

Wheat Diseases and Their Management

(* Anu¹, D.K. Janghel¹, Ashish Bankar², Vivek K Singh¹ and Neeru¹)

¹Department of Genetics and Plant Breeding, CCS Haryana Agricultural University, Hisar-125 004, Haryana, India

²Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore - 453111, Madhya Pradesh, India

* anunaruka8@gmail.com

Wheat is the most important cereal crop cultivated worldwide which contributes substantially to human diet and food security. Wheat is an important food grain crop of Rabi season in India. For good crop harvest, quality seed, application of balance fertilizers, irrigations and other plant protection measure are pre-requisite. Wheat suffers from a number of diseases like rusts, smuts, bunts and powdery mildew, etc. hence good management of range of wheat diseases can be achieved when growers adopt a strategy that includes:

- ✚ Resistant / tolerant varieties
- ✚ Seed and/or fertilizer treatments
- ✚ Active monitoring of crops with a view to fungicide applications if required

1. Powdery Mildew:

Scattered masses of symptoms appear on disease progresses to upper leaves. attack and even the earheads is and grains formed



lighter in weight. The disease is more common in irrigated areas, because of the high humidity. Powdery mildew can be effectively managed by following ways:

- ✚ Grow resistant/tolerant varieties viz, WH 912, WH542 WH 896 and WH 283.
- ✚ Spray of soluble sulphur @ 2-2.5kg/ha in 400-500 litres on appearance of diseased symptoms.
- ✚ Avoid late sowing of timely sown varieties.

powder like the leaf. The from lower leaves Leaf dries in severe development of adversely affected are shriveled and

2. Loose Smut:

It occurs throughout the state in almost all commercially grown wheat varieties and causes yield losses. The disease is noticed at or after spike emergence when black powdery spike heads appear from infected plants. In smutted spikes, all the



spikelets are filled with black powdery mass of spore. The spore from diseased spikes are blown away by the wind and cause infection at the anthesis stage of the crop to the developing grains in the healthy spike heads and pathogen gets established in the embryo of seed. Such internally infected seed apparently looks healthy serves as a source of inoculum for the disease during next crop season. It has been observed that at boot stage the flag yellowing or tips drying of infected tillers can easily be recognised in the field from a distance and such tillers/ plants can be rogued out to control the secondary spread of the disease. Loose smut can be managed by following ways:

- ✚ Treat the seed with systematic fungicides *i.e.* Tebuconazole 2DS @ 1g/kg or carboboxin or carbendazium @ 2g/Km seed.
- ✚ Rogue out the diseased plants as soon as observed and destroy them by burning or burying in the soil.
- ✚ Durum wheat varieties *viz.*, WH 896 and WH912 are resistant to loose smut.

3. Flag Smut:

The disease is more important pronounced in light sandy soils. The disease can cause heavy losses if susceptible varieties are taken in the infested fields after year continuously. Symptoms of the disease are produced on leaf, leaf sheath, culms and ear heads but leaf and leaf sheath are more commonly affected, long narrow lead gray or black streaks or stripes running parallel to the veins are formed on leaf and other affected plant parts. These stripes are initially covered with ruptures and expose the fungus spores. The affected leaves drooping (flagged). Later the shredding takes place. The affected tillers remain sterile bearing no grains and if shrivelled with poor viability. The plants debris for in soil and disease



covered with ruptures and expose the fungus spores. The affected leaves become twisted and later the shredding takes place. The affected tillers remain sterile bearing no grains and if shrivelled with poor viability. The plants debris for

many years. The disease can be managed by following ways:

- ✚ Seed treatment with Tebuconazole 2DS @ 1g/kg or carboboxin or carbendazium @ 2g/Km seed.
- ✚ Rogue out the diseased plants and destroy by burning
- ✚ Grow resistant varieties *viz.*, WH 896 and WH 283 in infested yields year after year.

4. Brown Rust:

Brown coloured lesions or pustules are formed on leaf and leaf sheath. The pustules are scattered throughout the leaf areas. The disease is generally observed in second fortnight of February or 1st week of March. Disease intensity varies with growth stage of the crop. Grains are usually light and shriveled depending on disease severity.



The brown rust can be managed by following ways:

- ✚ Grow resistant varieties like WH 542, WH 1105, WH 896, WH1124, WH 912 WH 1105 and WH 3765
- ✚ Spray mancozeb or zineb @ 2kg/ha on the first appearance of the disease symptoms and repeat 2-3 sprays at 10-15 days interval

5. Yellow Or Stripe Rust:

Yellow rust has a distinguishable characteristic of producing light yellow, straight-sided pustules that occur in stripes between the veins of the leaves and occasionally on the heads. When the pustules reach maturity, orange-yellow spores are produced. Disease is recognised by the presence of linear chains of yellow rust pustules formed on leaf. The yellow rust causes losses if it appears in early seedling stage of the crop. In severe attack yellow pustules are formed on glumes of earhead and even on the awns. Disease usually appears during the month of January when average temperature is between 11-15°C. The yellow rust can be managed by following ways:



- ✚ Grow resistant varieties like WH 542, WH 1105, WH 1142, WH1124, WH 912 and WH 3765
- ✚ Spray mancozeb or zineb @ 2kg/ha at the appearance of the disease symptoms and repeat 2-3 sprays at an interval of 10-15 days or spray of propiconazole @ 1ml/litre of water or 200 litres of water per acre on just appearance of diseased symptoms

6. Karnal Bunt:

The disease has international importance and strict quarantine has been imposed by countries where it is not known. Its permissible limits at international level are zero per cent. Karnal bunt disease in the wheat seeds/ grains is observed only after threshing of the wheat crop and there are no symptoms of the disease in the standing crop. The disease grains are generally, partially or sometimes wholly converted into black powdery mass enclosed by pericarps of the seed. Freshly harvested diseased grains emit fishy rotten smell. During threshing the pericarp of the diseased grain ruptured and the exposed fungus spores stick to the surface of the healthy seeds which helps in built up of disease inoculum in the field. The flour prepared from seed lot having more than five per cent bunted grains imparts fishy odour, blackish colour of flour and makes it unfit for human consumption. The pathogen is seed as well as soil borne and infection takes place at anthesis stage of the crop by secondary sporadic through wind currents. The disease can be managed by following ways:

- Seed treatment with Tebuconazole 2DS @ 1 g/kg seed or Thiram @ 2g/kg seed for borne inoculum.
- Avoid cultivation of highly susceptible varieties like WH 147 and HD 2329 in disease prone areas or infested fields
- Grow resistant / tolerant varieties *i.e.* WH 283, Raj 3765, PBW 502, WH 896 and WH912.
- Follow 2-3 years crop rotation with non-host crop.



References

More detailed information can be obtained from:

1. Sardi cereal treatments (2011) (Published/Unpublished)
2. Wallwork H (2000) Cereal Disease: The Ute Guide (Book) GRDC

