

# ***Recovery After the Drought - Reducing the Risks***

## **GUIDELINES ON CROP-RELATED ISSUES**

TECHNICAL INFORMATION PROVIDED BY  
GRAINS INDUSTRY  
RESEARCHERS AND TECHNICAL ADVISERS  
*COORDINATED AND DISTRIBUTED BY GRDC*

*Contributing research organisations include:*

**NSW Agriculture**

**DPI Victoria**

**SARDI**

**CRC Weed Management**

**CSIRO**

**Birchip Cropping Group**

with valuable assistance from industry consultants

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The following information is a summary of the presentations and discussions delivered during a GRDC coordinated "Recovery After the Drought" cropping workshop in Melbourne on 13 January 2003.

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# AFTER THE DROUGHT CONSIDERATIONS FOR 2003

## DISEASE

### Cereal Crops

"2002 was not a reliable disease break year."

#### Take-all

Inoculum levels are likely to be similar to those at the end of the 2001 season.

Wet conditions in 2001 meant there were relatively high levels of inoculum leading into 2002 in many areas of South Australia, Victoria and southern New South Wales.

Dry conditions in 2002 allowed very little build up of take-all during the year but also reduced break-down of infected residues in soil so there was relatively little decline in take-all inoculum under break crops such as canola or pulses.

Paddocks with potential for high take-all after 2001 should be soil tested for the disease by the Root Disease Testing Service in summer 2003.

Paddocks at high risk should be sown to a break crop or late-sown to barley in 2003.

Consider delayed sowing of paddocks with moderate risk.

Consider using Jockey® seed dressing or Impact-in-furrow® in moderate-risk paddocks where wheat will be sown.

#### Crown rot

Moisture stress during 2002 meant there was a large increase in crown rot inoculum throughout large areas of South Australia, Victoria and southern New South Wales.

Crown rot inoculum will persist longer than take-all and could be a serious problem for 2004 as well as 2003.

The threat of crown rot in 2003 and 2004 will depend on seasonal conditions in those years.

Barley is susceptible but tolerant to crown rot so it can be a source of infection.

Be wary of growing durums in 2003-4 in paddocks sown to cereals in 2002.

Burning may not be a sufficient control measure for crown rot.

#### CCN

Inoculum levels were building up under susceptible varieties and weeds in South Australia and Victoria before 2002.

Be wary of paddocks at high risk after 2001.

The dry conditions in 2002 would have allowed only a small increase in CCN under most susceptible crops but could have made 2002 a poor break year.

Ensure that resistant and moderately tolerant varieties are sown as appropriate in the rotation.

Use the Root Disease Testing Service to check CCN levels if planning to sow a susceptible variety.

### **Yellow leaf spot**

Inoculum levels will be low throughout south eastern Australia after 2002.

There will be only a slight threat from 2001 stubbles that have not broken down.

Yellow leaf 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 stubbles.

### **Other diseases**

Rusts are always a threat. A drought year is no guarantee of safety.

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.

Spot form net blotch was widespread in 2002 on barley in South Australia and Victoria, though only at low levels. The disease will be present in 2003 and may increase rapidly if warm damp conditions occur.

Drought years should not be seen as presenting opportunities to grow very susceptible varieties.

The years following drought are frequently wet, creating conditions in which inoculum levels can rise dramatically. Stripe rust was very severe in wheat in 1983 following the drought of 1982.

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.

## **Canola**

**"Resowing failed canola crops in 2003 could result in serious disease management issues and is not a recommended option."**

### **Blackleg**

Canola sown into a failed canola crop would be at high risk of blackleg.

Blackleg levels were found to be very high in many crops throughout southern NSW in 2002, including crops that failed at bud formation/flowering.

If sowing canola into canola is the only option available, take all management precautions possible:

- Be aware of potential herbicide carryover from last year.
- Check for blackleg on remaining stubble including pieces beneath the soil. Dead tissue can be infected with blackleg. Current resistances occur in living plant tissue.
- Choose a variety with a high blackleg resistance rating (7 or above).
- Recent research on spore production from canola stubble has shown even 100kg/ha of stubble will produce moderate numbers of spores. (There is typically more than 1,200kg/ha of canola stubble present after the following cereal crop has been sown).
- Use a fungicide with a fertiliser.
- Be aware that this is a high risk option.
- Do not consider canola-on-canola in paddocks with more than 100kg/ha of stubble.

