

# Pest Management in Canola



# Key canola pests

Pest group	Emergence	Vegetative	Flowering	Podding – Grain fill
Earth mites				
Lucerne flea				
Caterpillars (cutworms, loopers)				
Beetles (weevils, false wireworms)				
Slugs				
Earwigs, millipedes, slaters				
Snails				
Aphids				
Diamondback moth				
Helicoverpa				
Rutherglen bug				

# Canola spring pests



# Thresholds in spring canola

Flowering to grain fill	
Cabbage aphid	25mm, or more, of stem infested in >20% plants
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Diamond back moth	Unstressed Pre-flowering crops – 50 larvae per 10 sweeps
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	Unstressed Flowering crops – 100-200 larvae per 10 sweeps

*Source: VicDPI, Insectopedia, SARDI*

*\* Dynamic threshold developed by DAFWA*



# Canola aphids



## **Cabbage aphid**

- Powdery, greyish colonies
- Dense on growing tips



## **Turnip aphid**

- Yellow/green colonies
- Dense on growing tips
- More common early



## **Green peach aphid**

- Sparsely distributed on the underside of lower leaves - vegetative

# Aphid impact/damage

- Direct feeding injury (bud formation – late flowering)
  - wilting
  - flower abortion
  - reduced pod set
- BWY virus transmitted persistently by GPA



Cabbage aphid colony on the  
main raceme

# Risk factors

- *Brassica* green bridge (virus)
- Weather
- Low beneficial activity
- 'Hard' chemistry (any pest)



# Yield impact / thresholds

- Estimating infestation – plants/stems
- Crop stage
- Predicted weather
- Potential for compensation?

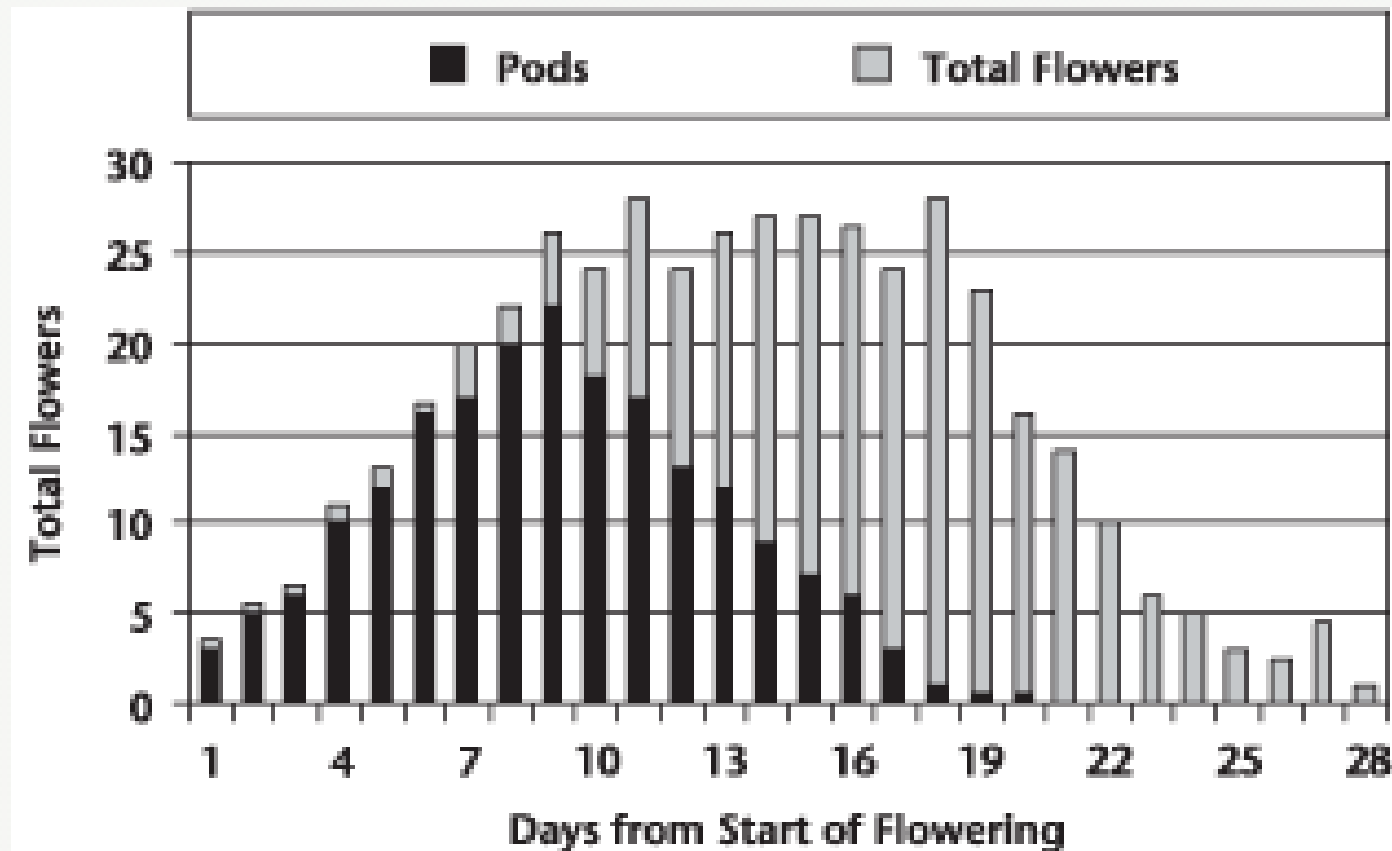
**Few demonstrated examples of  
yield loss in Australian literature**



