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Rust Disease of Wheat and Its Management

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Wheat (*Triticum aestivum* L. and belong to Poaceae family) was ranked first and globally considered one of the most important strategic food crops around the world and it is the most common food in many countries. Wheat represents an important source of more than 20% of the calories and about 23% of the protein in addition to minerals and vitamins of human consumption. It is a staple food for a large portion of the global population and is used to produce a variety of food products, including bread, pasta, cakes, and pastries. Which includes the bran, germ and endosperm, is particularly nutritious and has been linked to various health benefits, including improved digestion and lower risk of chronic diseases. The climate play role in the growth and development of wheat. Wheat is a cool-season crop and requires the temperate climate. Wheat prefers well-drained, fertile soil with good water-holding capacity. The loamy soils with a slightly acidic to neutral pH (6.0–7.0) are ideal for the growth and development of wheat crop.

Symptoms

(1) Black Stem Rust

- It's caused by *Puccinia graminis tritici*
- More severely attacked parts are stem
- It is most damaging during the flowering and grain-filling stages
- It is a macrocyclic, heteroceous rust
- Uredospores spread the infection
- Black stem rust is favored by hot days (25-30°C) and mid nights (15-20°C) and wet leaves from rain or dew
- The Aceiospore produced on Barberries, infect wheat leaves through stomata
- Alternate host- Berbery and Mahonia
- Appear in plains during Feb. to April (Iate stem rust)

(2) Brown (Leaf) Rust

- It's caused by *Puccinia recondite*
- It appears the earlier than the black rust
- Symptoms are produced after 7 to 15 days of infection
- Appear in January and attack the leaf lamina
- Small circular to oval yellow spots appear on the upper surface of leaf
- The spots develop into orange-colored pustules

- Pustules are dusty in appearance due to the large number of spores produced
- Alternate host- *Thalictrum* and *Isopyron*
- Pycnia and Aceia are formed on *Thalictrum* species
- *Isopyron fumarioides*

(3) Yellow (Strip) Rust

- It's caused by *Puccinia striformis*
- Yellow rust the appearance of yellowish-orange pustules arranged in long, narrow stripes on the leaves, leaf sheaths, glumes, and awns.
- Long, narrow yellow stripes develop on leaves.
- Severe early infection can result in plant stunting
- Also known as sheath rust
- Alternate host is not known
- It appear during Dec. to Jan. (Early rust)

Management

- Early sowing
- Follow mixed cropping and crop rotation
- Grwoing short and long duration crop
- Eradication of barberry trees around the wheat fields as well as volunteer plants
- Application of balanced fertilizer to the crop
- Cultivation of rust resistant variety: Np 710, Np 718, Np 770, Np 822 & 823, Np 825
- Use of fungicides: Propicnazole 25% EC
- Mancozeb 75% WP
- Tebuconazole 25% WG