



Foliar diseases of faba beans

Management in southern NSW

Agronomic management is the key to minimising the incidence and severity of foliar diseases in faba beans. This includes the integration of: • paddock selection • control of volunteers • variety selection • sowing time • use of clean seed • strategic use of fungicides.

The key points

- **Fungicides are preventative** - spray before disease is evident.
- **Timing of fungicide application is critical** - spray before rain.
- **Effective application** is critical for successful prevention .
- **Good leaf coverage** is essential.
- Aim to apply **lots of fine droplets**.
- Have **fungicide on hand** so application can be made as soon as the decision to spray is made.

Managing foliar disease in faba beans is all about reducing the risk of infection.



Strategic Spray Program

The recommended program involves strategic applications of mancozeb and carbendazim in a preventative spray program as outlined below.

1. An application of mancozeb four to six weeks after crop emergence targeting ascochyta (leaf blight) and chocolate spot.

Ascochyta is transferred from one season to the next on the seed, on volunteer plants or in infected trash. The first spray is aimed at preventing early crop infection and reducing the likelihood of ascochyta development later in the season. It also reduces the build up of chocolate spot and the need for more frequent fungicide applications later in the season.

2. Strategic application of mancozeb and/or carbendazim through the growing season for chocolate spot control.

Thorough and regular crop monitoring is essential if the strategic spray program is to be successful. The timing of fungicide applications depends on the disease level observed, the time since the previous application, and the likelihood of rainfall and other conditions conducive to infection and spread of chocolate spot. Use the *Fungicide application decision guide* in this brochure to help make the spray decision.

Carbendazim is best used when high chocolate spot pressure occurs or when rapid plant growth produces large amounts of unprotected foliage, particularly from mid-flowering onwards.

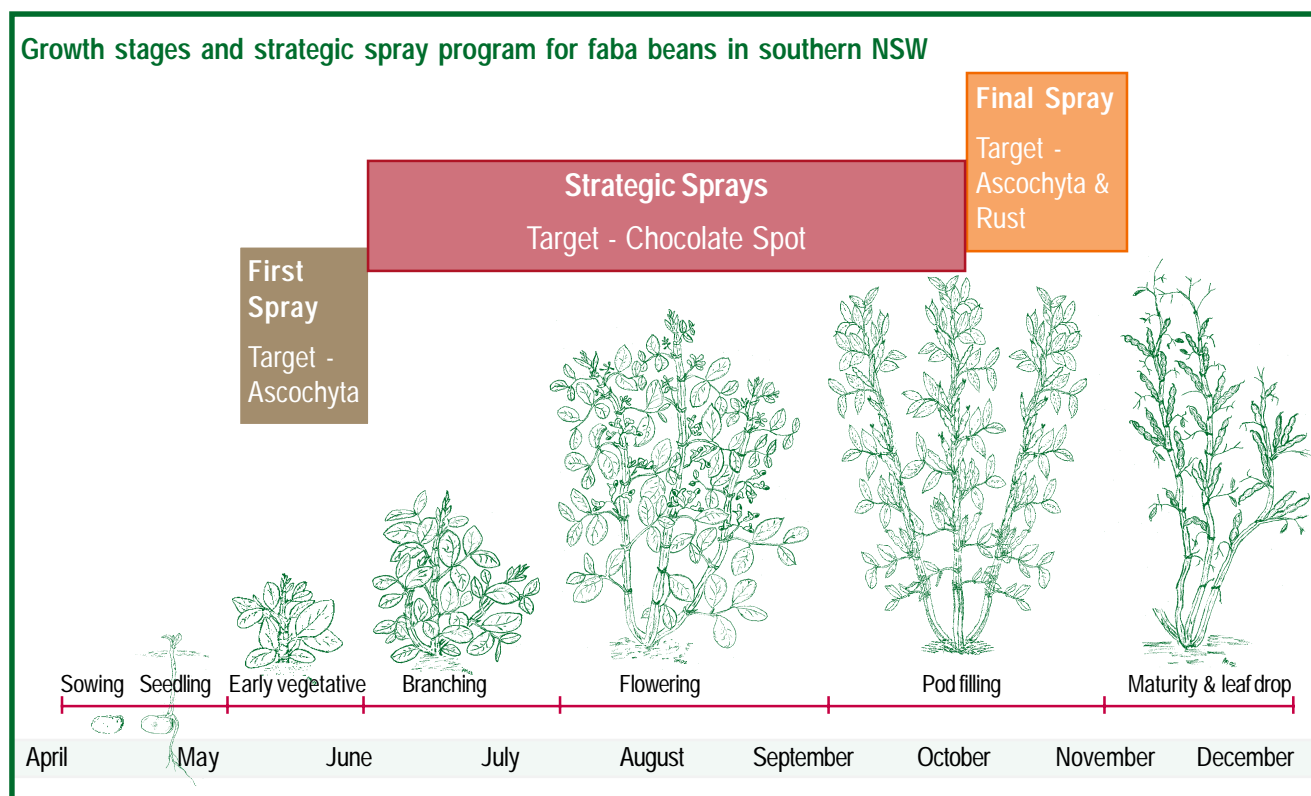
The number of fungicide applications in the season will be determined by a combination of disease levels in the crop and the number of infection periods. An infection period occurs following rain. Growers should use as many weather forecasting tools as possible to predict the likelihood of rainfall.