- Thresholds: 10-50% infestation + limited compensation capacity



## Crop physiology knowledge needed



Source: Canola Council of Canada. Canola Grower's Manual. Chapter 3: Growth Stages.

## Simulated aphid damage trial. Allora, 2013.



Treatment	Yield (t/ha)
Control	2.07 a
10% of terminals removed	1.93 a
50% of terminal removed	1.98 a
90% of terminal removed	2.01 a

Treatments followed by the same letter are not significantly different ( $P < 0.05$ ).

## Best bet table – options for management and control

<b>Spring</b>	<p>Monitor <u>trends</u> in aphid and beneficial populations in crops over time. Use thresholds to guide spray decisions, considering crop stage (% flowering) and moisture stress.</p> <p>High risk where</p> <ul style="list-style-type: none"> <li>• Infestation rapidly increasing during early flowering to bud formation</li> <li>• Forecast is for warm and dry conditions to continue</li> <li>• Low/no parasitism and beneficial activity (note: this can also happen if SPs/OPs are used to control DBM/native budworm).</li> </ul> <p>If spraying:</p> <ul style="list-style-type: none"> <li>• Consider border sprays with a selective aphicide (pirimicarb) to prevent/delay build-up and retain beneficials</li> <li>• Use soft products (pirimicarb or petroleum spray oils) to retain beneficials</li> <li>• Rotate insecticide MOAs to reduce resistance selection in green peach aphid.</li> </ul>
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# Helicoverpa in canola

- ***Sweep net*** from flowering/podding
- Dynamic thresholds
- *Bt* or NPV for small larvae (< 7-8mm)



Mature budworm larva  
burrowing into a canola pod





**Economic threshold (ET) for native budworm on various crops.**

$$ET = C \div (K \times P)$$

C = control cost: chemical + application costs (\$/ha).

K = kg/ha eaten for every one caterpillar netted in 10 sweeps or per square metre.

