



# Pest Management in Canola





## Supporting research organisations



Queensland Government  
Department of Agriculture, Fisheries and Forestry



Department of  
Primary Industries



## Financial workshop support



Dow AgroSciences



## Workshop facilitation



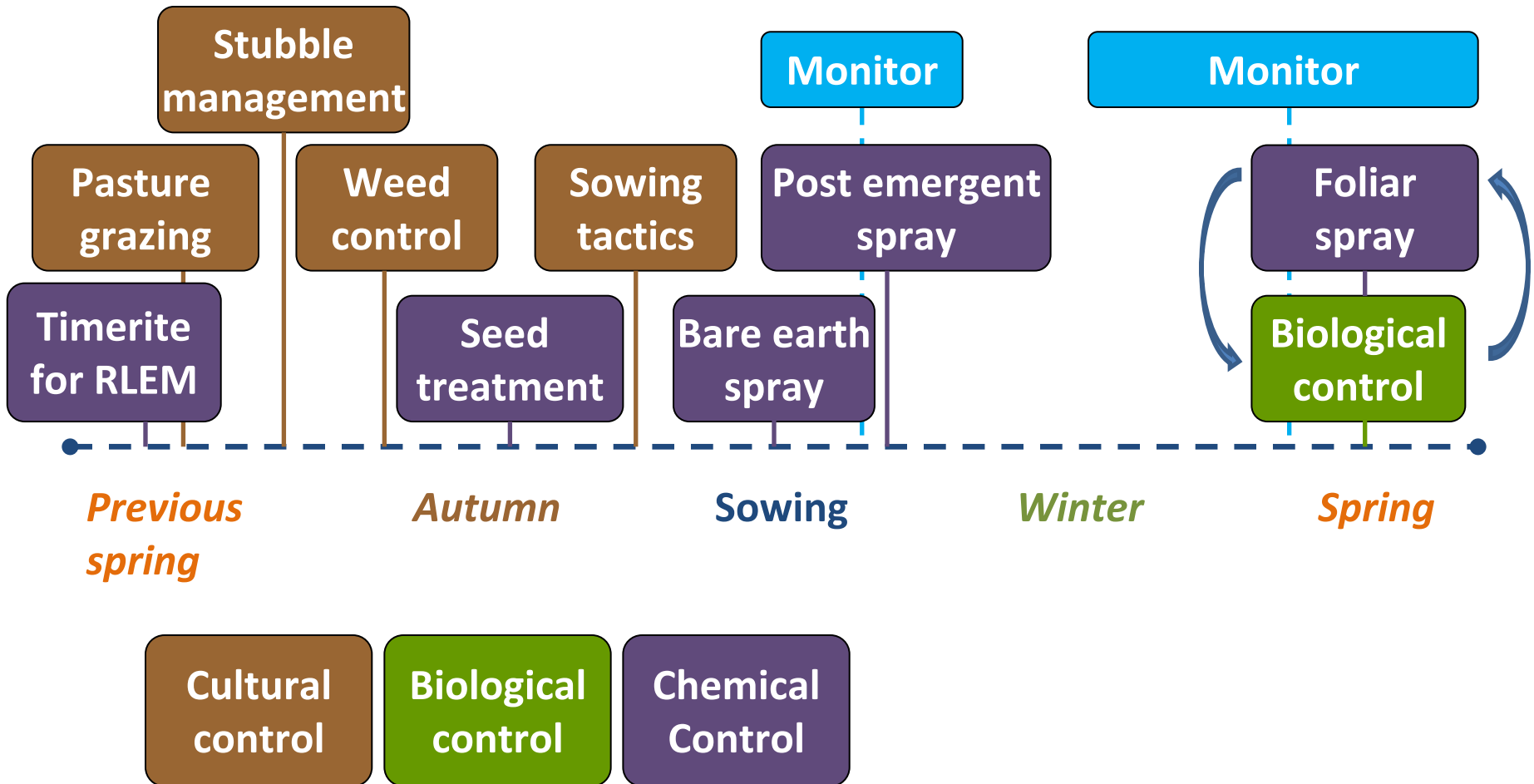


# Key canola pests

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				
Native budworm				
Rutherglen bug				