3. Final application of mancozeb targeting rust and ascochyta.

The final application of the season should be mancozeb to control rust which is often seen late in the season in southern NSW. This application will also control ascochyta, reducing the likelihood of infections on the pod and seed. This minimises blemishes on the seed and the carry-over of ascochyta.

Special considerations

- Use mancozeb earlier if rust or ascochyta become a problem as carbendazim is only registered for control of chocolate spot.
- Mancozeb may need to be used throughout the season on varieties that are susceptible to ascochyta because it has the best activity against ascochyta. This is particularly important when producing product for whole seed markets as ascochyta staining will cause downgrading.
- Chlorothalonil can be substituted for carbendazim, however growers must be aware of the grazing withholding—**do not graze treated crop residues**.



Ascochyta blight *Ascochyta fabae*

- Also referred to as leaf blight.
- Begins as small grey-brown spots which are visible on both sides of the leaf.
- Lesions can be on the leaf, stem or pod. Stem lesions can cause stem to break.
- Lesions spread with internal rings and have ascomata (spherical fruiting bodies) in the centre. The centre will eventually drop out.
- Can cause significant yield losses and seed quality downgrading shown in seed on right.



A single ascochyta lesion. Note the concentric rings which are formed as the lesion spreads. Black ascomata are found in the centre, which eventually falls out of the lesion.



Ascochyta lesions on the pod can go through to the seed causing severe discolouration.

Chocolate spot *Botrytis fabae*

- Begins as small grey-brown spots visible on only one side of leaf.
- Lesions spread in a random manner and can cover the whole leaf, or be on the stem or pod.
- The disease can cause total plant defoliation and flower and pod abortion depending on severity.
- Severe disease levels can cause significant yield losses and seed quality downgrading.
- Can occur in autumn on early sown crops.
- A major problem in spring when the crop is actively growing. Chocolate spot is very aggressive and spreads rapidly in warm, humid conditions.



Chocolate spot. Left - small, pinpoint grey lesions. Centre - larger, more developed lesions. Right - aggressive phase of infection - lesions spread rapidly to cover the whole leaf.

Rust *Uromyces viciae-fabae*

- Rusty red pustules on leaf surrounded by a light yellow halo.
- Can defoliate plant in advanced stages.
- Pustules may also form on pods.
- Rust is rarely seen in southern NSW until very late in the season when it causes little damage. It is controlled by mancozeb fungicide and is therefore not a serious problem.



Rust showing yellow halos around the pustules



A leaf showing rust pustules

Other leaf damage

- **Insect damage**—red legged earth mites initially cause the leaf to go silver, then large areas of the leaf go red-brown. Lucerne flea chew holes right through the leaf.
- **Physical damage** (e.g. wheel tracks).
- **Herbicides** can leave marks on the leaf due to overlap, higher than label rate use, or simply a reaction to some grass herbicides.



Advanced red legged earth mite damage



Early red legged earth mite damage



Lucerne flea damage

Application of fungicides

Effective timing and application of fungicide is critical for disease control. Incorrect timing and application have resulted in many cases of poor control of foliar disease in the past.

Effective application

Ground application involves the use of a boom spray set up with the combination of the correct nozzle type, operating pressure and water volume. For protective fungicides to be effective good coverage is essential.