P = price of grain per kg (price per t  $\div$  1000)

Crop	P Grain price per tonne	C Control costs chemical + application	K Loss for each grub in 10 sweeps. kg/ha/grub	ET Grubs in 10 sweeps	ET Grubs in 5 lots of 10 sweeps
<b>Field pea</b> - trailing type e.g. Helena, Dundale	200	10	50	1.0	5
<b>Field pea</b> - semi-leafless e.g. Kaspa	200	10	100	0.5	2.5
<b>Chickpea</b> - desi type	420	10	30	0.8	4
<b>Faba bean</b>	280	10	90	0.4	2
<b>Lentil</b>	420	10	60	0.4	2
<b>Canola</b>	270	10	6	6.2	31
<b>Grubs (&gt;15mm) per m2</b>					
			<b>Kg/ha/grub</b>	<b>Grubs/m2</b>	
<b>Lupin</b>	175	10	7	8.2	

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*\* Dynamic threshold developed by DAFWA*

# Other species – foliage feeders

**Cabbage white  
butterfly**

**Loopers**



***Apantales* cocoons (CWB larva)**



# Rutherglen bug (RGB)

- Highly sporadic
  - weather dependent
- Suck sap from leaves, stems, flowers, pods
  - wilting, reduced seed yield/oil quality
- Highly mobile
  - long distance migration
- Multiple life-stages





# Damage to seedling crops

Populations build up on weeds over winter –spring and move as hosts die off in summer.

Long host list, includes:

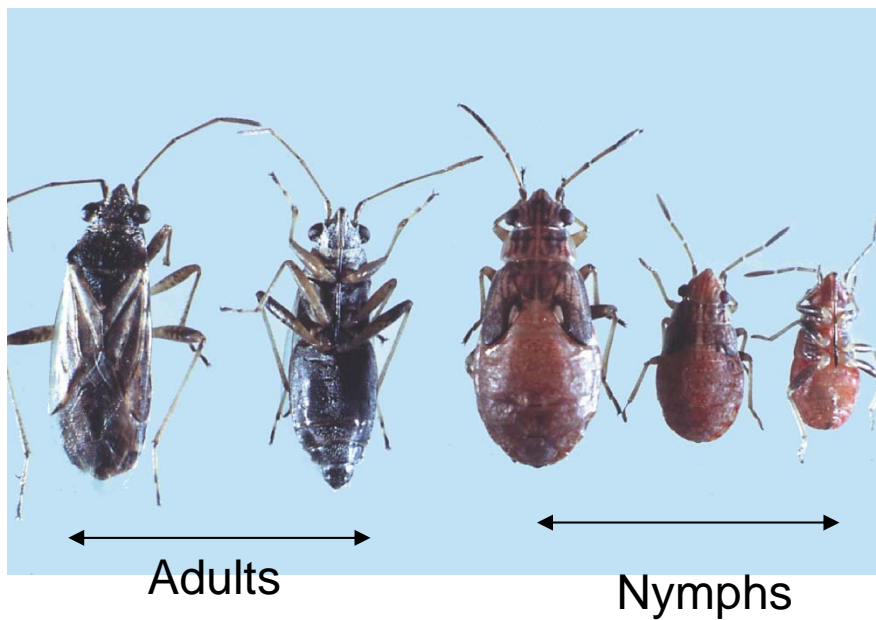
Caustic creeper, asthma weed, fleabane, fat hen, flat weed, sowthistle, khaki weed, bitter cress, pepper cress.