# Decision timeline





# Canola establishment





# Canola establishment best bet

Pest	Previous spring/summer	Pre-sowing	Emergence
Earth mites & lucerne flea	<ul style="list-style-type: none"> <li>Assess risk</li> <li>Timerite</li> <li>Pasture grazing</li> </ul>	<ul style="list-style-type: none"> <li>Assess risk</li> <li>Sowing tactics</li> <li>Consider ST/PPE</li> </ul>	<ul style="list-style-type: none"> <li>Monitor</li> <li>Correct ID</li> <li>Product choice</li> </ul>
Slugs	<ul style="list-style-type: none"> <li>Assess risk</li> </ul>	<ul style="list-style-type: none"> <li>Manage stubble</li> <li>Sowing tactics</li> <li>Bait</li> </ul>	<ul style="list-style-type: none"> <li>Shelter traps</li> <li>Bait</li> </ul>
False wireworms	<ul style="list-style-type: none"> <li>Assess risk</li> </ul>	<ul style="list-style-type: none"> <li>Monitor</li> <li>Sowing tactics</li> <li>Seed treatment</li> </ul>	<ul style="list-style-type: none"> <li>No options (except BFB)</li> </ul>
Earwigs, millipedes and slaters	<ul style="list-style-type: none"> <li>Shelter traps</li> <li>Manage stubble</li> </ul>	<ul style="list-style-type: none"> <li>Cultivate</li> <li>Bait</li> </ul>	<ul style="list-style-type: none"> <li>Inspect at night</li> </ul>



# Canola spring pests





# Key canola aphid species



## Cabbage aphid

- Powdery, greyish colonies
- Dense on growing tips



## Turnip aphid

- Yellow/green colonies
- Dense on growing tips
- More common in drier years



## Green peach aphid

- Sparsely distributed on the underside of lower leaves



# Aphid impact/damage

- Early infestations worse (bud formation – late flowering)
  - Wilting
  - flower abortion
  - Reduced pod set
- Virus (BWYV) transmitted persistently by GPA



Cabbage aphid colony on the terminal raceme



# Risk factors for aphids

High risk	Reduced risk	Low risk
<ul style="list-style-type: none"><li>• Summer rainfall creates <i>Brassica</i> green bridge (aphid &amp; virus)</li><li>• Mild winter, warm/dry spring</li><li>• Low beneficial activity and/or aphid parasitism<ul style="list-style-type: none"><li>- may also occur if SPs/OPs used in spring</li></ul></li></ul>	<ul style="list-style-type: none"><li>• High beneficial activity and/or aphid parasitism</li><li>• Cool spring</li></ul>	<ul style="list-style-type: none"><li>• Cold, wet conditions</li></ul>



# Canola aphid management

- Monitoring
  - Visual inspection
- Weather
- Biological control
- Thresholds
  - 20% plant infested (WA)
- Selective aphicide
  - Pirimicarb



Parasitised aphid 'mummies'



# Aphid natural enemies



**Parasitoids**



**Ladybird beetles**

e.g. *Coccinella transversalis* (A/L)



**Damsel bugs**

*Nabis kinbergii* (A/N)



**Lacewings**

Green (L) and brown (A/L)



**Hoverflies**

Syrphidae (L)

(Predatory lifestage): A = adults L = larvae N = nymphs

Would you spray?








