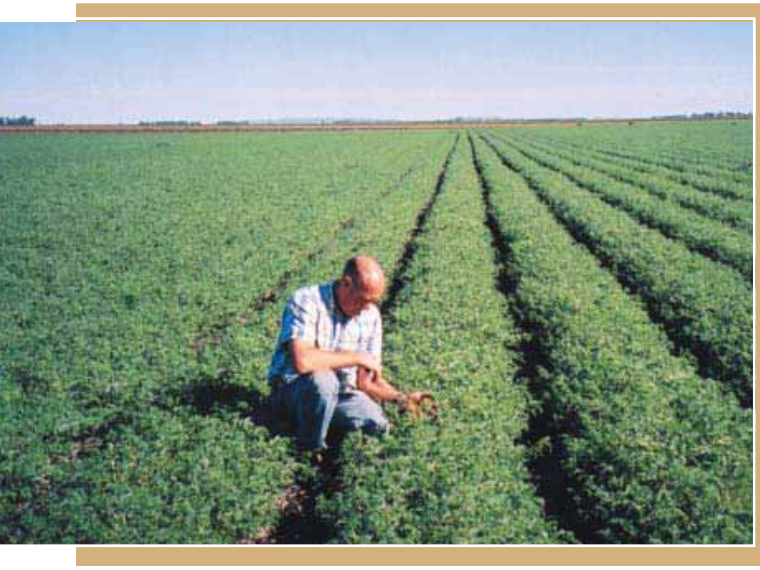
CHICKPEA 2004
Queensland and New South Wales



Chickpea yields in 2003 were highly variable from one paddock to the next, and often reflected the impact of extreme climatic conditions that typified this season.

- **Frosts during winter and spring had a major impact on both vegetative growth and pod set**
- **Colder than normal temperatures in early spring delayed the onset of effective podding by as much as 10 days in many crops**
- **Extreme heatwave conditions in Sept and terminal moisture stress caused many crops to finish early.**

These climatic extremes had a significant impact on yields, especially where there were only low levels of stored soil water at planting or where there were subsoil constraints.

While many eastern districts were exposed to high levels of Ascochyta infection, the majority of the crop (over 75%) was produced in the western areas where there were only isolated reports of Ascochyta. This fact is often overlooked in the efforts and publicity that go into managing ascochyta in the infected areas.

Despite the variable and difficult season, there were still many excellent chickpea crops where gross margins were similar or superior to cereals. These crops are testament to the effectiveness of the chickpea management strategies adopted by growers and also to the fact that diseases were not a major issue for the majority of growers in 2003.

The rotational benefits of chickpeas were again obvious last year, with wheat yields increased by up to 1 tonne per hectare. This is consistent with experiences in previous years and with research data.

The information provided in this Chickpea 2004 update should to be used in conjunction with the previous management information outlined in Chickpea 2003.

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WHY WAS ASCOCHYTA SO BAD IN SOME EASTERN AREAS IN 2003?

Ascochyta was present to epidemic proportions in many of the more intensive cropping areas in 2003, even though the disease was virtually undetectable during the previous 2002 season. Ascochyta inoculum appears to have built-up to extremely high levels on both undecomposed chickpea stubble and on volunteer chickpea plants that were not controlled during the wet autumn period. Any 2003 chickpea crops that were sown within a 2 km radius of these infection sources were subsequently exposed to extremely high levels of Ascochyta inoculum as the chickpea seedlings emerged from the soil.

Important lessons learnt from the experiences of 2003 include:

- **Don't base your assessment of Ascochyta risk this coming season solely on the basis of whether the disease was detectable in the previous seasons chickpea crop.**
- **Inoculum levels can explode to extremely high levels on volunteer chickpeas and undecomposed stubble over the summer-autumn months.**
- **Chickpeas planted within a 2km radius of these inoculum sources can be subjected to extremely high levels of initial infection.**

On a reassuring note, it was encouraging to know that the mancozeb strategy will hold-up in an epidemic situation, even where nearly all plants have been infected at the seedling stage. While there were often major differences in the level of control from paddock to paddock in areas of high infection, this can usually be attributed to the effectiveness of the spray application techniques. In areas where there are high levels of inoculum loading, there appears to be **very little margin for error in either application equipment or timing of the fungicide sprays. The timing of the first and second mancozeb sprays is absolutely critical in preventing the disease from building-up in the crop.**

Queensland Government
Department of Primary Industries

NSW Agriculture

PULSE AUSTRALIA

BALANCE

YOUR ASCOCHYTA RISK IN 2004

The northern GRDC region has three levels of ascochyta risk. The key to achieving cost-effective management of this disease is to honestly assess the risk level for each paddock and then manage accordingly.

