



WHITE MOLD OF JERUSALEM ARTICHOKE

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White Mold of Jerusalem Artichoke

This fact sheet provides information on white mold of Jerusalem artichoke for commercial growers and home gardeners. Jerusalem artichoke (sunchoke, *Helianthus tuberosus*) is a Native American food plant closely related to the common sunflower (*Helianthus annuus*). The edible tubers contain inulin, which converts to fructose with cooking, a sweetener preferable to sucrose for diabetics (Kays and Nottingham 2008; Yang et al. 2015). The tubers of Jerusalem artichoke are gaining popularity as an alternative to other carbohydrate foods and are therefore increasing in availability in retail grocery outlets. Essentials of cultivation are provided in Cosgrove et al. (2013) and, specifically for Washington state, in Miles et al. (2013).

Identification

White mold is a major disease of both Jerusalem artichoke and sunflower. Sometimes called Sclerotinia stem rot, it is caused by the fungus *Sclerotinia sclerotiorum*. Initial symptoms of white mold on Jerusalem artichoke typically appear in late summer and first appear as wilting tops. Eventually, tops form a curled and drooped “shepherd’s crook” as leaves darken and become dry (Fig. 1).



Fig. 1. Wilting symptoms of white mold on Jerusalem artichoke in a home garden.

These wilting symptoms are accompanied by dense white mycelium (fungus threads) at the base of plants and on roots (Figs. 2 and 3). Observed on close inspection are dark sclerotia (compact survival structures usually about 1/16 to 1/8 inch in diameter, sometimes larger) with a whitish interior (Figs. 3 and 4). Wilting, white mycelium, and the sclerotia are, in combination, diagnostic for white mold. Sclerotia (Fig. 4), along with mycelium, may occur on tubers in the soil or in storage.

Life cycle

Microscopic ascospores are a key inoculum of white mold on Jerusalem artichoke. During cool, moist conditions, these spores are released from small (often less than a quarter-inch wide), cup-shaped, brown apothecia. These spores germinate under high humidity. Subsequent growth on a food base of senescent or dead plant material is required in order to infect the living host. These conditions are usually found in the shaded lower canopy of the plant.



Fig. 2. Dense white mycelium on lower stalk and upper root of Jerusalem artichoke.

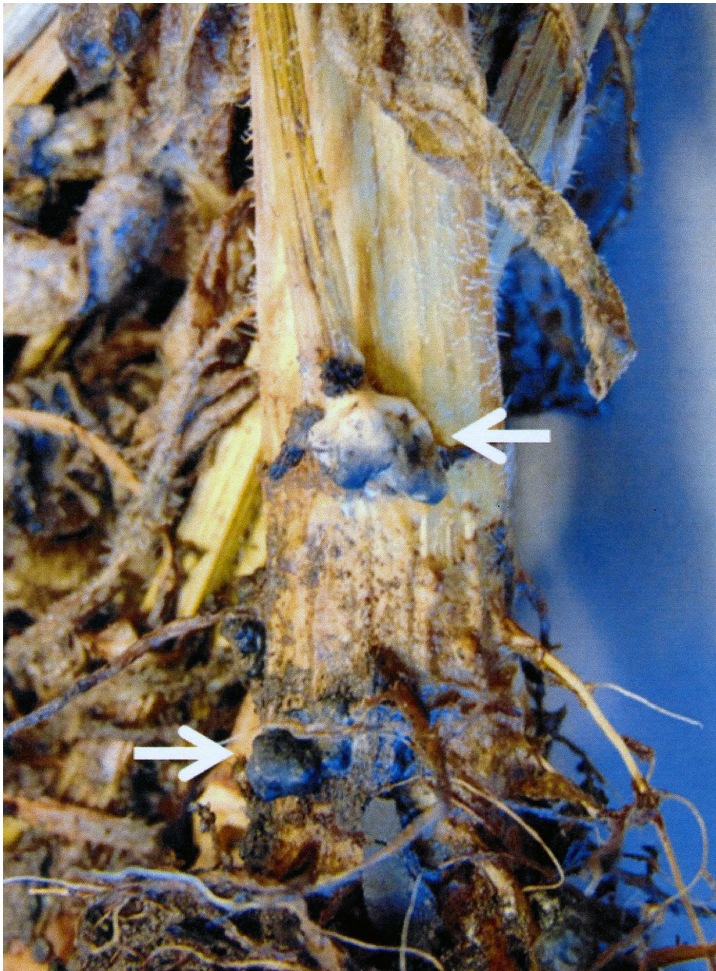


Fig. 3. White mycelium (upper) and a sclerotium (lower) indicative of white mold.

