asteraceae), including pot mums, spray mums, garden mums (*C. morifolium*), Nippon daisy (*C. nipponicum*), and High daisy (*A. pacifica*).

Biology

Chrysanthemum white rust infects susceptible chrysanthemum and daisy varieties and completes its life cycle within a single plant host. A new infection is initiated by spores that land on a host plant surface, germinate, and penetrate inward under wet conditions. The fungus grows in the plant as a latent infection, and then appears on the plant surface as pustules on the underside of the leaves. Humid and cool conditions lead to production of infectious



Pustules of chrysanthemum white rust on lower surface of chrysanthemum leaf. (Photo: Division of Plant Industry Archive, Florida Department of Agriculture and Consumer Services, Bugwood.org)

spores on the pustules which may spread to new hosts via wind, water splash, contaminated soil, litter and hands. Infected plants may not show the external symptoms during hot, dry weather.

Symptoms

Look for the symptoms on young leaves during cool, moist periods.

- Light-green to yellow dimpled spots up to 5 mm in diameter on the upper leaf surface. Spots become brown and larger with age.
- Raised beige to pink pustules on the lower leaf surface. Pustules become white with age.
- Severely infected leaves will dry up and hang along the stem.

There are other rust fungi infecting chrysanthemums and proper identification is essential.

Management notes

Foliar treatments with triazole or strobilurin fungicides have been effective for exclusion of chrysanthemum white rust in the United States, although resistance to these fungicide classes has been reported in England (Wise et al. 2004). Chemical control recommendations are listed (Ockey and Thomson). Incineration or deep burial was used to destroy chrysanthemum white rust infected plants during its outbreak in Connecticut (Rizvi 2007).

Economic significance to Michigan

The production of floriculture crops such as cut flowers, flowering potted plants, and bedding plants is a booming industry in the United States and Michigan (Wise et al. 2004). Introduction of chrysanthemum white rust can seriously damage horticultural and floricultural industries as the disease can spread rapidly in nursery and greenhouse environments and render the whole crop production unmarketable. In England, where chrysanthemum white rust was introduced from Japan, eradication campaigns and quarantine measures were in place for more than 20 years. However, these measures were ultimately unsuccessful and the quarantine was lifted (Wise et al. 2004).

Likely pathways of entry to Michigan:

Chrysanthemums imported for nursery stock, propagation, and cut flowers.

*****If you find something suspicious on a susceptible host plant, please contact MSU Diagnostic Services (517-355-4536), your county extension office, or the Michigan Department of Agriculture (1-800-292-3939).*****

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