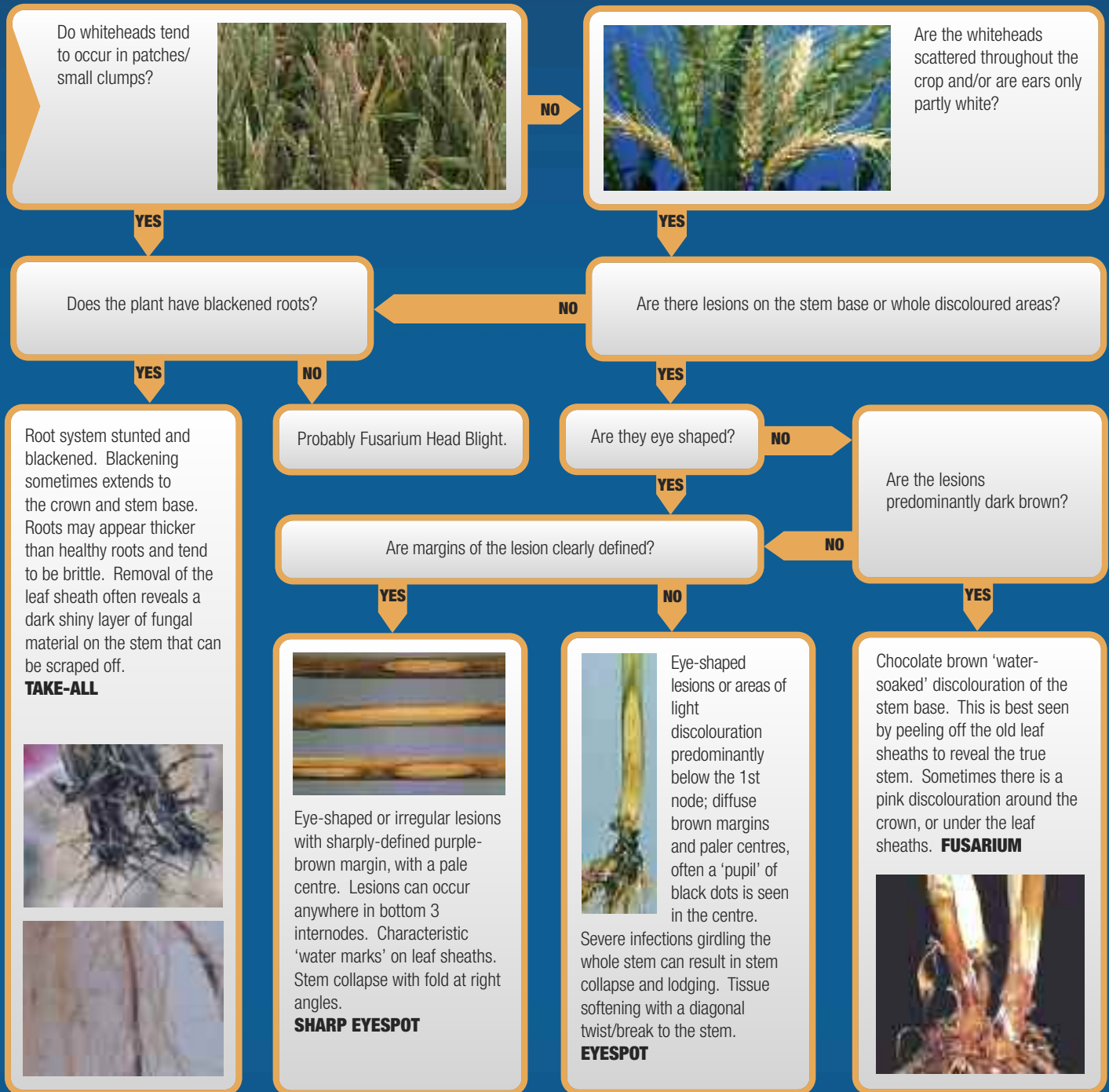


Root and stem base disease identification guide

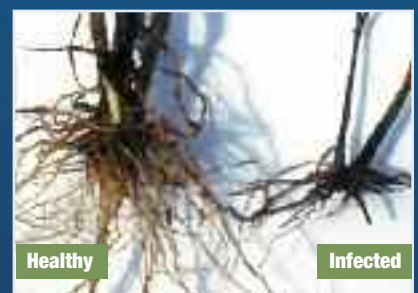


PRACTICAL GUIDANCE

The first indications of take-all infection usually come from inspection of the crop and/or samples of individual plants. Infection of seminal roots can occur immediately after seeds germinate in autumn as emerging roots come into contact with the fungus and may be so severe as to cause seedling blight. However, the first above ground evidence of take-all usually appears later. From GS 31 onwards, patches of stunted plants appear in the crop, often with pronounced leaf yellowing and decreased secondary tiller development. If affected plants are lifted, they will be seen to have blackened roots.

Between flowering and grain-fill, premature ripening of affected plants due to stress may result in "whiteheads", the severity of which tends to be related to climatic conditions during the grain filling period. These may occur in small to extensive patches and may incorporate bare patches in a severely affected crop.