Aerial application may be necessary as crop height can limit boom travel and effectiveness. Keep this in mind when selecting paddocks for faba beans. A paddock with power lines and a large number of trees can result in large areas of crop being unsprayed. these areas can act as a source of inoculum for the rest of the crop.

Timing

For protective fungicides to be effective it is essential that they be applied prior to rain. Disease spread can be rapid during and immediately after rain. Remember new growth is not protected. Monitor the crop regularly and thoroughly and be prepared for repeat applications after 14 days.

Water volume and quality

For ground application aim for at least 80 L water per ha, and preferably 100 L/ha. If the label or permit specifies a minimum water rate, you must apply the fungicide at the specified water rate. In bulky or dry crops high volumes are preferable. For aerial application apply in a minimum of 30 L water, preferably onto a canopy wet by a morning dew. This can dramatically increase the effective water volume which improves fungicide coverage.

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

Nozzle selection and operation

To be effective fungicides should be applied as smaller droplets than those normally recommended for herbicides. Nozzles used for most herbicide applications produce mainly medium and large droplet sizes and are unsuitable for fungicide application.

To achieve smaller droplets and good canopy penetration select a flat fan nozzle that will produce fine droplets when operated on at least 4 bar (400 kPa) pressure (see table below as a guide).

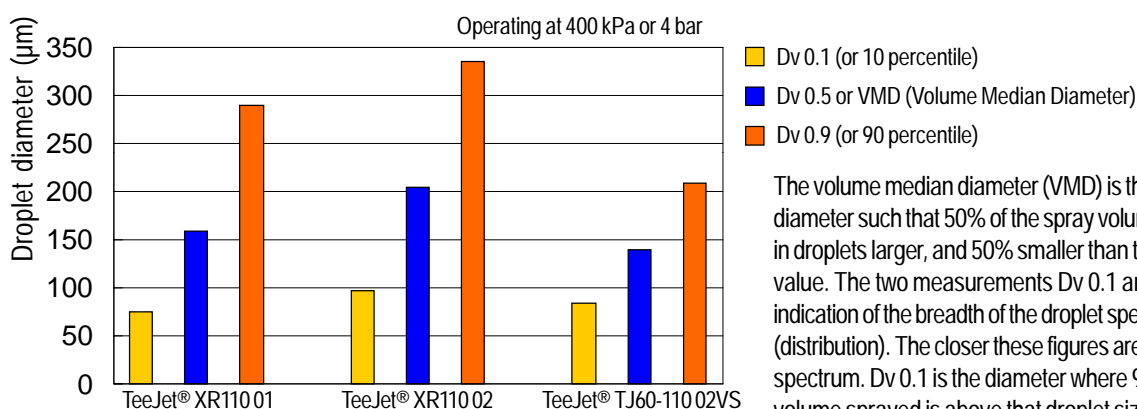
Adjust ground speed so that you can deliver at least 80 L/ha water or label/permit specified minimum water rate. If growers need to operate at higher speed then the alternative is to use two smaller nozzles operating on a double swivel or a spraying systems Twinjet.

Guide to nozzle selection for protectant fungicides operated at 4 bar (400 kPa) pressure, broad acre with full double overlap.

Speed	Selected nozzle	Anticipated water application
8 km/hr	Teejet XR 110 015	102 L/ha
	Hardi F110 015	104 L/ha
10 km/hr	Teejet XR 110 015	82 L/ha
	Hardi F110 015	83 L/ha
10 km/hr	Teejet TJ60-110 02VS	109 L/ha
	2x Teejet XR110 01	108 L/ha
	2x Hardi F110 01	110 L/ha

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

Hollow cone nozzles (as used in horticulture) provide a high percentage of very fine droplets. At the lower water rates used for broad acre application, penetration of the canopy is poor and the higher percentage of very fine droplets can mean greater evaporation and drift losses. They are not recommended.



The volume median diameter (VMD) is the droplet diameter such that 50% of the spray volume is contained in droplets larger, and 50% smaller than the stated VMD value. The two measurements Dv 0.1 and Dv 0.9 give an indication of the breadth of the droplet spectrum (distribution). The closer these figures are, the tighter the spectrum. Dv 0.1 is the diameter where 90% of the volume sprayed is above that droplet size (µm) and Dv 0.9 is the size where 90% of the volume is below.