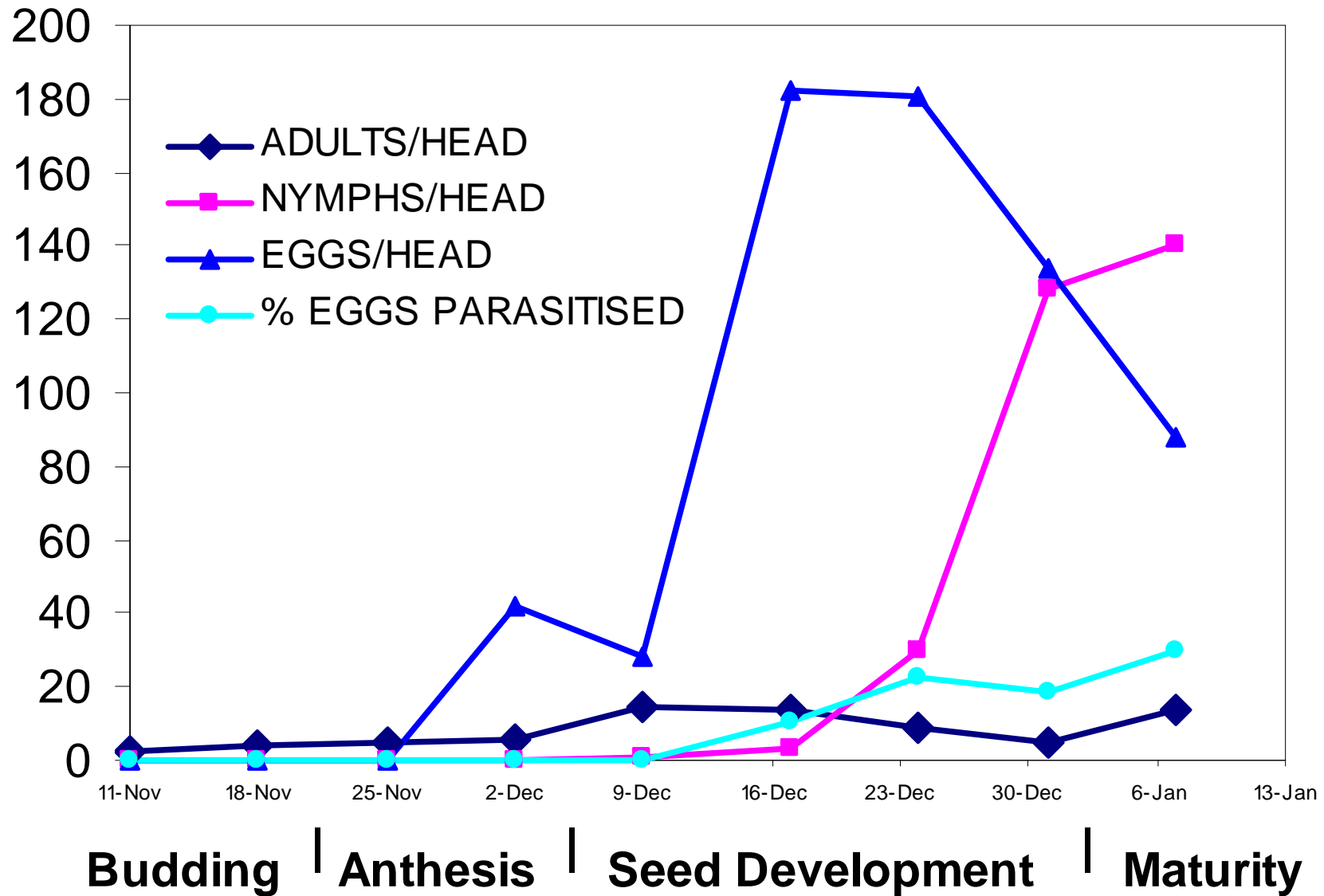
Higher risk when wet winter-spring and dry spring-summer.

RGB nymphs will move from canola stubble to seedling crops.



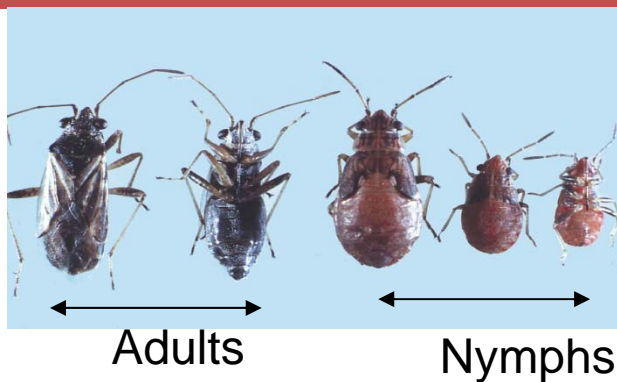
# Identifying RGB







# You need to be able to distinguish RGB from:



Green mirid nymph & adult  
(2 – 12 mm)



