Sound IPM strategies for DBM control in brassica vegetable crops.

**Beneficials**
- Focus on preserving naturally occurring and commercially released beneficial insects in the crop e.g. supply nectar sources and harbouring sites for wasps.
- Use insecticides that have minimal impact on key beneficial insects such as *Diadegma semiclausum*, *Micromus tasmaniae* (brown lacewing) and predatory bugs. *Bt* sprays are the ultimate here for safety to beneficials however the horticultural industry will soon be releasing scientific data indicating the short and long term impacts of currently registered insecticides on a range of beneficial insects. Stay tuned.

**Cultural**
- Control and destroy volunteer brassica weeds, harvested crop areas and abandoned brassica vegetable and brassica leafy vegetable crops in a timely manner so as not to breed up DBM populations.
- Transplant DBM free seedlings from commercial nurseries.
- Regularly (at least weekly) monitor the crop and document pest incidence and developmental stages.
- Be mindful of the rate of development of DBM based on prevailing weather conditions. Warmer growing conditions means faster developing insects, so shorter spray intervals may be required for all products. This is particularly the case for *Bt* sprays.

**Chemical (last resort)**
- Only apply an insecticide if economic spray thresholds are reached. Target insecticides to the earlier instar stages as they are more susceptible particularly if tolerance levels to insecticides are increasing. Always document effectiveness of each insecticide application and never re-spray a failure with the same mode of action insecticide. Inform your local reseller or agronomist of any spray failures and try and understand why it has happened.
- Ensure spraying equipment is properly calibrated and in good working order so as to achieve good spray coverage. Refer to product labels for required spray quality (droplet size) and water volumes for particular crop stages. There is a lot of industry knowledge available regarding application technology and environmental conditions required at the time of application to optimise insecticide performance.
- Within the nominated IRMS windows, use a single Mode of Action insecticide in a “block” eg. could be two or three sequential applications, so as to coincide with a single pest generation and then rotate to a different Mode of Action insecticide.
- DO NOT apply any Mode of Action group to more than 50% of the life of the crop.
- Abide by the legal maximum allowable number of applications of a particular insecticide per crop per season. These restrictions are in place for sound insecticide resistance management and MRL compliance reasons.
- Use registered insecticides at the recommended label rates and adjuvants. DO NOT reduce label rates.
- DO NOT use mixtures of insecticides for controlling DBM.
- Avoid broad spectrum insecticides eg. OP’s, carbamates and synthetic pyrethroids or only use strategically. There are known high levels of DBM resistance to these products and they are also highly disruptive to beneficial insects.

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### Plutella xylostella control in brassica vegetable and brassica leafy vegetable crops BEST MANAGEMENT PRACTICE.

Within constraints of each window based on current DBM IRMS:

<table>
<thead>
<tr>
<th>Crop growth stage</th>
<th>Seeding</th>
<th>Early vegetative</th>
<th>Mid vegetative</th>
<th>Protection of saleable commodity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>Rotate <em>Bt</em> kurstaki (eg. <em>Dipel</em>®) and <em>aizawai</em> (<em>Xentari</em>®) in conjunction with weekly crop monitoring and focus on sound IPM principles.</td>
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<tr>
<td><strong>Step 2</strong></td>
<td><strong>Success® Neo</strong>&lt;br&gt;<strong>Proclaim®</strong>&lt;br&gt;<strong>Avatar®</strong>&lt;br&gt;<strong>Movento®</strong>&lt;br&gt;<strong>Durivo®</strong>&lt;br&gt;</td>
<td><strong>Bt</strong>, <em>Coragen®</em>&lt;br&gt;- to reduce selection pressure on Group 28, it is recommended to use one (1) application per crop per season&lt;br&gt;- if <em>Durivo®</em> is used in crop at transplant, then follow Group 28 is not to be used on that same crop.</td>
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<td></td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>IF DBM population becomes too mixed in size, then knockdown population using a strategic application of <em>Regent®</em> and then resume using more selective options as in Step 2.</td>
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</tbody>
</table>

“2-Window” Insecticide Rotation Strategy for Diamondback Moth in Brassica Vegetable and Brassica Leafy Vegetable Crops for the Lockyer Valley

Focus on sound IPM principles:
- Rotate Bta (e.g. Xentari®) & Btk (e.g. Dipel®)
- Target sprays at egg hatch / 1st instar stage
- Monitor crops at least weekly
- Broad spectrum chemicals will ‘flare’ DBM

Summer Production Break
A summer production break is recommended from November through to January to reduce the Diamondback moth population and minimise exposure to available chemicals

Use of Bts as the primary control strategy
Rotate Bacillus thuringiensis (Bt) strains aizawai (e.g. Xentari®) & kurstaki (e.g. Dipel®) as the primary form of chemical control

First Window Insecticide Rotation - February to April
Bt (G. 11 strains Bta & Btk). Bts form the primary control strategy
Proclaim® (G. 6)
Durivo® OR Belt® Coragen® (G. 28)
*Durivo® drenches to cease by end of March
** If Durivo® drenches are used then no foliar G28s to be used in that crop

Second Window Insecticide Rotation - May to October
Bt (G. 11 strains Bta & Btk). Bts form the primary control strategy
Avatar® (G. 22a)
Success Neo® (G. 5)
Movento® (G.23) (1st instar larvae only)

Caution: Regent® (G. 2b) may be used in warmer periods for crop ‘clean up’ however this chemical should be used with caution due to its disruptive nature - broad spectrum chemicals ‘flare’ DBM.

The detailed information within this document has the support of the Lockyer Valley Growers Inc. committee, industry specialists and CropLife Australia