IPM on Kangaroo Island
November 2022

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IPM Technologies Pty Ltd

Contents

Background

In February 2022 a workshop on IPM was conducted via Zoom between 2 farmers on KI and Paul Horne and Rebecca Addison from IPM Technologies P/L, facilitated by Cassandra Douglas-Hill from the KI Landscape Board. In this workshop a template for IPM strategies for crops and pastures on KI, suitable for each farmer) was developed. These strategies are presented in Appendices 1 and 2.

Following the workshop, it was decided to plan two visits by IPM Technologies to help implement the draft strategies and refine them as required. These visits were tentatively planned for August and November 2022.

August Visit

Paul Horne and Rebecca Addison visited two broadacre farms KI on August 22nd and 23rd. In addition, they visited two vineyards to discuss IPM implementation with the vineyard managers. On August 24th Paul Horne ran two IPM workshops – the first for a general audience and the second for viticulture.

Suggestions that were made on each visit are presented here, and the IPM summaries from the workshops are summarized in Appendices 3 and 4.

Farm 1 (sheep and cropping)

Suggestions made were:

1. Redlegged earth mite (RLEM). There is a high risk of damage by RLEM in paddocks to be cropped next year. The options are to spray a broad-spectrum insecticide at a time suggested using the TimeRite strategy and/or use a seed dressing such as fipronil (*Cosmos*) at planting.
2. A seed dressing of *Gaucho* will work if the population of RLEM is not too high, as it repels rather than kills the mites. So, a fipronil seed dressing will give better results.
3. Lucerne flea. There is a moderate to high risk of damage by lucerne flea. Seed dressings would be useful here.
4. Predatory mites: There were low levels of predatory mites, but populations of these should increase once broad-spectrum insecticides are not sprayed.
5. Avoid spraying broad-spectrum insecticides after planting, except as a border spray in future years, to prevent reinvasion by RLEM.
6. Slugs. There is a high risk of damage by slugs and there are probably two species or more present. Use tiles to monitor for slugs and identify the species present (a separate slug identification guide will be provided).
7. Look at the type of bait. Expensive rain-fast baits may not be required if slugs are already active.
8. Two baitings, about 2 weeks apart, may be needed if two species (*Milax gagates* and *Deroceras reticulatum*) are both present.
9. If slug populations are high, consider a spring baiting.
10. Carabid beetles. These predators can also be found using tiles.

11. Cockchafers are present. Note that red-headed and yellow-headed cockchafer grubs never come to the surface and so insecticide applications are not effective.

Farm 2 Mixed livestock and cropping

Suggestions made were:

1. Continue with the methods that are currently used to increase populations of beneficial invertebrates.
2. Good numbers of beneficial species including predatory mites, carabid beetles, anthicid beetles, dung beetles and oribatid mites were found on this visit.
3. Increase surface organic matter and cover to provide improved habitat for beneficial species.
4. Continue to reduce levels of capeweed in particular.
5. Avoid spraying for RLEM with broad-spectrum insecticides. (If such a spray is applied then leave a section unsprayed to compare what happens).
6. When sowing new pasture seed, trial planting cereals first and then broad-leaf species 2 months later. This could be done on a small section of one paddock.

Vineyard IPM

The workshop summarized in Appendix 4 covers most of the points discussed on the two visits to vineyards, but several points are emphasized here:

1. Avoid multiple sprays of Mancozeb (and Polyram). These are disruptive to predatory mites that control bud mite and rust mite.
2. Avoid spraying lime Sulphur
3. Minimise applications of wettable Sulphur. This means not using high rates and not frequent applications.
4. A list of fungicides that could be used for powdery mildew control will be provided separately.
5. Garden weevil. Map damage by garden weevil, then next spring rotary hoe the inter-row in these areas when the bulk of the population are changing from larvae to pupae.
6. Snails. Reduce habitat and food source by keeping grass short.
7. Consider the use of ducks or Guinea fowl to control snails.
8. Vine moth. Bt sprays such as *Dipel* are highly effective against these caterpillars. Ensure that the product is not more than 2 years old.
9. Short legged sheep. See this article - https://wagoodfoodguide.com/spring-series-road-tripping-in-the-states-south-west/

November Visit

Paul Horne and Rebecca Addison revisited the two Kangaroo Island broadacre farms on November 15th, 2022. The discussions were mainly about reinforcing the previous points and approaches that had been developed in the February Zoom workshop and during the August visit. One point to emphasise is that we are available to discuss any pest management issues that either farmer is dealing with, particularly any decision involving potential insecticide or miticide applications.

