

## ASPARAGUS RUST

Asparagus rust, caused by the fungus *Puccinia asparagi*, was first reported in Europe in 1805, and its first observation in the United States (US) was in New Jersey in 1896. By 1902, the disease was reported in all asparagus growing areas in the US and Canada. Asparagus rust is an autoecious (single host) disease, and all spore types of the pathogen are produced on asparagus. *P. asparagi* infects spears and ferns of the host. The disease reduces plant vigor and yield.

### Symptoms

In spring, teliospores produce basidiospores that infect spears. Following the infection, oval, light-green lesions about 6 x 19 mm in size are produced (Figure 1). The lesions turn cream-orange, become sunken in the center, and produce aeciospores. Aeciospores are wind-borne, infect asparagus shoots, and produce reddish-brown, blisterlike pustules (uredinia) (Figure 2). Uredinia produce rust-colored spores (urediniospores) that cause new infections throughout the summer. The uredinial production cycle repeats every 10 to 14 days during July and August and causes the majority of fern damage. In early fall, telia with teliospores replace uredinia (Figure 3) and serve as the overwintering stage. Teliospores and urediniospores may occur within the same pustule. Severe rust infections cause stunting or death



Figure 1. Aecial lesion of *Puccinia asparagi* on stems of asparagus: Left (courtesy of D. Johnson), right (courtesy of CABI).



Figure 2. Uredinial pustules of *Puccinia asparagi* on the ferns of asparagus (courtesy of CABI).

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of young shoots.

## Disease Cycle

The pathogen overwinters on infested plant residue in the form of teliospores.

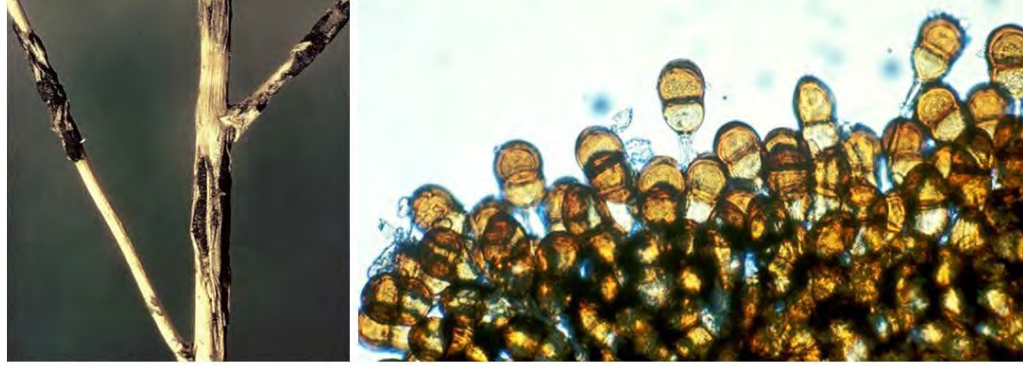
Teliospores germinate early in the spring to produce basidiospores. Basidiospores cause infection in emerging asparagus spears.

Basidiospore infection

results in the production of spermagonia and aecia on the host, as light green, oval lesions.

Aeciospores produced in aecia, are dispersed by wind, and infect plants producing uredinia and urediniospores. Urediniospores are also wind-borne. If weather conditions are suitable, multiple cycles of urediniospores productions and infections may occur during the growing season.

Infection by urediniospores occur in wet conditions. Telia and teliospores form at low temperatures or during periods of dry weather. Teliospores survive during winter and produce basidiospores in spring.



*Figure 3. Telial pustules of Puccinia asparagi on the stem of asparagus (left), and two-celled teliospores of P. asparagi (right) (courtesy of CABI).*

## Disease Management

The following practices are recommended for managing asparagus rust.

- Cultural practices: removal of infested crop residues, destruction of wild or volunteer asparagus plants, and locating new plantings away from established plantings reduce the incidence of the disease. Practices that promote the rapid drying of plant surfaces, such as planting rows in the direction of the prevailing wind, help to reduce infection.
- Resistant cultivars: resistant and tolerant asparagus cultivars may be considered for production, if they are available.
- Chemical management: registered fungicides can be used to control asparagus rust. The following fungicides are registered and recommended for control of asparagus rust in the Midwestern states: chlorothalonil products (Bravo, Echo, Equus, Initiate); Dexter Max; mancozeb products (Dithane, Koverall, Manzate, Penncozeb, Roper DF); Rally; Sonoma; tebuconazole products (Monsoon, Onset, Vibe); and Unicorn.