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Rusts of ‘Ilima (*Sida fallax*)

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Plants in the Malvaceae family number about 1,500 species in 75 genera, including herbs, shrubs, and trees. Several malvaceous species endemic to Hawai‘i are hosts to nonnative rust fungi. These fungi attack the plant’s leaves, causing spots, curling, chlorosis, blights, and defoliation. These pathogens may have entered Hawai‘i on weedy hosts in this plant family. Some important indigenous Hawaiian hosts include *Abutilon grandifolium* (hairy abutilon; ma‘o), *Abutilon incanum* (ma‘o), *Abutilon menziesii* (ko‘oloa ‘ula), and *Sida fallax* (‘ilima) (Gardener and Hodges 1989). Here we discuss the rusts of ‘ilima and suggest integrated practices for their management in Hawaiian landscapes.

***Sida fallax* (‘ilima) in a Hawaiian landscape.**

Host

Sida fallax is indigenous to Hawai‘i, where its yellow flowers are used for lei. The plants are generally found as naturalized populations or as elements of residential and resort landscapes. ‘Ilima commonly occurs on each of the main Hawaiian Islands and throughout the Pacific. In Hawai‘i, ‘ilima grows along rocky or sandy coasts, on exposed limestone reefs and coastal lava fields, and in dry to moist inland forests. The morphological forms of ‘ilima vary considerably. Types with prostrate growth habits occur on arid, exposed coastal lands. Shrubbier forms grow in moist woodland habitats (Herring 2013; Wagner 1990). The prostrate form is commonly referred to as ‘ilima papa.

In West Hawai‘i, ‘ilima papa is far more common than the shrubby form; in recent years it has been utilized more and more as a replacement for wedelia (*Wedelia trilobata*), a ground cover considered invasive by many.

Pathogens and Symptoms

Two nonnative fungi cause leaf rust diseases of ‘ilima in Hawai‘i: *Puccinia heterospora* and *Puccinia malvacearum* (Gardener and Hodges 1989). Both pathogens infect a number of malvaceous hosts in the state, including *Abutilon* and *Sida* species and malvaceous weeds such as *Marva parviflora* (cheese weed). The two fungi cause similar symptoms; for example, symptoms caused by *P. heterospora* may resemble those caused by *P. malvacearum* on hosts such as ‘ilima and ko‘oloa ‘ula.

The symptoms of this rust disease are usually conspicuous. Raised brown spots with fuzzy-looking masses of fungal spores appear mainly on lower leaf surfaces. On the upper leaf surface the spots are sharply defined, circular, sunken yellow depressions. Leaves often curl and fall off prematurely.