### **Sclerotinia**

The risk from sclerotinia remains unchanged for 2003.

Petal infestation in southern NSW during early flowering in 2002 was extremely low, with only the Wallendbeen area recording high petal infestation levels.

No sclerotinia stem rot was recorded at the end of 2002.

## ***Pulse***

**"Sowing pulses on pulses increases the risk of crop failure in seasons favourable for disease development."**

Drought conditions throughout the Mallee and Wimmera last year (2002) resulted in poor growth in most pulse crops, with many crops failing. It is very tempting to re-sow paddocks to the same crop or another pulse in 2003. However, there are several disease management issues growers should be aware of before deciding to replant on pulses.

- Many of the common diseases of pulse crops can survive quite well in dry years. Old stubble residues can harbour many foliar diseases such as:
  - the ascochyta diseases of chickpea, lentil, field pea and faba bean, and
  - botrytis diseases such as grey mould of lentil and chickpea, and chocolate spot of faba bean.
- Several common diseases can also survive in the soil in the absence of stubble residue, these include:
  - Phoma stem blight, this can infect both field pea and chickpea
  - Downy mildew of field pea

- Botrytis fabae, which causes chocolate spot in faba bean and grey mould in lentil
- Sclerotinia
- Root rot pathogens such as Phytophthora and Pythium can also survive under dry conditions but are strongly dependent on soil moisture to become active. Generally these pathogens are always present in the soil at low levels and cause damage to plants under very wet conditions.

Sowing a pulse crop on a failed pulse could expose the new crop to high or potentially high levels of inoculum. The basis of crop rotation to manage disease is to allow inoculum levels to decrease in a paddock using non-host crops before sowing with another pulse crop, generally this period is two or three years. The risk of high disease pressure in the following pulse crop will be largely dependent on the pulse crop sown, the prevailing weather conditions (generally the more moisture present, the higher the disease risk) and inoculum level.

However, looking at the possible disease threats, and making some simple judgements can reduce the risk of crop losses. The following Table presents the most important diseases for each pulse crop and the threat each disease can pose to the following pulse crop.

2002 Pulse Crop	2003 Pulse Crop			
	Field pea	Lentil	Faba bean	Chickpea
Field pea	Ascochyta (Blackspot) <b>XXXX</b> Sclerotinia <b>XX</b> Downy mildew <b>XXX</b> Powdery mildew <b>XXX</b>	Phoma <b>XX</b> Sclerotinia <b>XX</b>	Ascochyta blight <b>XX</b>	Sclerotinia <b>X</b>
Lentil	Phoma <b>XX</b> Sclerotinia <b>XX</b>	Ascochyta <b>XXXX</b> Grey Mould <b>XXXX</b> Sclerotinia <b>XX</b>	Chocolate spot <b>XXX</b> Sclerotinia <b>X</b>	Botrytis grey mould <b>XXX</b> Sclerotinia <b>XX</b>
Faba bean	Mycosphaerella pinodes <b>XX</b> Sclerotinia <b>XX</b>	Grey Mould <b>XXXX</b> Sclerotinia <b>XX</b>	Ascochyta <b>XXXX</b> Chocolate spot <b>XXXX</b> Sclerotinia <b>X</b>	Sclerotinia <b>X</b>
Chickpea	Sclerotinia <b>XX</b> Phoma <b>XX</b>	Grey mould <b>XXX</b> Sclerotinia <b>XX</b>	Sclerotinia <b>X</b>	Ascochyta blight <b>XXXX</b> Grey mould <b>XXX</b> Sclerotinia <b>XX</b> Phoma <b>XXX</b>

The number of crosses (**XX**) indicates the risk of crop damage, eg **XXXX** high, **X** low

#### Disease

#### Pathogens

Ascochyta blight	Ascochyta rabiei (chickpeas),
Ascochyta (Blackspot)	Ascochyta pisi (field peas), Phoma medicaginis, & Mycosphaerella pinodes
Ascochyta	Ascochyta lentis (lentil)
Ascochyta	Ascochyta fabae (faba bean)
Grey Mould	Botrytis cinerea & Botrytis fabae
Chocolate spot	Botrytis fabae
Phoma	Phoma medicaginis
Sclerotinia	Sclerotinia sclerotiorum