Once infection occurs, profuse white mycelium is produced, and, eventually, sclerotia are formed. Sclerotia can later germinate to directly infect a host, or they may germinate to produce more apothecia (Heffer Link and Johnson 2007). Sclerotia can be transported on tools or other equipment, or by movement of the soil. Very tiny spores (microconidia) are sometimes produced, but they seem to play no role in infection and their function is yet unknown.

Management

Once white mold has become established in a field, it is very hard to manage because of the extensive host range of over 400 plant species (Farr and Rossman n.d.). Also, sclerotia can ordinarily survive anywhere from two to six years in the soil (Ben-Yephet et al. 1993; Cooley-Smith and Cooke 1971). Because Jerusalem artichoke has limited varietal resistance to white mold (Kays and Nottingham 2008), crop rotation is essential. Rotate fields or beds into resistant crops, primarily maize (corn) or other plants in the grass family, for a minimum of three years (Heffer Link and Johnson 2007).

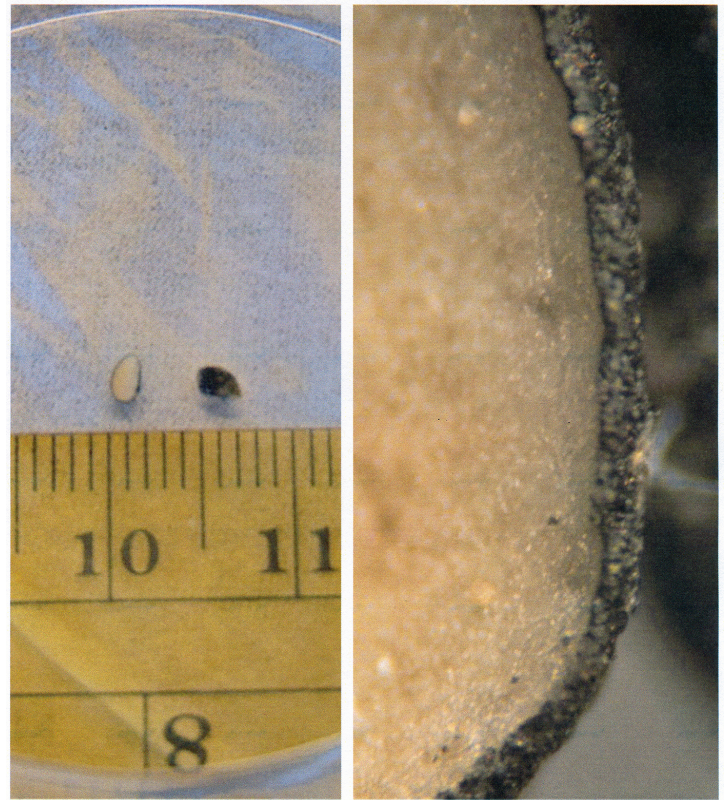


Fig. 4. Left: A typical sclerotium, bisected to show pale interior (ruler indicates millimeters; from 10 to 11mm is approximately 3/8 in). Right: Close-up of black, outer sclerotial rind and inner pale interior.

Another option in management of white rot is biological control. Biological control tends to work best in conjunction with other strategies, such as canopy reduction (to diminish humidity), weed control (because broad-leaf weeds may be hosts for the pathogen), and removal of crop residue and “volunteer” Jerusalem artichokes (to minimize food base for the pathogen). For information on biological control of white mold on *Helianthus* spp. (product label includes Jerusalem artichoke), see the [Pacific Northwest Plant Disease Management Handbook](#).

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