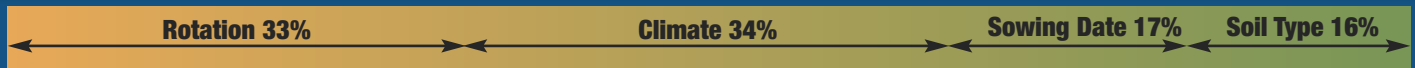
None of the above symptoms is conclusive on its own; the more symptoms that are present, the more certain the diagnosis is take-all. However, whitehead incidence can be attributed to other diseases, especially eyespot, sharp eyespot and fusarium. No conclusion should be taken without visually examining the roots, ideally at flowering but examining the roots throughout the season will give you an indication of disease levels present.



Take-all can significantly reduce on farm yields

Typical yield losses due to take-all in wheat are estimated at 1-2t/ha, although severe infestations may result in losses of up to 50% together with losses in grain quality. Treatment with Latitude can recover up to two thirds of the yield lost to take-all.

Guide to take-all risk assessment - major factors and their relative importance



Rotation - 33% risk The two previous crops should be considered. Both have an influence on the level of take-all in the soil.

Take-all susceptibility	Risk	Previous crop	Second previous crop
Low risk Oilseed rape, Peas, Beans, Linseed, Oats, Triticale, Potatoes ⁺ , Sugar/Fodder Beet ⁺	None	Low risk Low risk	Low risk Medium risk
Moderate risk Non-cropped land*, Grass [^] , Rye	Low	Moderate risk Low risk	Low risk High risk
High risk Wheat, Barley	Medium	Moderate risk Moderate risk High risk	Moderate risk High risk Low risk
	High	High risk High risk	Moderate risk High risk

[^]**Grass:** Ploughed-up permanent grassland can have an effect even further back in the rotation, due to the increase in soil organic matter. Risk may be less after a good clean Rye-grass ley because of the action of fungal antagonists (*Phialophora* spp.)

* **Non-cropped land:** Risk is increased by the amount of cover from cereal volunteers and rhizomatous grasses (e.g. Couch) and a short time interval between destruction of such cover with Roundup or cultivation and drilling.

+ **Roots:** Risk is increased in second wheat crops if conditions at lifting caused damage to soil structure.

Climatic - 34% risk

Region	% Frequency of conditions occurring		
	High risk	Medium risk	Low risk
South West	40	50	10
South East	20	40	40
South Central	10	65	25
East Anglia	15	50	35
West Midlands	5	70	25
East Midlands	10	40	50
West	15	55	30
North	10	30	60
Scotland	10	0	90

Source: Conditions required for take-all development by region 1979-2000. Based on Monsanto FARModel using records of temperature and moisture data.

Sowing Date - 17% of risk

Late Oct/Nov	Low
Mid Oct	Moderate
Early Oct	High
Late Sept	Very High
Mid Sept	Severe

Source: 133 UK Monsanto field trials mainly from second or third wheat crops. First wheat crops after non-cropped land or spring barley will be at risk from early to mid September drilling dates.

pH 6% of risk		
pH	<5.5	High *
	5.5	Lower
	8.5	Higher

* Take-all can be associated with acid patches.

Organic Matter 3% of risk **		
% OM		
<1%		Low Risk
3-6%		Higher
Organic soils**		Severe

**On Organic soils (> 6% OM) the relative importance of soil to overall risk is greater.

Soil - 16% risk

Soil Texture - 7% of risk	
Silt Loam ¹	Lower risk ↓ Higher risk
Clay Loam ²	
Clay ²	
Sandy Loam	
Sandy Clay Loam	
Silty clay ¹	
Sand ³ and Organic ⁴	

Average take-all levels from 415 European field trials with full soil textural analysis. **Note:** Soil textural information must be interpreted with great care.

¹ Some Silty Clay Loams (e.g. Andover series) are low risk, while others (e.g. Bromyard series) are not. Generally take-all can be severe in wet seasons on soils with high silt content (e.g. Fen or Old Red Sandstone).

² For Clays and Clay Loams risk is related to chalk content.

Well-structured Chalky Boulder Clays (e.g. Hanslope series) are relatively low risk soils, poorly structured Clays (e.g. Ragdale series) restrict rooting and favour infection.

³ Very light soils (e.g. Bunter Sandstone) are high risk - except in very dry seasons.

⁴ Black Fen (Peat and Loam Peats) are very high risk due to their open puffy nature.

Other Risk Factors

In addition to the major risk factors above, the following will also increase the risk and likely impact of take-all:

- Less consistent 2nd wheat variety
- Short plough to drilling date
- High seed rates
- Poor weed control in break crops
- Seasons with high inoculum levels identified in soils.
- Loose seedbeds
- Low Nitrogen
- Nitrate forms of Nitrogen
- Low Phosphate
- Low Potassium
- Manganese deficiency



USE PLANT PROTECTION PRODUCTS SAFELY. ALWAYS READ THE LABEL AND PRODUCT INFORMATION BEFORE USE.

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