



Seed- and soil-borne diseases

# *identification guide*

Use this guide to understand  
the importance of the main  
seed- and soil-borne diseases



In the modern age of highly effective single purpose dressings (SPDs) such as Redigo Pro (prothioconazole and tebuconazole), and Raxil Star (prothioconazole, tebuconazole and fluopyram), it can be easy to forget some of the seed- and soil-borne diseases that used to devastate crops. Extreme weather conditions and the sowing of undressed seed have seen a resurgence in some of these diseases, making vigilantly checking and protecting crops all the more important.

## Barley and wheat SPD seed treatment comparisons

			
	Wheat, oats, durum wheat, rye and triticale	Barley	Winter barley only
Bunt (seed-borne)	★★★	N/A	N/A
Bunt (soil-borne)	★★★	N/A	N/A
Leaf stripe	N/A	★★ <sup>1</sup>	★★★
Ergot (reduced germination)	★★★	★★★	★★★ <sup>~</sup>
Microdochium-nivale	★★★	★★★	★★(★)
Loose smut	★★★	★★★	★★★
Seed-borne net blotch	★★★ <sup>~</sup>	★★★ <sup>~</sup>	★★★
Covered smut	N/A	★★★	★★★
Blue mould	★★★ <sup>2</sup>	N/A	N/A

<sup>1</sup> Partial control in winter barley and spring barley. <sup>2</sup> Reduces the effects caused by blue mould on the germinating cereal seeds. <sup>~</sup> Not a label claim, ratings based on trials data and field experience. Note: 3 stars refers to full control and 1 star refers to partial control.

If you'd like to find out more about identifying these diseases there's information on the Bayer website:  
[cropsscience.bayer.co.uk/forgotten-diseases](https://cropsscience.bayer.co.uk/forgotten-diseases)

## Ergot

(*Claviceps purpurea*)

Ergot is known well by many growers, likely due to the risk associated with this disease and grain rejections.

Ergot replaces the grain in spikelets of wheat, barley, oats, rye or triticale with a hard, dark purple sclerotium.

It is the diseased sclerotia themselves that are known as ergots.

Ergots fall to the ground at harvest time, germinating in the spring to give spore producing structures. The spores they produce are released into the air, getting into the open flowers of nearby cereals.



## Microdochium-nivale

As part of the *Fusarium* group of fungi causing seedling blight, *Microdochium nivale* can cause a significant reduction in crop establishment which can lead to a reduction in yield. The disease is most commonly seen in wheat but can infect other cereals too. Infection may be from the soil, but the disease is also seed-borne.

Losses are most pronounced when untreated seed is sown with high levels of infection into poor seedbeds, and with late sown crops. On surviving infected seedlings, the disease splashes up the plant and can cause infection of the ear. Wet weather at flowering can lead to high levels of infected seed.

## Loose Smut (*Ustilago nuda* – wheat f.sp. *tritici*; barley f.sp. *hordei*; oats *U. avenae*)

Loose smut is a monocyclic ear disease (i.e. one infection a year) caused by the fungus *Ustilago nuda* and is most commonly found in barley in the UK. However, loose smut can also infect wheat and oats.

The disease takes hold when air-borne fungal spores from infected plants land on the open flowers of healthy plants infecting the developing embryo. At this stage, infection can only be detected by lab analysis. Once the diseased seeds are sown, the fungus will move into the developing seedlings, and follow the growing point of the plant until it enters the developing grain site. Loose smut is easily recognised at this stage as each grain is replaced by a mass of black fungal spores.

The below diagram explains the lifecycle of loose smut in more detail:



### Loose smut lifecycle

Air-borne fungal spores land on barley, germinate and infect the developing embryo, entering through the open flowers. Newly infected plants show no symptoms.

The thin membrane of the spore-filled kernel breaks, allowing the spores to be dispersed in the wind.

Loose smut fungus invades the seed embryo. At this stage, infection can only be detected by lab analysis.

The fungus remains in the seed embryo until planting, before moving into young seedlings when the seed germinates.

The fungus follows the growing point of the plant until it enters the developing grain sites where it forms masses of spores.