LOW RISK SITUATIONS

The only region that can genuinely be considered LOW RISK is Central Queensland (Central Highlands and the Dawson-Callide). Ascochyta has not been detected in Central Queensland and the management strategy for this region is based on not bringing in planting seed (and ascochyta infection) from outside the CQ area.

All planting seed should be sourced from within this region and treated with a suitable fungicide. Always check the origin of your planting seed prior to delivery.

Chickpeas grown in all other areas can be classified as either Moderate or High Ascochyta risk. This assessment should be done on a paddock-to-paddock basis and not on a regional basis, as their definitely are some high-risk situations in the more western areas given the right seasonal conditions for Ascochyta.

MODERATE RISK SITUATIONS

This applies to situations where the following two criteria have been met

- Chickpeas are being planted at least two km away from inoculum sources such as 2003 (and 2002) chickpea stubble paddocks, volunteers and spring trap crops
- Seed has been sourced from crops where Ascochyta has not previously been detected and has been treated with a suitable fungicide.

The majority of crops grown in the western areas often meet these criteria i.e. west of the Darling Downs in Qld and west of the Newell highway in NSW.

Do not use the disease status of your previous chickpea crop/s as the main criteria in assessing Ascochyta risk. We know this fails if you have favourable conditions for the build-up of disease on stubble or volunteers over summer-autumn.

The main emphasis on Ascochyta management in these moderate risk situations is based around the use of clean, treated seed and paddock isolation from inoculum sources.

Crop management for Moderate Risk situations

- Select seed from crops where Ascochyta had not been detected and treat with a registered fungicide.
- Plant within the recommended planting window
- The first fungicide spray should ideally be applied prior to the first rainfall event after crop emergence. Alternatively, apply before the 3-branch stage of crop development (usually 2-3 weeks after emergence). Use mancozeb at the rate of 1 kg/ha with the recommended application set up (page 3).
- Intensively monitor the crop for any disease development
- Only apply a second mancozeb spray if significant rainfall events are forecast within 14-28 days of the first fungicide spray.
- Continue to monitor the crop and if ascochyta is detected, revert to the HIGH RISK MANAGEMENT strategy.

ASSESSING ASCOCHYTA RISK IN 2004

- **CQ REGION** → **1. LOW RISK**
- **ALL OTHER REGIONS**
  - **2. MODERATE RISK**
    - Over 2km separation from previous chickpea stubble or volunteers
    - Disease not detected in previous seed crop
  - **3. HIGH RISK**
    - Within 2 km of chickpea stubble or volunteers
    - Or disease present in previous seed crop

(Lionel Coxen - NRM QLD)

HIGH RISK SITUATIONS

Disease epidemics can rapidly develop in situations where chickpeas are being grown within a 2 km radius of previous chickpea stubble paddocks. For this to occur you need a combination of

- High levels of Ascochyta inoculum, either as diseased crop residue or due to the build-up of inoculum on volunteer plants or chickpea stubble (wet summer autumn).
- Wet conditions conducive to disease infection and spread during winter.

Most of the more intensively farmed areas such as the Darling Downs and east of the Newell highway in NSW are in this category by the very nature of the farming system.

A significant number of crops in the western areas are potentially in this category if they are planted within 2 km of 2003 chickpea stubble.

The key to effective Ascochyta management in these high-risk situations is based around the timely and efficient use of fungicides. Growers in this risk category are advised to

- Only proceed if you are fully committed to the fungicide spray strategy.
- Are prepared to set-up spray equipment specifically for fungicide application.
- Have access to an Accredited chickpea agronomist.
- Avoid low yield situations (low soil water or subsoil constraints).