## Recommendations

To avoid damage by disease in the following pulse crop the following points are recommended :

1. Do not sow the same pulse crop species in the same paddock. From the Table above it is seen that the disease risks are too high. Even if the season has been dry, sufficient levels of inoculum can survive and quickly reproduce early in the season to cause problems. Select pulse crops that pose the lowest disease risk.
2. Use a fungicide seed dressing. This will protect from early infection by root rot pathogens and allow healthy seedling establishment.
3. Where possible, either graze or burn stubble residue before cropping. This should be done late in the season so as not to leave the paddock in a bare state over summer. Removal of stubble residue prior to sowing will reduce inoculum levels for the following pulse crop.
4. Be aware of self-sown plants that could emerge in the following pulse crop. Dun type field peas have a degree of hard seed and lentils are often a problem due to the large numbers of small seed. Self-sown plants can act as a source of inoculum in the following pulse crop. These plants can also contaminate seed if allowed to grow through to maturity. Growers should be aware of the difficulty of grading out some pulse seeds and possible downgrading of seed due to contamination.
5. Do not be tempted into letting self-sown plants establish as a substitute crop, this represents a high disease risk situation. Plants often emerge early and in large numbers creating a perfect environment for disease establishment and most likely the crop will fail by the end of winter due to high disease pressure.

2002 Crop	Best ← 2003 Crop Option → Worst			
<b>Field Pea</b>	Faba bean	Lentil	Chickpea	Field Pea
<b>Faba Bean</b>	Chickpea	Field Pea	Lentil	Faba bean
<b>Chickpea</b>	Field Pea	Faba bean	Lentil	Chickpea
<b>Lentil</b>	Field Pea	Chickpea	Faba bean	Lentil

# **INSECTS**

## **Diamondback moth**

Diamondback moth levels were exceptionally high for the first time in 2002 due to unseasonal conditions

High summer rainfall supported the growth of volunteer canola plants and weed growth, providing a “green bridge” for the moths to survive on until moving onto canola.

Above-average winter temperatures then allowed the population to multiply.

The risk for diamondback moth in 2003 depends on how the season unfolds.

## **Aphids and viruses**

If the start of the 2003 season remains dry aphids and viruses will not be an issue because aphid numbers will not have an opportunity to build up on volunteers and weeds.

If conditions become wet during the summer, monitor and control aphids found in the crop.

Products registered for aphid control include Endosulphan and Thiodan, plus Aphidex and Pirimor for Green Peach Aphid and Cabbage Aphid.

# **NUTRITION**

**"The need for nutrient inputs will vary from paddock to paddock and the capacity to supply the required fertilisers will differ from farm to farm."**

Some farms have bigger financial buffers following a good year in 2001. Others have had low returns for several years in a row.

The amount of late summer and autumn rainfall (or stored water) will also impact on input decisions.

The following are guidelines on likely nutrient dynamics following a drought. Wherever possible growers should seek independent advice.

## **Nitrogen**

Paddock N status is commonly underestimated following a drought.

There is likely to be some carry-over of fertiliser N from 2002 crops into the 2003 growing season.

Expect increased mineralisation following break of the drought, but the impact of this on subsequent N supply will depend on when substantial rainfall occurs. Mineralisation will be greater with good autumn rains than after winter rainfall because of warmer soil temperatures in autumn.

N decisions for the 2003 crop should be based on deep soil N tests, particularly if aiming for malting barley.

Do an N budget as normal.

Growers should consider spreading risk by minimising N inputs at sowing and topdressing in response to how the 2003 growing season develops.

## **Phosphorus**

There is likely to be some carry-over of fertiliser P from 2002 crops into the 2003 growing season.

Use some P at sowing, but consider reducing rates provided there is a reasonable history of applied P over the past five years and a Colwell soil test indicates more than 15ppm P.

Growers should seek specific advice but general rules-of-thumb suggest:

- apply half the normal P rate following failed crops (crops with little growth yielding less than 0.5 t/ha)
- use two thirds the normal rate following drought crops yielding more than 0.5 t/ha
- normal rate of P on fallow paddocks.