## Bunt/Stinking Smut

(*Tilletia tritici*)

A disease specific to wheat, bunt is well-known for smelling of rotting fish. The disease replaces the grain in infected ears with balls of spores. When these balls are ruptured by the combine, the spores are released as a sooty cloud, contaminating not just the seed in the combine but also the soil, nearby crops and the grain store.

To spot bunt, you need to look for yellow streaks on flag leaves, and stunted plants with dark grey-green ears and slightly open glumes. Cases of bunt are rare, but usually occur when farm saved seed has been repeatedly sown without a single purpose dressing. The disease spreads very quickly as each bunt ball contains millions of spores. As well as contaminating grain, bunt can also contaminate any machinery or equipment it comes into contact with.



## Leaf Stripe

(*Pyrenophora graminea*)

This is one of the most serious seed-borne diseases of barley. Infected seed and poor soil conditions may see the disease kill seedlings as they emerge, but more commonly the disease causes a loss of green leaf area and may even result in there being no harvestable grain at all in infected tillers. It can build up rapidly to cause complete crop loss in repeatedly home-saved seed.

To identify the disease, look for long stripes on leaves that often start out pale green, before becoming yellow and finally turning to brown.



## Covered Smut

(*Ustilago hordei*)

Covered smut primarily occurs in barley. It is usually only found in crops that are grown repeatedly from home-saved, untreated seed.

There are no identifiable symptoms of covered smut until ear emergence. At this time, ears look normal except the grains appear to be covered by a thin membrane. However upon breaking open the membrane it will be apparent that the grains have been replaced by masses of black spores.

These black spores are either released from the membrane and carried by the wind to neighbouring plants, or remain under the membrane, to contaminate surrounding seeds after harvesting. In either case, the spores are then dormant on the exterior of the seed until germination, when they will infect the developing seedling.

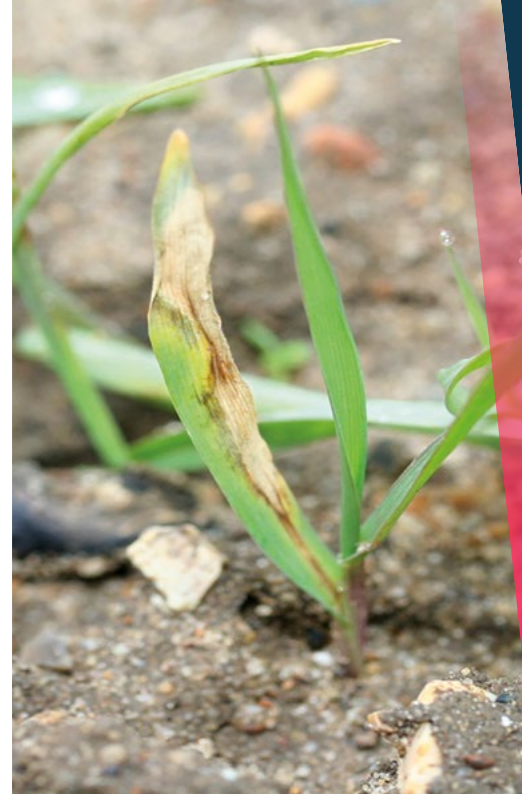


## Seed-borne Net Blotch

(*Pyrenophora teres*)

Seed-borne net blotch only affects barley. With this barley seed-borne disease, the first leaf becomes infected as it emerges. Spores produced from the first leaf then spread the disease to other leaves and to surrounding plants.

Net blotch is often mistaken for leaf stripe, which looks very similar in infected young seedlings. To tell the difference, later leaves infected with net blotch will have short brown blotches, or 'nets', that have a network of random darker lines on the leaves.





## 4 reasons to use Redigo Pro

1. Broadest spectrum disease control with consistently high scores across the major seed- and soil-borne diseases
2. Quality formulation ensures the active moves rapidly through the seedling to control the fungus
3. Excellent crop safety from a tried and trusted product
4. Reduces the initial carry-over inoculum of *Fusarium* spp. and *Microdochium nivale*

////// **Redigo Pro: a tried and trusted partner in a highly changeable market. Why take the risk elsewhere?**

To receive future communications tailored to the seed industry, including advice, support and training materials, go to **[cropscience.bayer.co.uk/seed-signup](https://cropscience.bayer.co.uk/seed-signup)**