In crop management for High Risk situations

- Preferably seed from crops where Ascochyta was not detected. All seed to be treated with a registered fungicide.
- Plant within the recommended planting window and avoid early plantings, which can encourage disease development.
- The first fungicide spray should ideally be applied prior to the first rainfall event after crop emergence. Alternatively, apply before the 3-branch stage of crop development (usually 2-3 weeks after emergence). Use mancozeb or chlorothalonil at the lower of the recommended rates using the recommended application set-up on page 3.
- Apply a second fungicide spray two weeks after the first.
- Monitor the crop to determine levels of ascochyta and apply subsequent sprays on a needs basis prior to rain events or on a 14-18 day interval if you are experiencing heavy dews.
- Consider the use of chlorothalonil if there is a risk of infection spreading onto pods.

APPLICATION OF FUNGICIDES

Mancozeb and chlorothalonil are protectant fungicides that work by forming a protective coating over the surface of the plant that then prevents any further infection.

TIMING OF THE SPRAY and EFFECTIVE APPLICATION are absolutely critical if fungicides are to work as intended.

Poor application techniques have resulted in many cases of poor control of Ascochyta in the past. Using ground-rigs set-up for herbicide application and hoping the wrong set up will be OK, or increasing fungicide rate to compensate for an inadequate application method usually prove ineffective.

The timing of applications is covered in the Moderate and High Risk management strategies on pages 2 and 3.

Commercial experience suggests that early morning application onto a plant that is already wet from dew can provide improved coverage and better overall disease control.

RECOMMENDED APPLICATION TECHNIQUE

GROUND APPLICATION using a boom spray set up with the combination of the correct nozzle type, operating pressure and water volume. (For fungicides and insecticides to be effective good coverage is essential.)

Nozzle Selection and Operation: To be effective, fungicides rely on smaller droplets than those normally recommended for herbicides. To achieve this select a flat fan nozzle that will produce a fine/extra fine sized droplet and deliver an equivalent of 80 L water/hectare at the desired speed (refer to Table 1). At higher travel speeds you may need to use two smaller nozzles on a double swivel or a Teejet Twinjet* to produce the flow rate required, but in the fine/extra fine droplet spectrum.

Table 1 *Guide to Nozzle Selection for Protectant Fungicides, operated at 4 bar pressure (400 kpa)*

Speed	Preferred Nozzle Options	Anticipated Water Application	
		Broad Acre (full double overlap)	1 metre row crop (50cm band 1 nozzle)
10 km/hr	• Teejet XR 110015 or • Hardi F-015-110	82 L/Ha	41 L/Ha
15 km/hr	• Teejet TJ60 - 11002 vs or • 2 x Teejet XR 110-01 • 2 x Hardi F-015-110	76 L/Ha	38 L/Ha
20 km/hr	• Teejet TJ60 - 11003 vs or • 2 x Teejet XR 110-01 • 2 x Hardi F-015-110	82 L/Ha	41 L/Ha

The above nozzles are examples. For specific nozzle information to suit individual needs, consult the nozzle manufacturers catalogues.

Water Volume: Aim for 80 L/ha and preferably 100 L/ha. In heavy or dry crops the more the better.

Water pH should not exceed pH 7 for optimum results. High pH water should be buffered back.

Additives: Growers should avoid experimenting with surfactants and follow label instructions when using fungicides. While "stickers" may improve rain fastness, this is often at the expense of leaf coverage. Stickers can reduce droplet spread over the leaf surface and redistribution following dews.

NOT RECOMMENDED

The use of hollow cone nozzles, as used for fungicide application in horticulture, is not recommended.

Their higher percentage of fine droplets can mean greater evaporation, drift losses and lack of penetration into the canopy at the lower broadacre water rates. Trials in broadacre crops have shown that 11001 flat fan nozzles have consistently given double the leaf coverage compared to hollow cone nozzles.

Nozzles used for most herbicide applications have mainly medium and large droplet sizes to reduce the risk of drift. These nozzles are also unsuitable for fungicide (and insecticide) application due to there reduced leaf coverage.

SPRAYING IN WINDY CONDITIONS

The nozzle set-up recommended on page 3 will not be effective in situations where the fungicide application needs to proceed under windy conditions (where wind speeds exceed 20 km/hour). This is because the very fine droplets generated by these nozzles are susceptible to drift.

If it is critical that the fungicide application needs to proceed due to impending rain, the best option under windy conditions will be to select a nozzle with a larger droplet size (110-02 or 110-03) that will be less affected by drift, and to increase water volumes to 120 L/ha in an effort to improve coverage.