These reduced P rates apply to cereals, canola and most pulse crops except faba bean, which tends to be more sensitive to P supply than other species.

## **Zinc and Sulphur**

On paddocks with good Zn and S history there may be no need to apply these nutrients in 2003.

## **Other nutrients**

Apply as normal.

# **WEEDS AND HERBICIDE ISSUES**

"Effective weed management strategies are expensive in the short-term, but over the long-term are economic because of the high future cost of uncontrolled higher weed densities."

"Residual herbicides used in 2001 and 2002 can have a large impact on susceptible crops in 2003."

**NB: Weed management options in the wake of the drought will vary according to soils and cropping systems. Key issues include:**

- impact of dry conditions on potential herbicide carryover
- impact of rotation changes on weed management.

## ***New weed incursions***

- Very high probability of importation of new weed species into a district in contaminated grain or forage.
- Preventing a new weed incursion is much cheaper than managing it later.
- Incursions of species such as parthenium weed, musk weed, blue mustard, bedstraw, amsinkia, Chilean needle grass, wild radish, hairy panic, etc have already occurred. High-risk species, such as bedstraw, will establish in areas of NSW.
- Weeds are likely to be moved along roadsides by/in travelling stock (eg in faeces, on wool) and from grain spills and hay.
- Check grain or forage for weed seed contamination.
- Get weed seed identified.

- Growers need to ask vendors about the source of the seed.
- Feed stock in a restricted area and keep record of location.
- Check for emergence of new weed species after the first significant rain and afterwards.
- Keep records of new incursions and establish a management strategy.
- Seek more training on weed identification.

## ***Herbicide carryover***

Carryover management advice on individual product labels is the starting point.

A comprehensive list of herbicides with which carry-over is an issue follows this. Additional product-specific information is available from herbicide companies.

Plant back periods for sensitive species are generally specified in weeks or months after application. These plant back periods are strongly influenced by:

- the species to be planted
- the rate of herbicide applied
- soil pH
- soil type
- solubility of the herbicide
- cumulative rainfall following application
- soil moisture
- soil temperature.

In drought times, the most variable factor is rainfall.

## ***Influence of soil moisture***

The chemical and biological processes that degrade herbicide residues in soil are highly dependent on soil temperature and moisture levels. These processes begin when soil moisture exceeds wilting point and increase in activity as soil temperatures rise.

Last season's dry conditions mean residues of chemicals applied during 2002 may persist into the 2003 season.

For example, where soil pH is less than 6.5, field peas can be sown 12 months after spraying Logran<sup>®</sup> providing the cumulative rainfall total is more than 300mm. Less rainfall extends the plant back period. In many areas rainfall totals since 2002 applications have been much less than 300mm.

Summer rain often has a very short-term effect due to high evaporation; something that must be taken into account when calculating rainfall totals in the context of residues; particularly if falls are isolated events.

### **Options for 2003**

Rainfall between now and sowing time in 2003 will influence decision making. If conditions remain dry over autumn and cumulative rainfall totals are still an issue when sowing moisture is available consider the following options:

- Choose a species or variety suited to later sowing to allow more time for residues to degrade. Field peas are suited to much later sowing than lupins. Barley is more suited to delayed planting than wheat.
- If there are residues of herbicides such as the triazines in the top few centimetres of soil a combination of delayed sowing and more tolerant species sown more deeply with narrow points can help the roots avoid the residues. This approach can be quite effective if the surface soil remains dry and roots are forced to grow below the residues.
- Choose crop species or varieties that are unaffected by the particular herbicide. For example, if Glean<sup>®</sup> was used in '02, wheat would be a safe option in '03. If Spinnaker<sup>®</sup> was used in '02, IT canola would be an option in '03.

### **Paddock strip test for residues**

If time is available, use the seeder to sow a test strip of a sensitive species across the paddock.

Paddock test strips are more reliable and less trouble than pot tests. The limitation is that nothing will grow until after it rains, unless a strip

can be irrigated, so paddock tests could lead to sowing delays.

### **Weeds guide to residues**

Herbicide residues will often lead to damage on weeds and/or volunteer plants so examining weeds for injury symptoms is a valid test for residues.

After it rains, carefully inspect weeds for any apparent herbicide injury symptoms. If newly emerging weeds are still being affected close to sowing time there may be a problem!

