

## Maize American corn rust (042)

### Common Name

American corn rust, maize rust, southern rust

### Scientific Name

*Puccinia polysora*. Another rust, *Puccinia sorghi* (common rust of maize), occurs worldwide (see Fact Sheet no. 225). Often the two rusts occur together, requiring microscopic examination to tell them apart.

### Distribution

*Puccinia polysora*: Asia, Africa, North, South and Central America, the Caribbean, Oceania. It is more common in the tropics than *Puccinia sorghi*, especially at lower altitudes. It is recorded from American Samoa, Australia, Fiji, New Caledonia, Papua New Guinea, Samoa, Solomon Island, Tonga, and Vanuatu.

*Puccinia sorghi*: Asia, Africa, North, South and Central America, the Caribbean, Europe, Oceania. It is recorded from Australia, Cook Islands, Fiji, New Caledonia, New Zealand, Papua New Guinea, and Vanuatu..

### Hosts

*Puccinia polysora* - it is recorded on some grasses and relatives of maize in other countries; it has only been recorded from maize in Pacific island countries. Note, there is no alternate host for this rust and it lacks those stages of *Puccinia sorghi* that occur on *Oxalis*.

*Puccinia sorghi* - maize and *Oxalis* species (wood sorrel). This rust has two unrelated hosts, and different spore-producing stages occur on each. The sexual stages occur on *Oxalis*. Note, *Puccinia sorghi* does not infect sorghum!

### Symptoms & Life Cycle

The spots are produced in large numbers on both sides of the leaf (Photos 1-3), and also on the stem (Photo 4). They are round to oval, brown, up to 2 mm. The powdery spores, called 'urediniospores', are released in large numbers and spread by wind over long distances. The spores germinate in water on the surface of the maize and infect through natural openings (called 'stomata'). The rust is most severe on the lower leaves, which may dry up and die prematurely.

Survival occurs as another spore type called 'teliospores'. These develop in the pustules of the urediniospores and can be seen as black spots. The teliospores are two-celled, dark, with thickened walls.

Warm, humid weather, such as occurs in Pacific island countries, favours the development of the disease.

The disease is called 'rust' because of the powdery spores. If you wipe a finger over the leaf, it appears similar to touching rusty iron - a fine dark brown stain remains.

### Impact

The disease is usually of minor importance. Most spots occur on the older leaves; these dry and die earlier than those that remain uninfected, but the rust comes late in the growth of the plant, after the seeds have been filled. Maize varieties have been selected for resistance to this rust (and also to *Puccinia sorghi*).

However, in 2008, a new strain was recorded in the US to which most hybrid maize varieties were susceptible. Fungicides are needed to provide control.

### Detection & inspection

The rust usually appears late, after the appearance of the male flower or tassel. If the leaf is held against the light, the spots can be seen clearly. There is a dark centre surrounded by a yellow margin.

It is difficult to tell the difference between this rust (*Puccinia polysora*) and common rust (*Puccinia sorghi*). *Puccinia polysora* is more



Photo 1. Spots of American corn rust, *Puccinia polysora*, on lower leaves of maize.



Photo 2. Golden brown pustules of American corn rust, *Puccinia polysora*, on the underside of a maize leaf.



Photo 3. *Puccinia polysora* pustules (uredinia) on maize.



Photo 4. American corn rust, *Puccinia polysora*, on the stem or stalk of maize.

common on maize in the tropics, especially at lower altitudes. Microscopic examination is required to see the size of the urediniospores and the thickening of the walls of the teliospores; for this expert advice is required. A molecular test has been developed to identify each of these rust species.

## Management

### CULTURAL CONTROL

Cultural control is important. The following should be done:

Before planting:

- Do not plant maize next to plots that already have rust disease.
- The rust can be seed borne, but the spores survive for only 2 months, so infection from seeds is not usually a risk.
- Plant maize during the drier times of the year.

After harvest:

- Destroy volunteer plants as the rust can only survive on living plants.

### RESISTANT VARIETIES

There are resistant hybrids of maize and sweet corn to *Puccinia polysora*, and also to *Puccinia sorghi*. However, because of new strains (identified in the US) growers should ask retailers about the resistance of present varieties.

### CHEMICAL CONTROL

The use of fungicides against this disease is not recommended as the effect on yield is probably minor and their use would not be economic. If needed, copper and mancozeb would be effective.

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*When using a pesticide (even a biopesticide), always wear protective clothing and follow the instructions on the product label, such as dosage, timing of application, and pre-harvest interval. Recommendations will vary with the crop and system of cultivation. Expert advice on the most appropriate pesticide to use should always be sought from local agricultural authorities.*

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Information from CABI (2013) *Puccinia polysora* (American corn rust). Crop Protection Compendium. (<https://www.cabi.org/cpc/datasheet/45850/>); and from Smith D (2016) Southern rust is a rare but serious threat to Wisconsin corn crops. UW-Extension. (<http://wiscontext.org/southern-rust-rare-serious-threat-wisconsin-corn-crops>); and (including Photo 3) McKenzie E (2014) *Puccinia polysora*. PaDIL - (<http://www.padil.gov.au>).

Produced with support from the Australian Centre for International Agricultural Research under project PC/2010/090: *Strengthening integrated crop management research in the Pacific Islands in support of sustainable intensification of high-value crop production*, implemented by the University of Queensland and the Secretariat of the Pacific Community.

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