Shield bug nymphs (2-5 mm)



Redbanded



Apple dimpling bug  
(2.5 mm)



Big eyed bug (2-3 mm)



Brown smudge bug nymph & adult  
(3 – 5 mm)



Broken back bug (5 – 3 mm)



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# Risk factors for RGB

High risk	Reduced risk	Low risk
<ul style="list-style-type: none"> <li>Moisture stressed plants</li> </ul> <p><b>Autumn</b></p> <ul style="list-style-type: none"> <li>Weeds drying off in/near crops</li> <li>Warm conditions in late summer/autumn</li> </ul> <p><b>Spring</b></p> <ul style="list-style-type: none"> <li>Hot/dry spring and early summer</li> <li>Long distance migration into cropping areas</li> </ul>	<ul style="list-style-type: none"> <li>Plants not moisture stressed (autumn &amp; spring)</li> <li>High egg parasitoid activity (e.g. <i>Telenomus</i> sp.)</li> </ul>	<p><b>Autumn</b></p> <ul style="list-style-type: none"> <li>Later germinating crops (after nymphs disappear)</li> </ul> <p><b>Spring</b></p> <ul style="list-style-type: none"> <li>Cool/wet conditions</li> <li>No long distance migration (best monitored locally)</li> </ul>



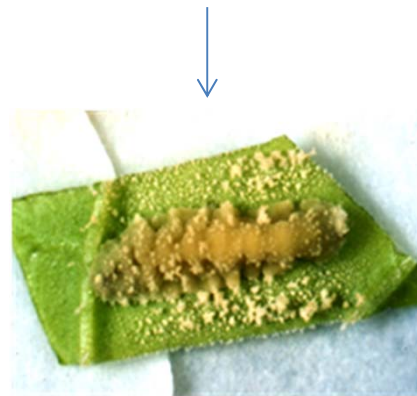
# Diamondback moth (DBM)

- Periodic outbreaks in canola
  - every 3-4 years in SA and NSW, Victoria
- Larvae feed on leaves, buds, flowers and pods
  - defoliation, reduced seed number & size





# Risk factors for DBM

High risk	Reduced risk	Low risk
<ul style="list-style-type: none"> <li>• High summer rainfall creates <i>Brassica</i> green bridge</li> <li>• Warm and dry conditions July through spring</li> <li>• No significant rainfall events (&gt;10mm)</li> </ul>	<ul style="list-style-type: none"> <li>• Significant heavy rainfall (&lt;10mm) dislodges and drowns larvae</li> <li>• High beneficial activity and/or DBM parasitism</li> </ul>	<ul style="list-style-type: none"> <li>• Cool, moist conditions late winter through spring</li> <li>• Epizootics of fungal disease (e.g. <i>Zoophthora radicans</i>)</li> </ul>
		