Data courtesy TeeJet Australasia Pty Ltd

Droplet diameter spectrum of commonly used spray nozzles.



Fungicide coverage of mancozeb. Many of the very small droplets are too small to be seen with the naked eye.

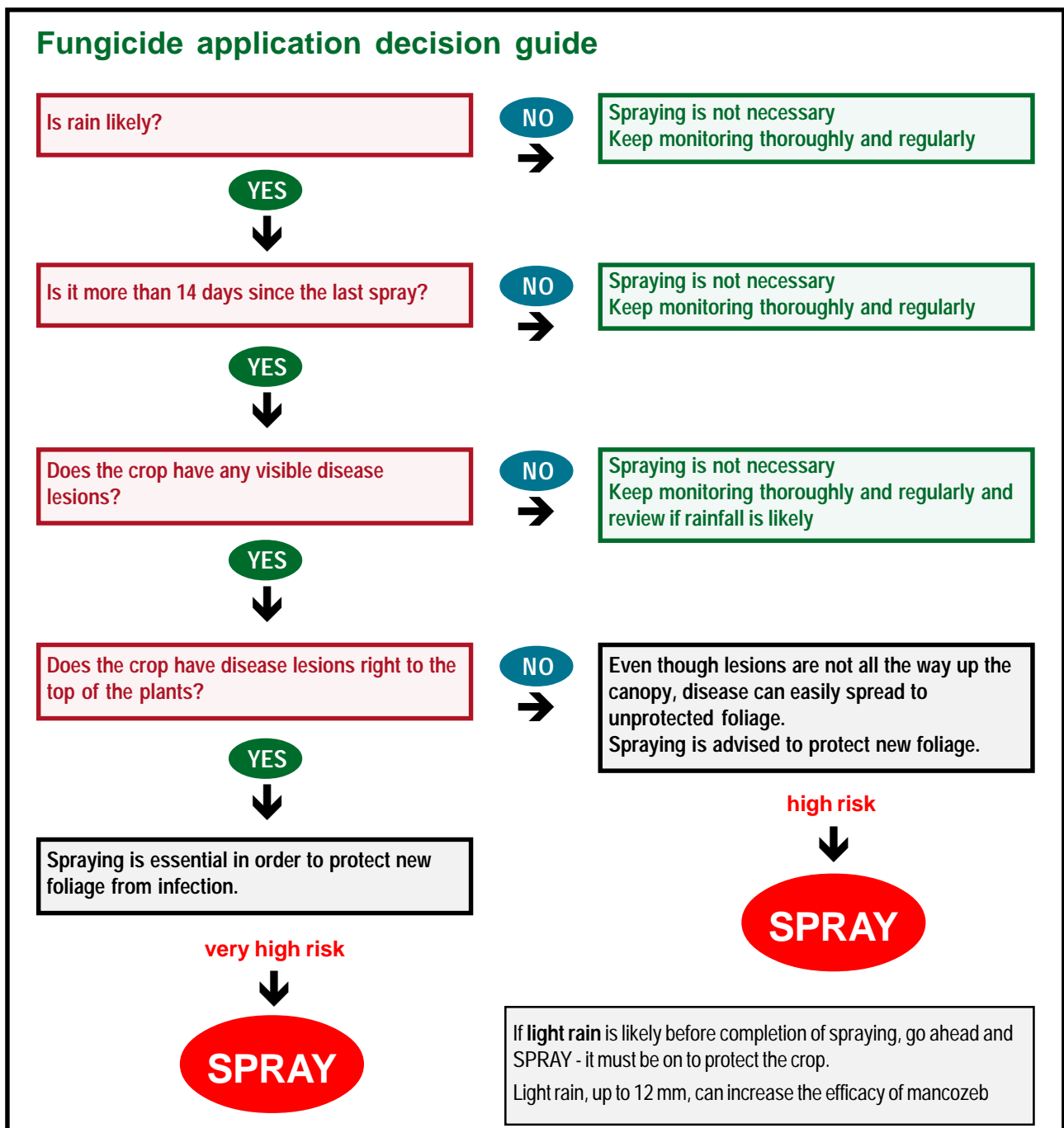
Monitoring - what to look for!

