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THE WHITE RUSTS, ALBUGO SPP.

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The white rusts are not true rust fungi, but are more closely related to the damping-off fungi, such as Pythium and Phytophthora, and the downy mildews of the order Peronosporales (1). They are called white rusts because of the white rust-like pustules which develop on infected tissue. These fungi belong to the family Albuginaceae which consists of only one genus, Albugo, which contains over thirty species. All are obligate parasites, organisms which can obtain food only from living protoplasm. The related downy mildews (Peronosporaceae) are also obligate parasites. In fact, in crucifers, the combined diseases of white rust and downy mildew are common.

Seven Albugo species have been reported in Florida (Table 1). Of these, A. candida (Pers. ex Chev.) Kuntze, which attacks the Cruciferae, and A. ipomoeae-panduratae (Schw.) Swing., which may damage sweet potato, appear to be the most serious threats to Florida agriculture.

TABLE 1: *Species* of Albugo and their hosts reported in Florida (2).

A. amaranthi (Schw.) Kuntze

Acnida cuspidata Bert. ex Spreng.

A. bliti (Biv.-Bern.) Kuntze

Amaranthus spp.
A. hybridus L.

A. candida (Pers. ex Chev.) Kuntze

Brassica hirta Moench
B. juncea (L.) Czerniak.
B. nigra (L.) W.D.J. Koch
B. oleracea L.
B. rapa L.
Lepidium sativum L.
L. virginicum L.
Raphanus sativus L.
Rorippa spp.

A. ipomoeae-panduratae (Schw.) Swing.

Convolvulus spp.
I. batatas (L.) Lam.
I. coccinea L.
Merrimia dissecta (Jacq.) H. G. Hallier

A. platensis (Speg.) Swing.

Boerhavia app.
Mirabilis Jalapa L.

A. portulacae (DC.) O. Kuntze

Portulaca oleracea L.
Portulacaria afra (L.) Jacq.

A. tragopogonis Pers. ex S. F. Gray

Ambrosia artemisiifolia L.
Cirsium horridulum Michx.

SYMPTOMS

With local infections, chlorotic spots are first evident on the upper surface of the leaves (Fig. IA). These are followed by clusters of pustules on the lower leaf surface which rupture and expose white powdery spore masses (Fig. 1B). Certain Albugo spp. which infect systemically may cause distortion, defoliation, and flower abortion (1). White rusts are widespread and are usually evident in Florida during

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cool wet periods. They are spread by air-borne sporangia and for short distances by water splashing of sporangia and zoospores. They may overseason as oospores in perennial hosts, on plant debris, or on seed (4).

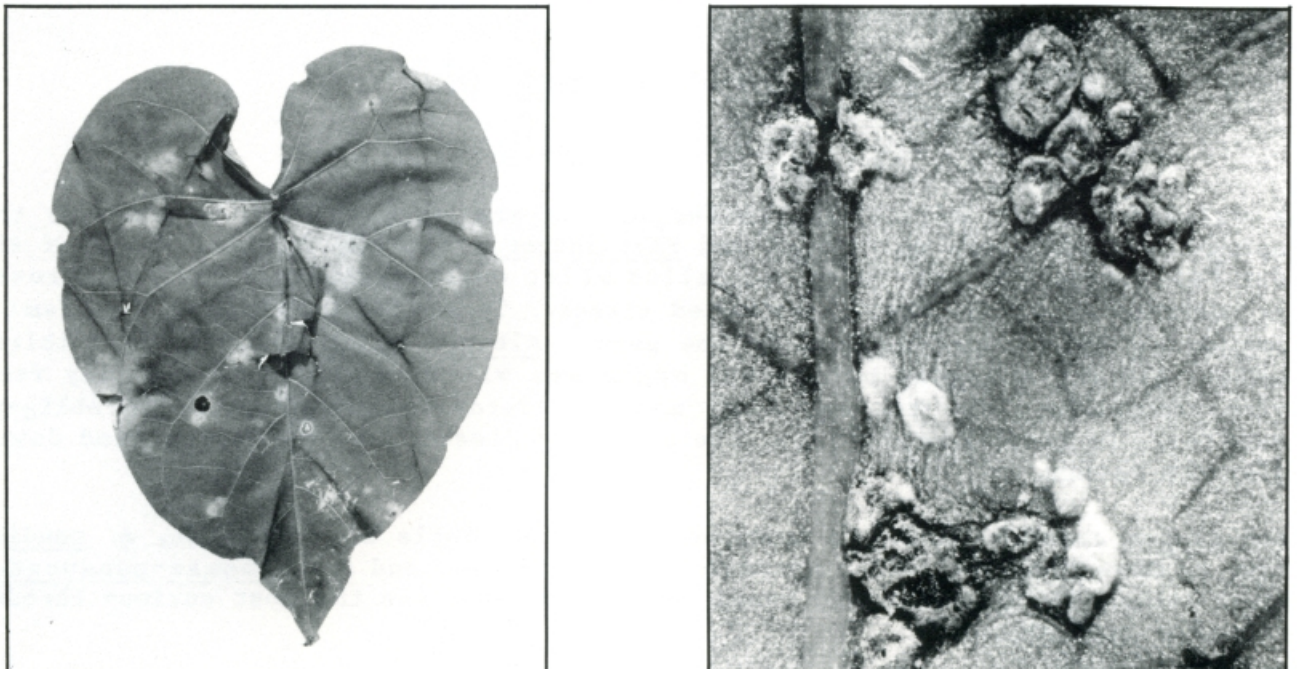

Fig. 1. A) Chlorotic leaf spots on upper surface of morning glory, Ipomoea indica, caused by Albugo ipomoeae-panduratae. (DPI photo No. 850114-9). B) Leaf undersurface with characteristic pustules of white rust. (DPI photo No. 850114-B-4).

CONTROL

Disease severity does not usually warrant control. If required, control can usually be achieved by removal of diseased plants, by crop rotation, or by the use of resistant varieties (3).

SURVEY AND DETECTION

Look for chlorotic spots on the upper leaf surface, followed by white rust-like pustules on the leaf undersurface.

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