AERIAL APPLICATION

Aircraft specifically set-up to apply fungicides proved to be very effective in controlling Ascochyta in 2003,with some growers opting for aerial application throughout the season. The value of timely application through aircraft was highlighted last year when wet weather delayed the application of the first and second ground-rig applications and allowed Ascochyta to get away on many growers in areas like the Darling Downs.

The aircraft should be set up with a fine droplet setting, VMD 150 - 180, with a minimum of 30 L water /ha, but preferably 40 L. Wind speeds can be as high as 15 km/hour with a Delta T of 8 or less.

As coverage is so important, only use aerial contractors that have had their spray patterns tested.

USING A CONTRACTOR (Ground and Aerial)

Growers and agronomists should fully discuss the application requirements prior to spraying, and insist on them, rather than assume the job will be done as recommended. It may cost a little more per hectare, but inadequate application technique can result in poor control which will eventually be significantly more expensive.

Acknowledgements

Bill Gordon, Consultant, Millmerran Qld

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GRDC Grains Research & Development Corporation

Further information:

Chickpea 2003 - Management Strategies for the Northern Region - M.Lucy et al.

Grower Guide to Deep Planting of Chicpeas - M.Lucy et al.

Strategies for the control of foliar diseases in chickpeas - 2001 K.Moore et al.

Selecting, Testing and Handling Chickpea Seed/Testing Chickpea Seed with fungicides®, (2004). Pulse Australia/DPI

QueenslandCrop Management Notes - 2004 (CD versions0

NSW Agriculture Winter Crop Sowing Guide - 2004 F.J. McRae

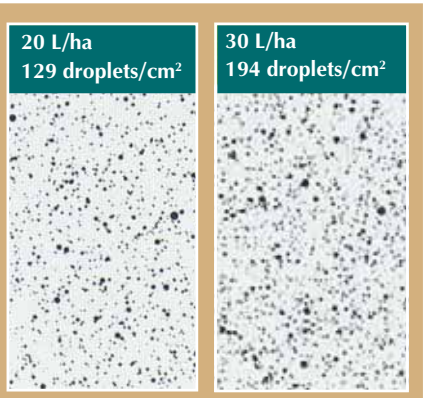
Chickpea Harvest and Seed Storage - M.Lucy et al

Pulse Update Annual 2004 - Pulse Australia

Irrigated Chickpea Management (2002) - M.Lucy & J.Slatter

Growers Guide to Deep Sowing (2003) - Cons. Farmers Inc, DPI, Pulse Aust.

Using water-sensitive paper is a very quick and effective means of assessing actual in-field spray coverage - especially if you are considering spraying under less than ideal conditions.



The ideal droplet spectrum should be the range of 120-200 droplets/cm²

BALANCE Update

Balance® is a new Group F herbicide that has been used commercially since 2001. Chickpea growers throughout Australia have been impressed with the wide spectrum of weed control that has been achieved by Balance alone or in a tank mix with simazine.

To ensure crop safety with Balance (along with other soil-applied herbicides), a number of management practices should be followed to ensure that there is adequate separation of the seed from the herbicide layer. Depth of planting, removal of deep planting furrows and careful use of disc-opener planters are management options available for the safe use of soil applied herbicides, including Balance.

Ongoing field research in 2003 was directed to situations where higher levels of visual crop effect may occur. The results in 2003 reinforced that although in some situations Balance crop effects may be present, no significant differences in yield were recorded. Trial work carried out by NSW Agriculture also highlighted that rain immediately after application increased visual effects but that good safety margins were seen for current commercial varieties such as Amethyst, Jimbour and Howzat. Increased sensitivity was however clearly seen in a number of experimental varieties of chickpeas. This emphasizes the need for all new varieties to be tested with all the herbicides currently registered for weed control in chickpeas to determine if there are any varietal sensitivities before commercialisation.

Additional trial work is ongoing into the plant back periods for summer crops and winter crops. Bayer CropScience will continue to define these over the coming seasons.

Further technical information can be obtained from the contacts below:

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Richard Daniel Ph: 0428 657 782 (NSW/Qld)

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The information contained in this pulication is based on knowledge and understanding at the time of writing 15/01/04. 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 with the appropriate officer of NSW Agriculture/Queensland Department of Primary Industries or the user's independent advisor.