

Yellow Rust Disease of Wheat (*Triticum Aestivum* L.) and Their Management

Priyanka Kumari Meena¹ and Yogita Nain¹

¹Ph.D. Scholar, Department of Plant Pathology, RARI, Durgapura, Jaipur

ARTICLE ID: 03

Yellow or stripe rust: - *Puccinia striiformis*

Symptom

The symptoms and signs of the disease include chlorotic or necrotic flecks, and formation of uredia, a pustule-like structure enclosing abundant amounts of yellow to orange urediniospores. Healthy heads due to a reduction in the length of the rachis and peduncle. All or a portion of the heads on an infected plant may exhibit these symptoms. While infected heads are shorter, the rest of the plant is slightly taller than healthy plants. Prior to heading affected plants have dark green erect leaves. Chlorotic streaks may also be visible on the leaves.



Figure: - Yellow or stripe rust of wheat

Favorable conditions:-

Infection during flowering is favored by frequent rain showers, high humidity and temperature. Pathogen inoculum and susceptible host are present, the development of wheat stripe rust disease depends even more on weather conditions such as moisture, temperature and wind. The major factors affecting *P. striiformis* germination, infection, latent period, sporulation, spore survival and host resistance are moisture, temperature and wind. Moisture

directly affects the urediniospore germination, infection and survival. Three hours of uninterrupted moisture is needed for urediniospore germination and infection to occur along with other necessary environmental conditions, such as temperature and light.

Disease Cycle

P. striiformis fungi belonging to the class *Basidiomycetes* and order *Pucciniales* is an obligate parasite with a hemicyclic lifecycle since it consists only of dicaryotic uredinial and telial stages. The teliospores can form haploid basidiospores to infect an alternate host; however, none has been identified for stripe rust to date. The sexual cycle of *P. striiformis* is unknown and urediniospores are the only identified supply of inoculum. Ears of infected plants emerge early. The spores released from the infected heads land on the later emerging florets and infect the developing seed. The disease is internally seed borne, while pathogen infects the embryo in the seed.

Management:-

- Destroy the crop residues of previous crop and weeds before sowing and after harvest.
- Bury the infected ear heads in the soil, so that secondary spread is avoided.
- Effective control of cereal rust diseases is possible mainly through utilisation of genetic resistance to the pathogen, and fungicides.
- Treat the seed with Vitavax @ 2 g/Kg seed before sowing.
- Growing resistant cultivars is the most cost-effective and eco-friendly approach to manage the disease.
- Foliar applications of tebuconazole 250 EC, propiconazole 25% EC, azoxystrobin, propiconazole and azoxystrobin, pyraclostrobin and propiconazole, trifloxystrobin were effective for controlling stripe rust when sprayed at the right time.

References:-

- Brennan, J.P. and Quade, K.J. (2004). Genetics of and breeding for rust resistance in wheat in India and Pakistan. ACIAR projects CSI/1983/037 and CSI/1988/014. ACIAR impact assessment series report 25. Australian Centre for International Agricultural Research, Canberra, Australia.
- Chen, X.M. (2005). Epidemiology and control of stripe rust (*Puccinia striiformis* f. sp. *tritici*) on wheat. *Canadian Journal of Plant Pathology*. **27**:314-337.



Chen, X. M., Wood, D. A., Ling, P., Pahalawatta, V., Yan, G.P. and Penman, L. (2004).
Control of wheat and barley rusts: 2003 progress report. Highlights of Research
Progress, Department of Crop and Soil Sciences.

