

Reducing disease risk

Crop losses due to disease can be significant when growing pulses. The disease risk can be greatly reduced by making some informed management decisions.

Simply by examining the paddock where a pulse crop is to be sown, and by taking care with the selection of seed used for sowing, many potential disease risks can be reduced.

Paddock selection

Selecting the paddock with the lowest disease risk is the first step to maximising yield and profit.

1. Paddock history

Determine the time since the last crop of the same species was planted. Spores of several fungal pathogens can survive in the soil for many years. These include those which cause brown leaf spot and *Pleiochaeta* root rot in lupins, and black spot in field peas. Leave at least four years between the same pulse crop to allow fungal spore numbers to decline.

2. Paddock position

Avoid sowing this year's crop in a paddock adjacent to last year's pulse. Fungal spores can move into adjacent paddocks on infected trash and dust, even if the paddock has never grown a pulse before. Disease pressure can be increased two or three fold simply by poor paddock position.

3. Soil structure

Look at the condition of the soil. Most pulses do not tolerate waterlogging, which can result in poor crop growth and promote infection



Di Carpenter

Figure 1. Lupin taproots are weakened and grow laterally when they meet a hardpan. They are more likely to suffer from waterlogging and are more prone to disease.

from pathogens. A survey of lupin and field pea paddocks carried out by NSW Agriculture found up to half had hardpans. These are compacted soil layers which form just below the zone of cultivation, and are often impenetrable to plant roots and water. If hardpans are present perched watertables can occur during and following periods of heavy rainfall, and promote root diseases.

Hardpans also restrict root growth into the sub-soil. This can result in premature ripening of the crop as plants cannot access soil moisture from lower in the profile.

Hardpans can be identified simply by pushing a spade into the soil—a layer of resistance is felt where a hardpan is present. Alternatively dig up some plants and observe the root growth—regular occurrence of distorted taproots like those in Figure 1 indicate a hardpan. Consult your agronomist to develop a strategy to manage them.



Greg Condon

Figure 2. Sowing pulse crops, such as these faba beans, into stubble reduces the spread of foliar disease, conserves soil moisture and improves soil structure

4. Stubble retention

Cereal stubble should be retained when sowing pulses. Lupins respond favourably to direct sowing into stubble with the cereal straw reducing rain splash of *Pleiochaeta setosa* spores onto plant foliage, significantly reducing brown leaf spot. The crop is protected for as long as the straw persists.

In field peas cereal straw acts as a trellis allowing peas to grow up off the ground reducing disease and soil contamination of the seed sample.

The straw layer helps conserve soil moisture by acting as a mulch for all pulses.

Seed management

High quality sowing seed is the first step towards a successful crop. A few steps can be taken to optimise establishment.

1. Seed testing

Consider testing seed for disease. Cucumber mosaic virus in lupins, ascochyta blight in chickpeas, bacterial blight in field peas and ascochyta in faba beans are all seed borne and should be tested for.

When infected seed is sown it gives rise to infected seedlings that act as a source of infection, often developing into hot spots of disease. Plants infected early often die or produce no seed. However, when late infection occurs, the seed becomes infected.

Growers who have retained seed on farm for a number of years should test their seed for these common diseases.

It is a good idea to have a germination test performed at the same time.

2. Grading seed

While excessive handling of pulse seed is not recommended, grading of seed should be considered. Grading removes small, damaged seeds from the seed lot. These seeds often produce poor seedlings which die from pathogen attack first. The largest seed is selected, producing healthy vigorous seedlings and ensuring optimum establishment. Grading also removes sclerotes (fruiting bodies of the fungus which causes sclerotinia) which would otherwise be sown with the seed.

3. Fungicide seed dressing

Fungicide seed dressing is cheap insurance for good crop establishment. By treating seed with fungicide prior to sowing, seedlings will be protected from a number of fungal pathogens for the first four to six weeks after sowing. Some fungal pathogens may also be present on the seed coat, and by treating seed, levels of inoculum can be reduced.

When seed treatment is used in conjunction with stubble retention, effective control against brown leaf spot in narrow-leafed lupins is almost guaranteed, and blackspot infection in field peas is greatly reduced.

The use of professional seed graders is encouraged when treating chickpeas with fungicide for ascochyta.

Further information

Contact

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Other publications

Chickpea update 1999

Field guide to chickpea disorders in Australia

Field guide to faba bean disorders in Australia

Pulse Point 2 Germination testing

Lupin update 1999

Winter crop variety sowing guide 1999

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The information contained in this publication is based on knowledge and understanding at the time of writing in May 1999. 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 Agriculture or the user's independent adviser.

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