

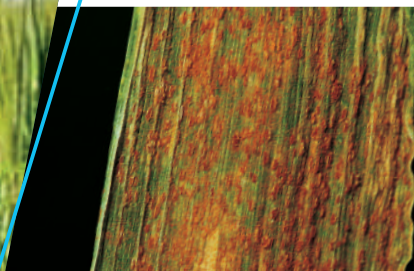


cereal FUNGAL DISEASES

Some plant parts play a pivotal role in yield potential, it is thus important to keep these parts healthy to ensure maximum yield and good quality.

	% Impact on yield	Fungal diseases have a negative impact on yield, therefore it is important to identify these diseases correctly.
Ear	45	
Flag leaf	35	
Second leaf from top	10	
Third leaf from top	10	

WHEAT



Leaf rust

Puccinia triticina f.sp tritici

Small round orange-brown pustules form on the surface of the leaf. The pustules can be rubbed off. These pustules are spread widely over the leaf and are round to oval in shape and are more likely on the upper leaf surface. Later in the season black teliospores develop underneath the leaves of mature plants.

The upper leaves normally get affected. Rust fungi survive on volunteer plants between seasons. The uridinio spores that form on volunteer plants act as an inoculum source of the disease for the next season.

The rust fungi can also be spread by the wind. Infection occurring before or during flowering is critical, especially if the flag leaf is infected. This leads to a decrease in the amount of grain per ear as well as decreased grain size.

Leaf rust causes more damage to late cultivars, especially if the weather is cool for long periods of time.

Powdery mildew

Blumeria graminis f. sp. tritici

Powdery mildew is characterised by a white, powdery fungus on the leaves, stem and ear.

The fungus appears on the lower leaves first. It develops fast under warm, moist conditions which alternate with warm and wet cloudy periods. High density planting as well as high nitrogen fertiliser increases the disease occurrence.

Plants are more susceptible during periods of growth, for example during stem elongation.

When wheat gets powdery mildew, the sap flow decreases and it gets difficult to control it chemically. Disease development is suppressed at temperatures above 25 °C.

The fungus survives mainly as dormant mycelium (filamentous fungal threads) on wheat stubble. Airborne conidia germinate in a wide temperature range (5 - 22 °C), optimal infection conditions occur when the humidity is high along with temperatures ranging between 5 and 22 °C.



STEM RUST

Puccinia graminis f.sp tritici

Raised red-brown pustules appear on leaves, leaf sheaths, ears and stems of susceptible cultivars. Individual pustules develop in low disease pressure. Under high disease pressure these pustules coalesce and form a crust-like structure on the plants.

Pustules are oblong and thin and consist of urediniospores which become black and contain teliospores.

Infection occurs under similar conditions to leaf rust, except the ideal temperature for infection is higher (15 - 35 °C) as leaf rust, but only in warmer temperatures (15 - 35 °C).

Wheat which is planted late in the season is more susceptible to infection from stem rust and the disease can develop quickly at temperatures above 20° C.

Sever yield loss can be expected under high levels of infection.



STRIPE RUST

Puccinia striiformis f.sp tritici

Oblong, bright yellow to orange stripes of different lengths appear parallel to the leaf veins. The stripes consist of pustules with spores inside.

Stripe rust is at its most harmful when leaf infection starts before tillering and lasts until the soft dough stage. Early infections will reduce plant height, straw mass, the number of ears, the number of grain per ear and seed mass.

The fungal spores need moisture and low temperatures for germination and infection of the plant. Infection takes place from 2 - 15 °C with the optimal temperature at 11 °C.

Areas with day & night temperatures of less than 15 °C along with regular dew, mist, rain or overhead irrigation is at risk. The fungal spores are distributed by wind.



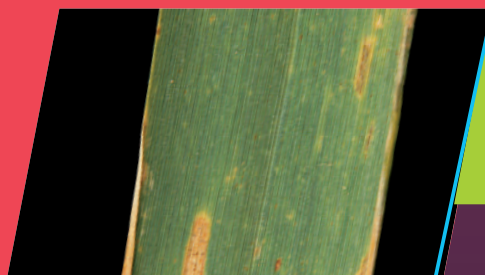
SEPTORIA BLOTCH

Stagonospora nodorum, Septoria nodorum

Septoria blotch can appear on the ears and leaves. When climatic conditions are favourable, light brown lens-shaped blotches form on the leaves. With highly susceptible cultivars, these blotches could become chlorotic and necrotic. This normally appears 2 - 3 weeks prior to ear emergence as conditions are favourable for disease development.

Septoria spp. survives on stubble. The leaves should be wet for 6 - 12 hours with temperatures between 20 - 27 °C before infection happen.

Airborne spores survive on stubble and are released with the first winter rains, which then infects the plant. Secondary infection from rain drops spread the disease throughout the crop. Septoria spp. appears late in the season - from flowering to hard dough stage. Huge losses occur when the flag leaf and two lower leaves are infected.



LEAF BLOTCH

Septoria tritici

Leaf blotches occur, yellow at first but turn grey-brown later. These lesions are parallel to the veins of the leaf. Black spores are clearly visible in the lesions (characteristic for identification).

Yellow blotches appear first on young leaves.

The diagram illustrates the growth stages of a wheat plant, from seed to maturity. Key products and their application points are:

- SEED TREATMENT BEFORE PLANTING:** REDIGO, Gaucho.
- BEFORE PLANTING APPLICATION:** sakura, resolve, PROSARO, Aviator Xpro.
- Product Legend:**
 - Fungicide: PROSARO, Aviator Xpro
 - Insecticide: sakura, resolve
 - Herbicide: REDIGO, Gaucho
 - SeedGrowth: Gaucho

Aviator® Xpro™ in a preventative spray programme helps cereal producers to manage their risk of disease.

The registration owner of Roundup® TURBO is Bayer AG, Germany: Roundup® TURBO Reg. No. L7166. Contains 450 g glyphosate (glycine)/l. Warning.

The following products are trademarks of Bayer AG, Germany: Aviator® Xpro™ Reg. No. L10089. Contains Bixafen (pyrazolecarboxamide) and Prothioconazole (triazole). Warning. Gaucho® FLEXX 600 FS Reg. No. L6562. Contains Imidacloprid (chloro-nicotinyl). Warning. Prosaro® 250 EC Reg. No. L8510. Contains Prothioconazole (triazole) and Tebuconazole (triazole). Warning. Prosper® Trio Reg. No. L9083. Contains Spiroxamine (spiropetalamine), Tebuconazole (triazole) and Triadimenol (triazole). Danger. Redigo® Reg. No. L8616. Contains Prothioconazole (triazole). Warning. Resolve® Reg. No. L8708. Contains Pyrasulfotole (pyrazole), Bromoxynil (nitrile) (heptanoate and octanoate esters) and Mefenpyr-diethyl (Safener). Warning. Sakura® Reg. No. L9082. Contains Pyroxasulfone (pyrazole). Danger. Sivanto Prime® Reg. No. L10776. Contains Flupyradifurone (butenolide). Warning.

All the products are registered under Act 36 of 1947.

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