

# Cereal diseases after drought

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## Key Points

- Often, the year after a drought has average to above average rainfall. Unfortunately, seasons that are good for yield are often conducive to diseases.
- Assess the risk for each paddock, particularly for crown rot and take-all. Also assess the risk of yellow spot and other diseases relevant to your region.
- Select paddocks to minimise disease risk.
- Review crop performance and disease levels in 2006 crops for indications of disease risk.
- If in doubt, use available root disease tests.
- If concerned about levels of wheat disease, consider barley or a broadleaf crop.
- If you choose to grow wheat, identify and implement management strategies to minimise disease risk. Assess the effect of autumn rainfall on disease levels, review sowing time, control grass weeds, consider seed dressings, and select tolerant varieties.
- Consider the implications of this year's decisions for future rotation management and plan how to manage 2007 crops.

## How drought affects plant diseases

Drought reduces the break down of plant residues. This means that some disease inoculum of some diseases does not decrease as quickly as expected, and will carry over for more than one growing season. The expected benefits of crop rotation may not occur.

Bacterial numbers decline in dry soil. Some bacteria are important antagonists of soil borne

fungus diseases. These diseases can be more severe after drought.

Large amounts of seed produced in abandoned crops, or pinched seed from drought stress, will fall to the ground. If there are summer rains, large numbers of summer growing volunteers will provide a green bridge in autumn. Low stock numbers make it more difficult to control these volunteers. These volunteers provide a green bridge for rusts, viruses and virus vectors, and many other pathogens that increase on volunteers.

Other issues that are likely to impact on disease in 2007 are:

- weeds that harbour diseases are harder to kill.
- soil-water and nitrogen may be unbalanced.

## Crown rot

The incidence of crown rot is linked to the amount of inoculum. Yield loss is determined by disease incidence and post-flowering moisture stress. Drought conditions in 2006 (high soil nitrogen levels, low soil moisture levels and grass weed hosts) increased crown rot inoculum. The drought also reduced the decomposition of cereal stubble which harbour the fungus. Therefore, the risk of severe crown rot in 2007 is high. Actual disease levels will depend on seasonal conditions, paddock history, variety, and soil water and nitrogen.

While barley and oats are susceptible to crown rot, they tend to suffer less yield loss than wheat. However, they do contribute to inoculum.

Burning stubble reduces crown rot inoculum above ground, but it rarely reduces disease levels because sufficient inoculum survives below ground. Further, burning reduces soil moisture which often leads to increased plant water stress after flowering, increasing damage from crown rot.

## Rhizoctonia root rot

Rhizoctonia root rot was widespread and severe in 2003 following the 2002 drought. The risk of severe Rhizoctonia is also expected to be high in 2007.

Severe drought reduces the bacteria antagonistic to *Rhizoctonia solani* in the soil. Rhizoctonia recovers faster than the antagonists and can be more damaging. Other factors that favour Rhizoctonia root rot are:

- Late sowing into cold, relatively dry soil
- Minimum cultivation, used by many farmers to get crops in quickly because of the late break



- Lighter soils low in organic matter

No single treatment will control this root rot and it usually requires an integrated approach in those paddocks prone to the disease. Actions to reduce its potential include:

- Greater soil disturbance at sowing (5 cm below sowing depth in red/red brown earths, 10 cm in sandier soil), or cultivation to these depths in the 2 weeks before sowing
- Adequate nutrition
- Avoiding sulfonyleurea herbicides
- Consider seed treatment with ability to reduce Rhizoctonia (if available).

### Take-all

Inoculum levels are likely to be similar to those at the end of the 2005 season. Wet conditions from late winter to mid spring in 2005 meant there were relatively high levels of inoculum leading into 2006.

Dry conditions in 2006 allowed very little build up of take-all during the year but also reduced break-down of infected stubble residues in soil. This means there was relatively little decline in take-all inoculum under break crops such as canola or pulses. Weeds not controlled in 2006 will also be a source of inoculum.

Paddocks at high risk should be sown to a break crop. Consider delaying sowing of paddocks with moderate risk. Consider using a take-all effective seed dressing or an in-furrow fungicide in moderate-risk paddocks where wheat will be sown.

### Yellow spot

Inoculum levels will be low throughout NSW after 2006. There will be only a slight threat from 2005 stubbles that have not broken down. Yellow spot is always a threat with wheat-on-wheat rotations especially if autumn-winter has many long damp periods. Avoid sowing susceptible or very susceptible varieties into paddocks with large quantities of wheat stubble.

### Rusts

The rust threat in 2007 will depend on rain over summer and early autumn. Destocking will make it more difficult to control volunteers by grazing. Concentrate on controlling the volunteers from highly susceptible varieties. Spray out volunteers at least two weeks before planting.

### Wheat streak mosaic

This virus disease was widespread on the Central Tablelands and Central West Slopes in 2006 but its full effect was masked by the drought. Summer and autumn conditions are likely to influence its importance in 2007. New information about this disease will be provided early in 2007.

### Other cereal diseases

Spot form of net blotch was widespread in 2006 on barley, though only at low levels. Avoid sowing barley into barley stubble and use the most resistant variety available. The disease will be present in 2007 and may increase rapidly if warm damp conditions occur.

Inoculum of smuts and bunts will still be present on and in seed following the drought so failure to treat seed this year will run the risk of building up these diseases.

There is a low risk of *Septoria tritici* blotch in wheat and scald in barley. Early sowing and wet weather in winter-spring can increase the risk of infection.

### Beware the 'green bridge'

Summer crops and weeds create a 'green bridge' from one winter crop to the next. This increases the risk of viruses, aphids and rusts increasing in number and infecting emerging winter crops. This is exacerbated in a drought by un-harvested small seed germinating during summer.

If the start of the 2007 season remains dry, aphids, viruses and rusts will not be an issue because numbers will not have an opportunity to build up on volunteers and weeds. If there is a wet summer, monitor aphid numbers and consider using an insecticidal seed treatment.

There have been some changes in pesticide registration and you will need to check with local suppliers as to what is available in 2007 for aphid control.

### Burning stubble to control disease

Burning stubble is not effective in reducing inoculum of some diseases. Diseases that survive at the base of stubble or in the soil may not be killed because temperatures at and below ground level are not hot enough.

### Unknowns

There may be other and unexpected disease problems caused by the drought. Please report any unusual disease development and this will add to our store of knowledge for future management.

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Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (December 2006). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of New South Wales Department of Primary Industries or the user's independent adviser.