Lincoln weed  
Perennial DBM host

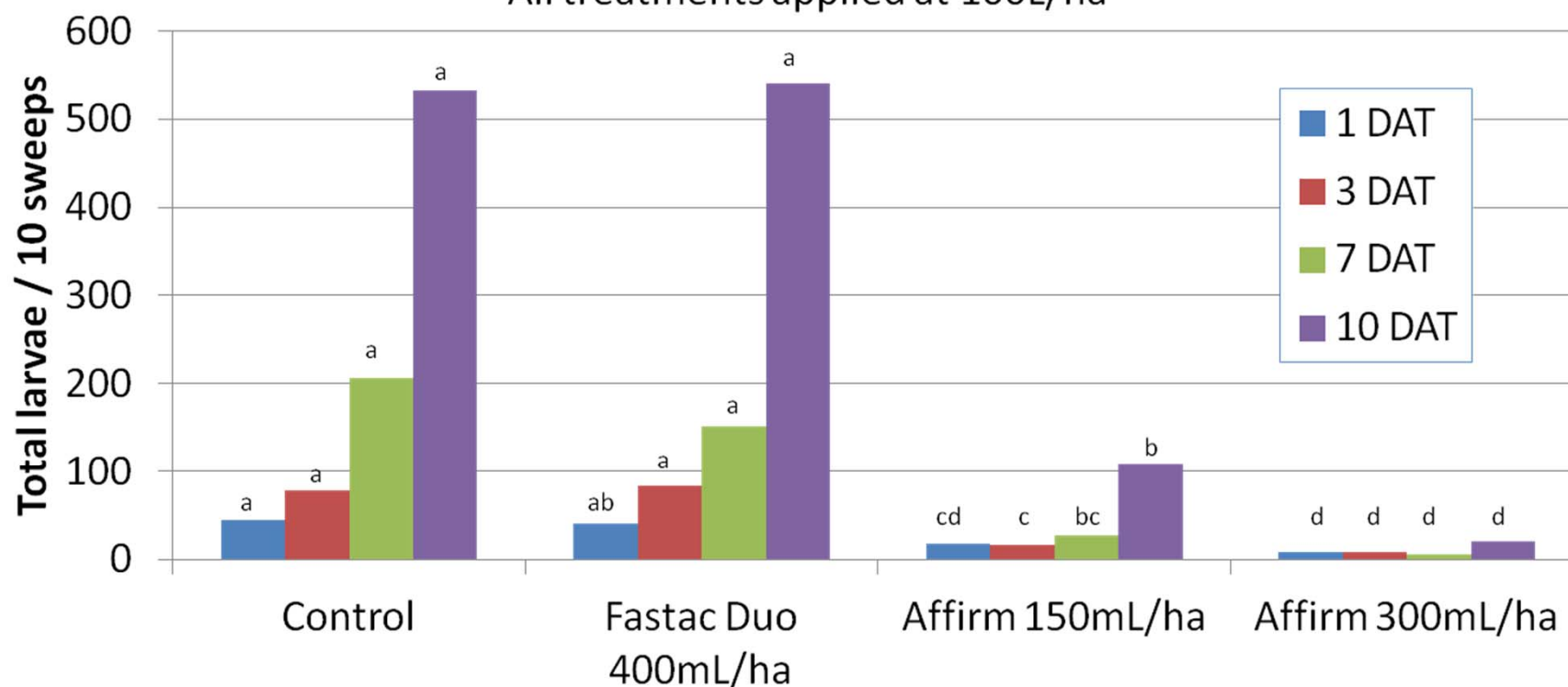
*Diadegma semiclausum*  
Key DBM parasitoid



# Insecticide efficacy for DBM

**Hatherleigh, SA. Peracto Research (2008)**

All treatments applied at 100L/ha



Source: Syngenta, SARDI (G. Baker)

# DBM monitoring and thresholds

- Minimum of 5 sets of 10 sweeps
- Calculate larvae per 10 sweeps



Crop stage	Moisture stressed?	Spray threshold
Pre-flowering	Yes	> 30 larvae / 10 sweeps
	No	> 50 larvae / 10 sweeps
Majority in flower	Yes	< 100-200 larvae per 10 sweeps
	No	>100-200 larvae / 10 sweeps

# Insecticide selection in canola

MOA		Canola aphids	DBM	Native budworm	Rutherglen Bug	Beneficial toxicity
11	<i>Bt</i>		<8mm	<8mm		Very Low
	NPV			<7mm		Very Low
	Petroleum spray oils	(s)	Mix <i>Bt</i>	(s)		Very Low
1A	Pirimicarb					Very Low
6	Emamectin					Mod
5	Spinetoram					Mod
1A	Methomyl		R?	WA		High
1B	OPs		R			High
3A	Pyrethroids		R			Very High