# 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



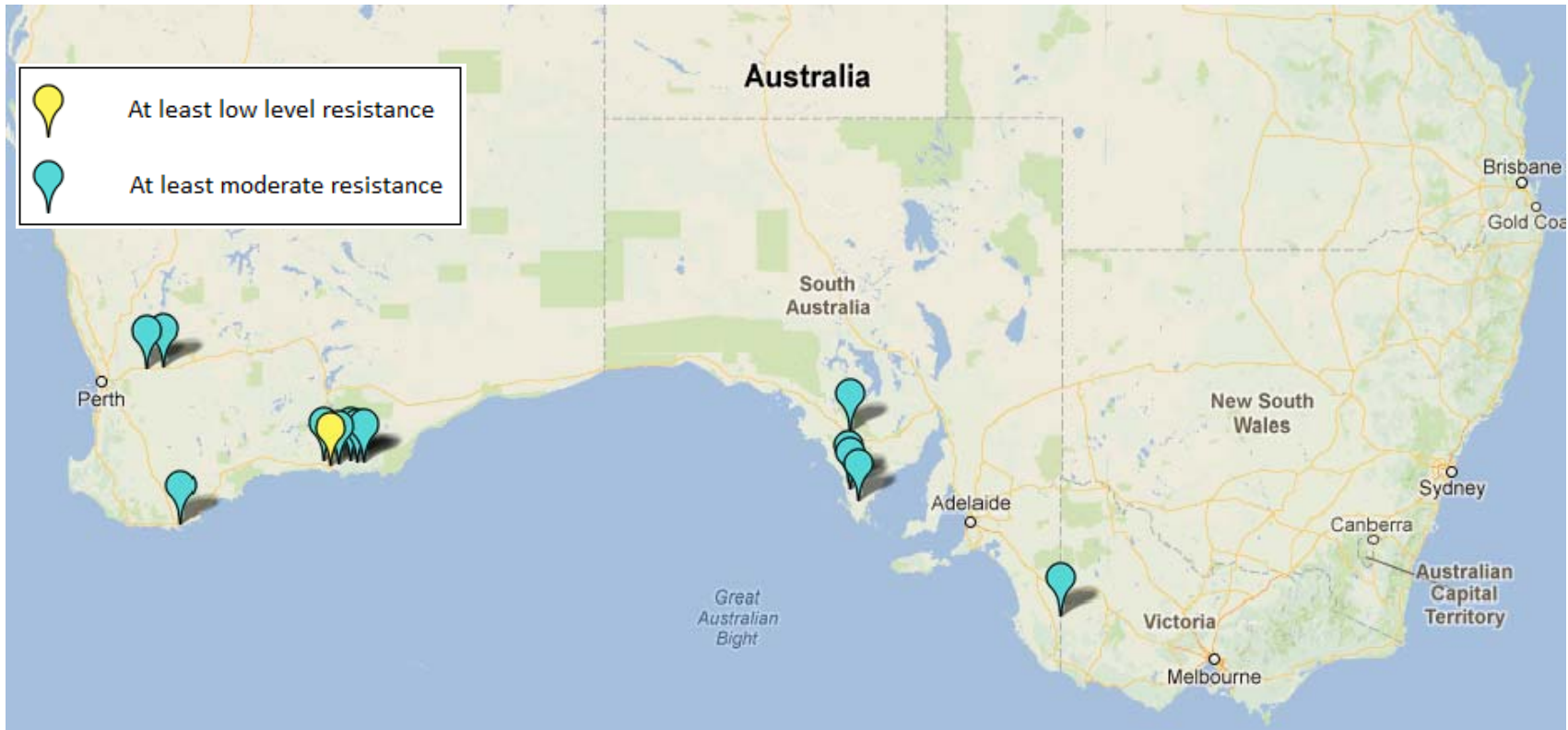
# Managing DBM

- Difficult target
  - Overlapping generations
  - Larvae throughout canopy
  - Spray penetration
  - Rapidly evolves insecticide resistance
- Product selection, good coverage critical