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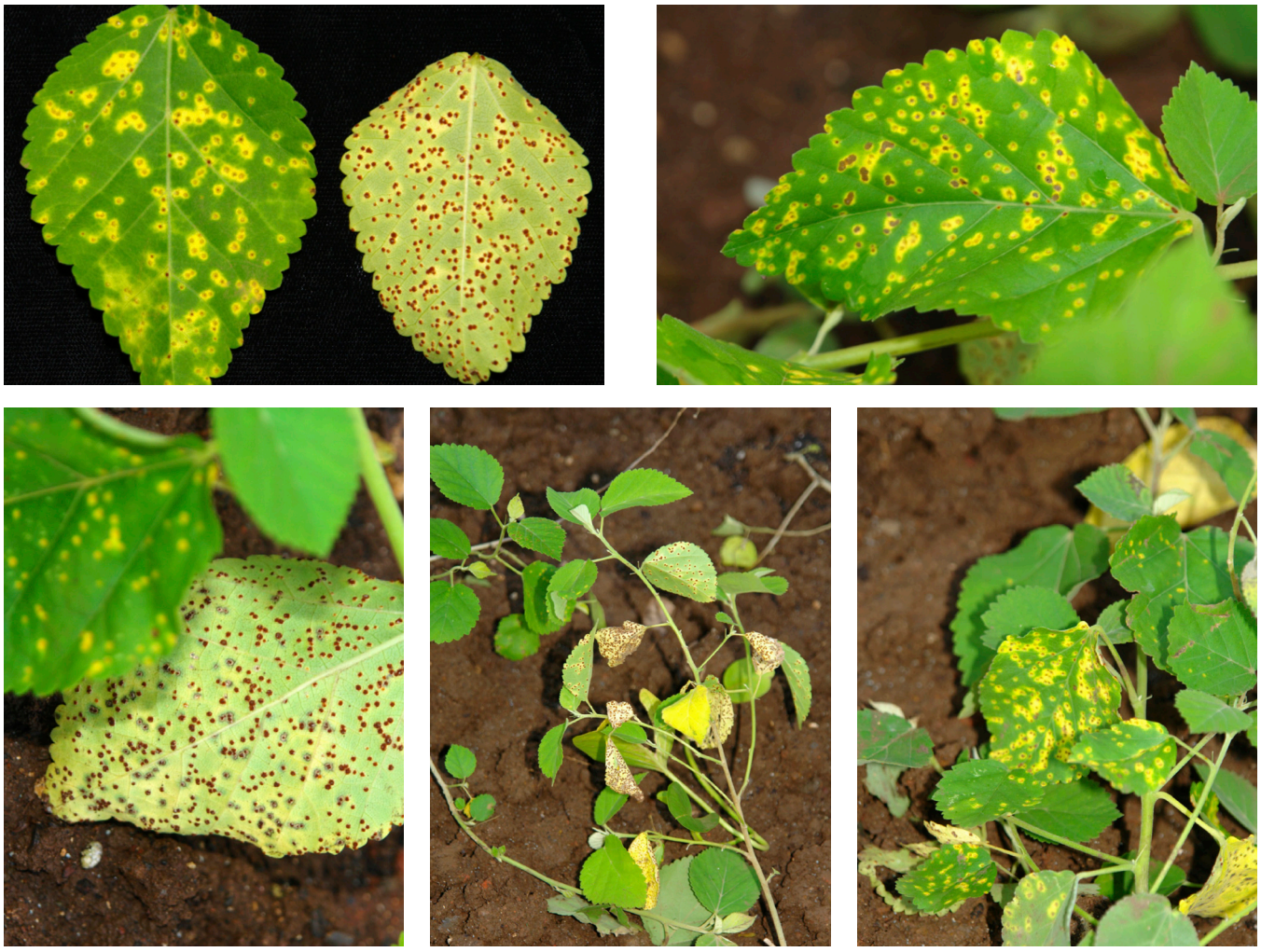

Top left and above left: *Puccinia* sp. rust spots on the upper (left) and lower (right) leaf surfaces of ʻilima. Top right, above center and right: Typical symptoms of rust include chlorotic spots and leaf curling.

Wind and splashing water disperse rust spores from the lesions of infected plants. Spores landing on leaves of the same or other plants can cause an infection, with leaf spots appearing quickly. New infections can produce spore-bearing lesions within 2 to 3 weeks. Millions of spores can be produced and rapidly infect many leaves, leading to extensive defoliation and weakening of the plant. Repeated cycles of infection and spore formation can occur yearly.

The two *Puccinia* species causing rusts on the malvaceous hosts in Hawaiʻi are difficult to tell apart. They are usually identified by differences only seen through a microscope or by DNA analysis. However, their disease management practices are identical.

Disease Management

Integrate cultural practices with fungicide applications as necessary.

Cultural practices

- Use disease-free plants when installing a landscape.
- Grow plants in dry, sunny locations. Space plants to provide air circulation in the plant canopy.
- Maintain adequate plant nutrition and vigor with appropriate fertilizer and irrigation practices.
- Periodically remove severely diseased leaves from the plants and ground surface and destroy them. Remove the first infected leaves, if possible.

Rust symptoms on the upper (left) and lower (right and below) leaf surfaces of hairy abutilon (*Abutilon molle*), a malvaceous weed that grows in semi-moist pastures and rangelands below 3,500 ft (1,066 m). These weeds should be destroyed to manage the rust on economic hosts, such as ‘ilima.

- Avoid overhead sprinkler irrigation.
- Destroy common mallow weeds such as *M. parvifolia* (cheese weed) or *Abutilon molle* (hairy abutilon) in the vicinity. They may be the source of the disease.

Fungicides

Fungicides may be needed to control or eliminate the disease symptoms. Always check the pesticide label to see if the product is registered for use on this plant in the landscape or other setting. Nonsystemic (protectant) fungicides include ferbam, mancozeb (e.g., Dithane® and Manzate®); sulfur; and copper-containing fungicides. Bayleton® is a systemic (eradicant) product.

When applying a protectant fungicide, be sure to thoroughly wet the lower leaf surfaces. Apply protectants at 10-day intervals until the disease is controlled (unless the label specifies otherwise). With systemic fungicides, follow label directions. Fewer applications are usually required with systemic fungicides than with protectant fungicides, especially in wet conditions.

References to products in this publication are for your convenience and are not an endorsement or criticism of one product over similar products. Follow the label directions exactly, as required by law and to protect people and the environment from chemical exposure.

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