Registered R = resistance (s) = suppression

# Canola establishment



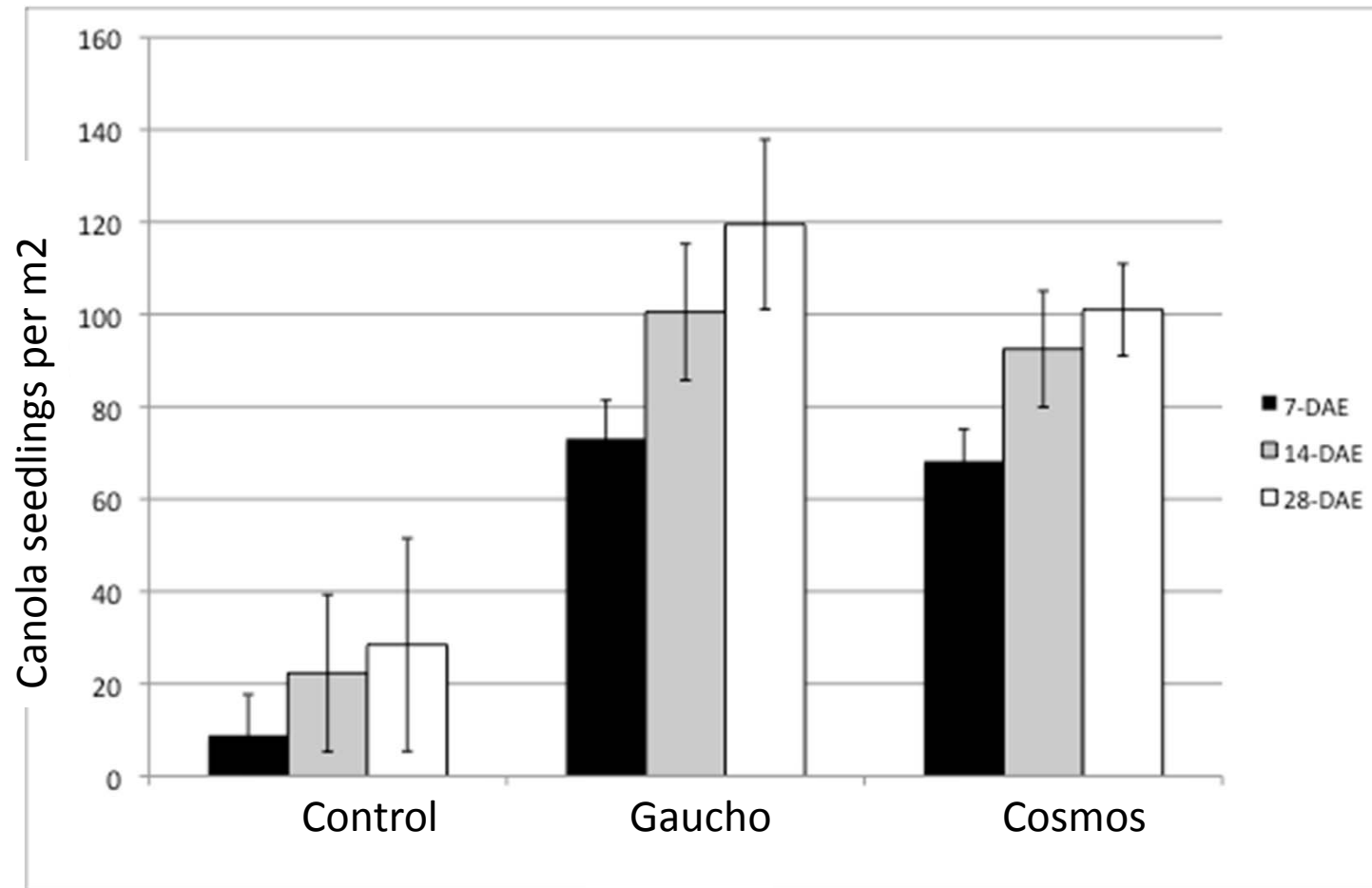
# Sowing tactics

Can reduce pest impact:

- Early sowing
- High vigour varieties
- Slightly higher seeding rates



# Seed treatments



**Seed treatments can protect canola seedlings from mites**

McColl & Umina. *Unpublished data*