Be aware that if the herbicides have leached deeper into the soil it will take time for the roots to pick the herbicide up.

### **Pot tests for residues**

It is possible to carry out pot tests to confirm a residue problem by placing soil from the paddock into pots and sowing sensitive plants in them.

This can be carried out well before sowing but sampling errors can lead to misleading results and good soil sampling procedure is essential if the tests are to mean anything!

A procedure for pot tests for soil residues is included in an excellent set of notes entitled "Residual herbicide carryover management in 2003" that is available from the Syngenta technical advice line (1800 067 108).

Effective pot testing requires:

- a large number of sub-samples of soil taken across a representative area of the paddock.
- good management of the pots with particular attention on the moisture regime. Over-watering can lead to accelerated residue breakdown.

## **Important**

**Pot tests are best used to confirm a problem. Sampling errors and the possibility of herbicides leaching deeper than sampling depth, mean a "no apparent effect" result may be unreliable.**

**Table 2. Plantback Guidelines for Crop Rotation**

Residual herbicides-Ally®, Broadstrike®, Flame®, Glean®, Lusta®, Harmony® M, Logran®, Midas®, Monza®, OnDuty®, Raptor® and Spinnaker® have special recommendations for recropping needing consideration when planning rotations. Recommendations are:

**Minimum Recropping Interval-After Application**

Product	Ally® Associate®	Glean® a Lusta®			Harmony® M	Logran® Nugran®			Spinnaker®	Broadstrike®	Flame®	Monza®		Raptor®	OnDuty®	Midas®
	5.6 - 8.5	6.5 or less	6.6 - 7.5	7.6 - 8.5		6.5 or less	6.6 - 7.5	7.6 or over	All soils			6.5 or less d	6.6-8.5 m			
barley	6 w	9 mo	9 mo	18 mo	9 mo	12 mo	12 mo	12 mo	10 mo e	3 mo	4 mo f	12 mo	22 mo	10 mo i	8 mo i	8 mo i
canola	9 mo	12 mo	22 mo	-	9 mo	12 mo	22 mo h	24 mo	34 mo	9 mo p	36 mo	10 mo	22 mo	21 mo	34 mo	34 mo
canola-Clearfield	-	-	-	-	-	-	-	-	0 mo	-	-	-	-	-	0 mo	0 mo
cereal rye	6 w	3 mo	3 mo	18 mo	3 mo	12 mo	12 mo	12 mo	-	0 mo	-	-	10 mo	-	-	-
chickpea	9 mo	-	-	-	9 mo	12 mo	22 mo h	24 mo	0 mo	3 mo	4 mo	10 mo	22 mo	10 mo	0 mo	0 mo
cotton	-	-	-	-	-	-	-	-	-	3 mo r	24 mo	-	-	-	34 mo	-
fababean	9 mo	12 mo	22 mo	-	9 mo	12 mo	22 mo	24 mo	0 mo	9 mo p	3 mo	12 mo	22 mo	10 mo	0 mo	0 mo
field pea	9 mo	12 mo	22 mo	-	9 mo	12 mo	22 mo	24 mo	0 mo	3 mo	-	10 mo	22 mo	0 mo	0 mo	0 mo
Jap millet	14 mo	-	-	-	4 mo b	24 mo	24 mo	24 mo	-	-	36 mo	-	-	21 mo	-	-
lentils	-	-	-	-	-	-	-	-	-	-	-	10 mo	22 mo	-	-	-
linseed	9 mo	12 mo	22 mo	-	9 mo	12 mo	22 mo	24 mo	-	-	36 mo	-	-	21 mo	34 mo	34 mo
lucerne	9 mo	12 mo	22 mo	-	9 mo	12 mo	22 mo	24 mo	10 mo	3 mo	4 mo f	-	-	10 mo	8 mo	8 mo
lupin	9 mo	12 mo	22 mo	-	9 mo	12 mo	22 mo	24 mo	10 mo	9 mo p	-	10 mo	-	10 mo	8 mo	8 mo
maize	14 mo	18 mo	26 mo	-	6 mo b	24 mo g	24 mo k	24 mo	See label	0 mo	10 mo	-	-	21 mo	-	-
medics	9 mo	12 mo	22 mo	-	9 mo	12 mo	22 mo	24 mo	10 mo	0 mo	36 mo	10 mo	22 mo	10 mo	8 mo	8 mo
mungbean	-	-	-	-	4 mo b	24 mo	24 mo	24 mo	0 mo	-	3 mo	-	-	21 mo	-	-
oats	9 mo	6 mo	9 mo	18 mo	9 mo	12 mo	12 mo	12 mo	22 mo	3 mo	36 mo	10 mo	22 mo	21 mo	8 mo	8 mo
panorama millet	14 mo	-	-	-	14 mo	24 mo	24 mo	24 mo	-	-	36 mo	-	-	21 mo	-	-
safflower	9 mo	12 mo	22 mo	-	9 mo	24 mo	24 mo	24 mo	22 mo	-	36 mo	-	-	21 mo	22 mo	22 mo
sorghum	14 mo	18 mo	26 mo	-	4 mo b	24 mo g	24 mo k	24 mo	-	3 mo p r	10 mo	-	-	21 mo	34 mo	34 mo
soybean	14 mo	18 mo	26 mo	-	4 mo b	24 mo g	24 mo k	24 mo	0 mo	0 mo	-	-	-	21 mo	-	-
sub. clover	9 mo	12 mo	22 mo	-	9 mo	12 mo	22 mo	24 mo	10 mo	3 mo	-	10 mo	22 mo	10 mo	8 mo	8 mo
sunflower	14 mo	18 mo	26 mo	-	4 mo b	24 mo	24 mo	24 mo	-	3 mo pr	24 mo	-	-	21 mo	-	-
triticale	6 w	0 mo	0 mo	0 mo	3 mo	12 mo	12 mo	12 mo	10 mo e	0 mo	-	0 mo	0 mo	10 mo i	8 mo i	8 mo i
vetch	-	-	-	-	-	-	-	-	10 mo	-	-	-	22 mo	10 mo	8 mo	8 mo
wheat	10 d	0 mo	0 mo	0 mo	3 mo	0 mo	0 mo	0 mo	10 mo e	0 mo	4 mo f	0 mo	0 mo	10 mo i	8 mo i	8 mo i
wheat-Clearfield	-	-	-	-	-	-	-	-	0 mo	-	0 mo	-	-	-	0 mo	0 mo
white French millet	14 mo	-	-	-	14 mo	24 mo	24 mo	24 mo	-	-	-	-	-	21 mo	-	-