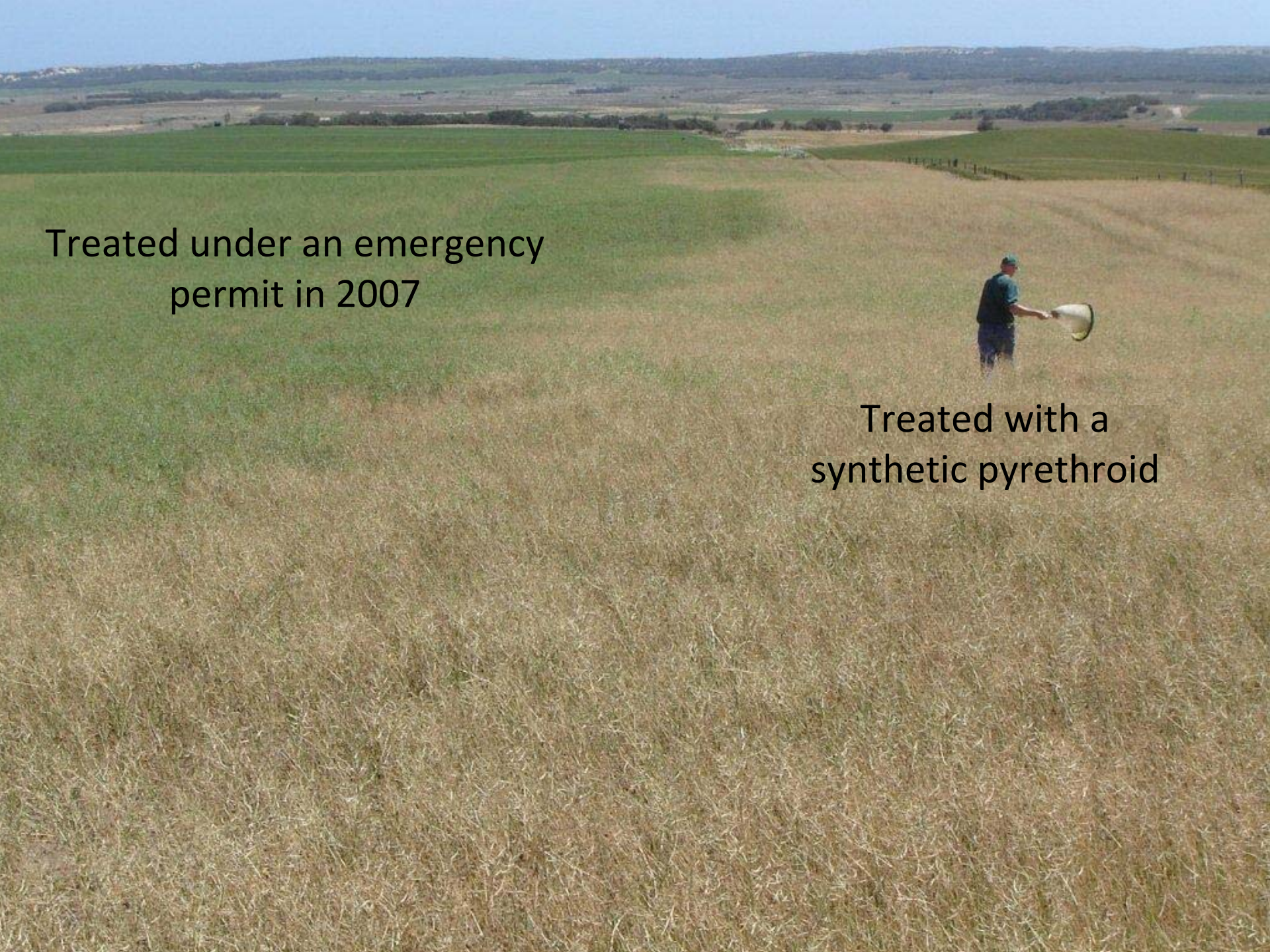
# DBM insecticide resistance



**Alpha-cypermethrin resistance in DBM collected from canola crops (2006-11)**

Powis & Baker, 2012. *Unpublished data*

**Similar story with organophosphates**






Treated under an emergency  
permit in 2007

Treated with a  
synthetic pyrethroid



# DBM – a best bet IPM strategy

Previous summer/autumn	Spring
<ul style="list-style-type: none"> <li>Manage <i>Brassica</i> green bridge (ideally area wide)</li> </ul>	<ul style="list-style-type: none"> <li>Sweep net &amp; thresholds until crop maturity</li> <li><u>Assess risk</u> of rapid build-up (continuously)</li> <li>Consider <i>Bt</i> where                             <ul style="list-style-type: none"> <li>- <i>Diadegma</i> prevalent</li> <li>- High % of DBM larvae &lt; 8mm</li> </ul> </li> <li>Emamectin/spinetoram for larger larvae</li> <li>Rotate MOA across seasons</li> </ul>
Winter	
<ul style="list-style-type: none"> <li>Sweep net from mid-winter</li> </ul>	<p>Parasitised DBM pupa – note capsule shape</p> <div>    </div>



# Native budworm in canola

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



Mature budworm larva  
burrowing into a canola pod



# Insecticide selection

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



# Key messages

- Monitoring
- Thresholds
- Look after beneficials
- Soft/selective options
- Minimise SP use in spring canola






# 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





# 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>



# RGB – best bet IPM strategy

Summer/autumn	Spring
<ul style="list-style-type: none"><li>• Remove summer weeds near crops &gt; 4 weeks before sowing</li><li>• Insecticide seed treatment</li><li>• Monitor during establishment (along with other pests)</li><li>• Spot spray as needed</li></ul>	<ul style="list-style-type: none"><li>• Monitor from flowering to windrowing</li><li>• Thresholds – 10 adults or 20 nymphs per plant (consider moisture stress)</li><li>• Registrations limited to SP/OPs<ul style="list-style-type: none"><li>- may flare aphids/DBM/native budworm</li></ul></li><li>• Spot spray crop/ nearby weeds as needed</li><li>• Monitor for re-invasion</li></ul>