Check at least 10 plants across a minimum of 9 locations and look at the whole plant. Use information provided on the previous page or seek advice on disease identification.

Record:

- presence of disease - number of plants with lesions
- level of disease - proportion of canopy with lesions

Determine the need to spray from the *Fungicide application decision guide* below



The fungicides

The five fungicides mancozeb, carbendazim, chlorothalonil, copper and procymidone are either registered or used under permit. **All are protectants only** and as such are effective only in preventing new infection. They have no curative effect on existing infections. Newly grown, untreated foliage is not protected.

Mancozeb

- The best activity against ascochyta blight (leaf blight) - should be the first and last spray.
- Not systemic - only provides surface protection for up to 14 days.
- Mancozeb is generally cheaper per hectare and can be applied more regularly for the same overall cost which may suit your risk management program.

Carbendazim

- Effective **only** against **chocolate spot**.
- Limited movement in the plant.
- Observed to have a longer protective period than mancozeb. However, any new untreated foliage is not protected against disease.
- Carbendazim is best used during mid-flowering when growth is rapid and conditions conducive to chocolate spot development are likely.

Chlorothalonil

- Targeted at chocolate spot prevention so is best used during mid-flowering.
- Limited movement in the plant.
- Has been observed to have a longer protective period than mancozeb.

Procymidone

- Effective against chocolate spot.

Copper

- Effective against chocolate spot and rust.

Foliar fungicides					
Active Ingredient	Concentration	Diseases controlled or suppressed	Rate	Withholding Period	Critical comments
Mancozeb	420 g/L	Chocolate spot	3.5 L/ha	Harvest: 30 days	Do not graze livestock on treated crops, or crop trash
Mancozeb	750 g/kg	Chocolate spot, Leaf blight (<i>Ascochyta fabae</i>) Rust	1.7-2.5 kg/ha 1.7-2.2 kg/ha	Harvest: 7 days	
Carbendazim	500 g/kg 500 g/L	Chocolate spot and <i>Botrytis</i> spp (Permit PER5406 expires 31/3/2004)	500 g/ha 500 ml/ha	Harvest 30 days Graze or cut for stockfeed: 30 days	Apply a maximum of 2 consecutive applications at 14 day intervals. Apply in a minimum 100L water per ha
Chlorothalonil	720 g/L	Chocolate spot and Rust	1.4 - 2.3 L/ha	Harvest: 7 days	Use the higher rate if the crop is dense and disease pressure is high. Do not graze livestock on treated crops.
Procymidone	500 g/L	Chocolate spot	0.5 L/ha	Harvest: Nil	Ground application in 100 L water per ha.
Copper	190 g/L 500 g/kg	Chocolate spot and Rust Chocolate spot and Rust	4.6 L/ha 2.2-2.5 kg/ha	Harvest: 1 day	Ground application in 250 L water per ha.
Note: Additional formulations of active ingredients may be available. Please check current pesticide registrations.					



Litmus paper can be used to assess spray coverage throughout the canopy

Further information contact

Peter Matthews,
NSW Agriculture, Temora Ph. 02 6977 3333
Di Carpenter,
NSW Agriculture, Wagga Wagga
Ph. 02 6938 1980

DISCLAIMER

The information contained in this publication is based on knowledge and understanding at the time of writing in July 2002. 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.

ALWAYS READ THE LABEL

Users of agricultural chemical products must always read the label and any Permit, before using the product, and strictly comply with the directions on the label and the conditions of any Permit. Users are not absolved from compliance with the directions on the label or the conditions of the Permit by reason of any statement made or omitted to be made in this publication.

Some of the chemical use patterns quoted in this publication are approved under Permits issued by the National Registration Authority (NRA) and in force at the time the publication was prepared. Persons wishing to use a chemical in a manner approved under Permit should obtain a copy of the relevant Permit from the NRA and must read all the details, conditions and limitations relevant to that Permit, and must comply with the details, conditions and limitations prior to use.

Text by Peter Matthews
District Agronomist,
NSW Agriculture, Temora,
and
Di Carpenter
Pulse Development Officer,
NSW Agriculture,
Wagga Wagga.

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GRDC



NSW Agriculture

IMPORTANT NOTICE

TO USERS OF PROCYMIDONE PRODUCTS

New label instructions are now in force for using procymidone products - restricting instructions for use.