**Notes:**

- a Glean® and Siege® are not recommended for use on soils of pH 8.6 and above.
- b Longer interval needed in soils with pH above 7.8, with Harmony® M.
- c No less than 400 mm of rainfall between Harmony® M application and sowing of rotation crop.
- d For Monza 300mm rainfall (min) required between application and sowing of plantback crop.
- e If intending to sow wheat (except Clearfield wheat), barley or triticale during the next winter season do not apply Spinnaker® later than the end of June and post-emergence later than the end of July. Do not use Spinnaker® where rainfall from spraying to sowing of cereals is expected to be below 300 mm. In addition do not use the 0.3 L/ha rate in areas where rainfall from spraying to sowing of cereals is expected to be below 400 mm.
- f Where wheat(except Clearfield wheat) and barley or lucerne are to be planted during the next winter season DO NOT apply FLAME later than the end of DECEMBER, and only when rainfall is expected to be greater than 200mm between herbicide application and sowing.
- g Replanting interval can be reduced to 15 months with 700 mm rainfall between application and planting.
- h Replanting interval can be reduced to 15 months where a minimum of 700 mm rainfall falls between herbicide application and planting.
- i Where wheat ,barley or triticale are intended to be sown during the next winter season do not apply Raptor, OnDuty or Midas later than the end of August. Minimum rainfall from Raptor application to sowing of cereals is 200mm. Minimum rainfall from OnDuty and Midas application to sowing of cereals is 250 mm.
- k Replanting interval can be reduced to 15 months with 900 mm rainfall between application and planting.
- m For Monza 600mm rainfall (min) required between application and sowing of plantback crop.
- n Where Logran® is applied at 10 to 15 g/ha plus 1 L of trifluralin/ha, the following crops can be applied from 9 months after application provided 300 mm of rainfall have been recorded: fieldpeas, canola, chickpeas, medics, clover, lucerne, safflower, lupins, cereal rye, barley, oats, wheat and triticale.

- p On shallow soils of less than 30 cm depth, DO NOT plant until 2 years after application.
  - r 3 mo on deep well drained soil.
  - No information d = days w = weeks mo = months.
- All pH's are measured in water 1:5

Avoid using any of these herbicides more than once in any paddock within 12 months.

**Other Products:**

**Eclipse®:** Do not plant susceptible crops such as canola or any brassica crop, field peas, beans, medics, lucerne or sub-clover for 9 months after application.

**Tordon® 75-D:** Do not plant susceptible broadleaf crops such as soybean, grain legumes, pasture legumes and oilseeds within 12 months of applying herbicide. Cereal crops and grasses are normally unaffected.

**Lontrel®:** Residues in straw of treated crops can affect subsequent susceptible crops. Crops such as chickpeas, faba beans, fieldpeas, lentils, lupins, lucerne, medics, safflower, sub-clover and white clover should not be planted for 9 months when up to 0.3 L/ha has been applied; for 12 months where between 0.3-0.5 L/ha has been applied. Where 0.5 L/ha has been used fieldpeas should not be planted for 2 years.

**Atrazine® - plantback periods:** all sensitive crops for six months where rates up to 2.5 L/ha have been used and eighteen months where higher rates used.

**Simazine® - plantback periods:** nine months for all sensitive crops where rates up to 4.5 L/ha have been used.

# ROTATIONS

## Wheat after wheat

- Check for take-all, crown rot. Assess the risk of yellow leaf spot, cereal cyst nematode and other diseases.
- Look at crop performance and disease levels in 2001 crops for guidance.
- If concerned about levels of disease consider barley or a broadleaved crop.
- Have a root disease test done if in doubt.
- Identify and implement management strategies to minimise disease risk if you choose to grow wheat. Assess the effect of autumn rainfall on disease levels, review sowing time, control grass weeds, consider seed dressings, select tolerant varieties.
- Consider the implications of this year's decisions for future rotation management and plan how to manage 2004 crops.

## Barley after barley

- Spot form of net blotch and CCN are the main risks.
- Consider burning or ploughing in stubble to reduce inoculum levels.
- Check on the effectiveness and economics of available fungicides, especially in lower-yielding environments.
- Fungicide effectiveness depends on the right timing.
- The variety sown in 2001 is also a risk assessment factor.

## Canola after canola

- Identify when the 2002 crop failed – early or after flowering – because this has implications for disease and nutrition carry-over.
- Canola-on-canola is a high-risk option but may be acceptable for 2003 where a herbicide factor is limiting options for non-canola crops provided:
  - the 2002 crop failed early
  - you can sow a variety with high blackleg resistance
  - you use all available precautions including seed dressing.
- **Do not re-plant canola unless all three criteria can be achieved.**

## Lentils after lentils

- Assess what disease was present in 2002 crop, especially ascochyta and botrytis.
- Disease can be managed with fungicides if necessary but cost is an issue.

# ADDITIONAL ISSUES

## Keep some balance in the crop program

- Planting 100% wheat may set you up for problems including:
  - future rotation and what to plant in 2004
  - huge market and production risks.
- Aim to sow 25% of the area cropped in 2003 to non-cereal or break crops because:
- pulses and canola prices may be firm if there are large areas of cereals
- it will enable rotation in future years to assist with sustainability and management of diseases and weeds.

## To capture the “good year”:

- Consider seeding rates. There is generally no penalty from high seeding rates and higher densities provide higher yield potentials.
- Sow good seed that will produce high-vigour seedlings. Have a germination test done close to sowing, especially for pulses.
- Monitor foliar diseases. Winter and spring are wet be ready with fungicides if needed.
- Monitor nitrogen levels and prepare to top dress to allow the crop to reach maximum yield.
- Control weeds early.

## If 2003 is average or below average:

- Assess the season on the basis of the strength and timing of the break.
- Monitor moisture levels in the soil profile ahead of sowing and consider changing crop type depending on available moisture.
- Retain flexibility with sowing times and crop and variety selection and be prepared to change direction as the season unfolds, especially if the break is late.



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