All products supplied by retailers must bear new instructions which incorporate these changes. If you have product in your possession which you purchased before 19 November 2004, then it will be necessary to obtain a copy of the new instructions for the product. Copies of instructions can be obtained from your local reseller of procymidone products.

FROM 15 NOVEMBER 2004 USE OF PROCYMIDONE PRODUCTS MUST BE IN ACCORDANCE WITH THE NEW INSTRUCTIONS. ALL PREVIOUS LABELS HAVE BEEN SUSPENDED.

INSTRUCTIONS FOR SUPPLY AND USE OF SUSPENDED PRODUCT

Signal Heading (S7)

**DANGEROUS POISON
KEEP OUT OF REACH OF CHILDREN
READ SAFETY DIRECTIONS BEFORE
OPENING OR USING**

These instructions apply to the use of procymidone products during the period of suspension.

Product may be supplied only if a copy of these instructions is securely affixed to the container.

READ THESE INSTRUCTIONS before using or otherwise handling the product.

FOR TURF USE:

When using or otherwise handling the product, follow the instructions of the current label except as follows:

Restrictions on use

DO NOT use this product in the home garden.

Re-entry period

RE-ENTRY: do not enter treated areas for 9 days after spray application unless wearing cotton overalls buttoned to the neck and wrist (or equivalent clothing), chemical resistant gloves and boots. Clothing must be laundered after each day's use.

PRECAUTION : hand weeding and transplanting of turf should not be performed 24 days after spray application unless wearing cotton overalls buttoned to the neck and wrist (or equivalent clothing), chemical resistant gloves and boots. Clothing must be laundered after each day's use.

FOR SEED DRESSING USE:

When using or otherwise handling the product, follow the instructions of the current label except as follows:

Restrictions on use

DO NOT use this product in the home garden.

Withholding Period

Faba beans: Do Not Harvest for 9 Days After Application.

FOR HORTICULTURAL USE:

When using or otherwise handling the product, the current label may include instructions for using the product on green beans, grapes, lettuce, stone fruit (except blossom blight), strawberries and tomatoes. *DO NOT follow those instructions.*

In all states and territories the following are new instructions for the use of procymidone. All other label instructions apply unless specified below.

Prohibited Crop Uses

DO NOT apply to green beans, grapes (except for use on grapes grown for wine production), lettuce, stone fruit (except for control of blossom blight), strawberries, and tomatoes.

Directions for use – restraints

DO NOT use this product in the home garden.

Directions for use – critical comments

Stone fruit for control of blossom blight only:

DO NOT APPLY AFTER SHUCK FALL

Grapes:

Do Not Use On Table Grapes or Grapes Used For the Production of Dried Fruit. Use on Wine-grapes only.

Withholding Periods

Faba beans, Navy beans, Stonefruit (blossom blight control), Wine-grapes, Potatoes: Do Not Harvest For 9 Days After Application.

Re-entry period

RE-ENTRY: do not enter treated areas for 9 days after spray application unless wearing cotton overalls buttoned to the neck and wrist (or equivalent clothing), chemical resistant gloves and boots. Clothing must be laundered after each day's use.

RE-ENTRY (grapes only): grape girdling should not be performed 24 days after spray application unless wearing cotton overalls buttoned to the neck and wrist (or equivalent clothing), chemical resistant gloves and boots. Clothing must be laundered after each day's use.

FOR ALL USES:

Storage and disposal

Store in a locked room or place away from children, animals, food, feedstuffs, seed and fertilisers.

Safety directions

WARNING - Contains procymidone which causes birth defects in laboratory animals. Women of child bearing age should avoid contact with procymidone.

Very dangerous particularly the concentrate. Poisonous if absorbed by skin contact or inhaled or swallowed. May irritate the eyes and skin. Avoid contact with eyes and skin. Do not inhale spray mist. When opening the container and preparing the product for use. Wear cotton overalls buttoned to the neck and wrist and a washable hat and elbow-length PVC gloves and disposable mist mask. After use and before eating, drinking or smoking, wash hands, arms and face thoroughly with soap and water. After each day's use, wash gloves and contaminated clothing.

REMEMBER: BEFORE USING PROCYMIDONE PRODUCTS YOU MUST READ AND FOLLOW THE NEW INSTRUCTIONS.