Farm 1 (sheep and cropping)

Suggestions made were:

1. Control slugs using appropriate slug baits. Given the likely autumn planting it would be worth considering using a rainfast bait such as Metarex or Slugoff first and then a cheaper bait 2 weeks later or at crop emergence.
2. Consider the number of bait points per square metre as well as kg/ha.
3. Two baitings like this would be better in our view than three baitings using lower rates.
4. Avoid using broad-spectrum insecticides. We sampled an area treated with a synthetic pyrethroid and the only insects found were diamondback moth caterpillars. No beneficial species were present.
5. A nearby section of the same paddock that had not been treated with a synthetic pyrethroid by comparison had high numbers of beneficial species such as hoverflies, ladybird beetles and parasitoid wasps.
6. The insecticide had reduced caterpillar numbers but at the cost of losing all beneficial species in that area. Selective insecticides are available.

Farm 2 Mixed livestock and cropping

Suggestions made were:

1. Continue as planned, avoiding broad-spectrum insecticides and not grazing too hard to maintain organic matter on the soil surface.
2. Similar species were found to the August visit except that no redlegged earth mite were present this time.
3. Predatory mites were still active and in good numbers.
4. Predatory carabid beetles were also easily found.

Photos of the insects and mites that we found on the two visits are provided in Appendix 5.

Appendices

In the Pesticide column, those in Red are not compatible with one or more biological control agents listed, but those in Green are compatible. Check current registrations as this table is a guide only.

Appendix 1: IPM in Pastures

Appendix 2: IPM in Cereals

Appendix 3: General IPM workshop summary

Appendix 4: Viticulture IPM summary

Appendix 5: Invertebrates found on the two visits

Appendix 1: IPM in Pastures Kangaroo Island February 2022

Pest	**Beneficial**	**Cultural**	**Pesticide**
Redlegged Earth Mite	Predatory mites Predatory beetles Predatory earwigs	Avoid Capeweed Grazing management Variety Plant health CaCl?	Lemat; Dimethoate; Synthetic pyrethroids, Organophosphates Seed dressings Border sprays
Blue Oat Mite			
Lucerne Flea	Snout mites		
Slugs	(Carabid beetles)	Intensive Grazing	Baits: Metaldehyde, Fe-chelate Mesurol
Redheaded Pasture Cockchafer	(Carabid beetles)	Avoid rank pasture, early spring	Nil (Metarhizium)
Blackheaded Pasture Cockchafer	(Carabid beetles)	Avoid bare ground and dung buildup (summer)	Synthetic pyrethroids
Cutworm	Wasps Damsel bugs Shield bugs	Nectar source for beneficial species	Border sprays Bt – eg Dipel Synthetic pyrethroids
Armyworm	Wasps Damsel bugs Shield bugs		

Appendix 2: IPM in Cereals Kangaroo Island February 2022

Pest	Beneficial	Cultural	Pesticide
Redlegged Earth Mite	Predatory mites Predatory beetles Predatory earwigs	Avoid Capeweed Minimum tillage Stubble retention	LeMat; Dimethoate; Synthetic pyrethroids, Organophosphates Seed dressings Border sprays
Blue Oat Mite			
Lucerne Flea	Snout mites		
Slugs	(Carabid beetles)	Avoid cloddy ground Rolling	Baits: Metaldehyde, Fe-chelate Mesurol Rates appropriate for pest level
Aphids	Ladybirds, Lacewings, Hoverflies, Wasps	Plant late Nectar source for beneficials	Pirimor Late spray of Dimethoate
European Earwigs	nil	Avoid cloddy ground Rolling Plant early	Baits Seed dressings
Armyworm	Wasps Predatory bugs	Nectar source for beneficials	Bt sprays
Crickets	-	Avoid cracking ground	Baits

Appendix 3: General IPM workshop summary August 2022

Pest	**Beneficial**	**Cultural** Provide nectar source	**Pesticide**
Redlegged Earth Mite Blue Oat Mite	Predatory mites Predatory beetles Predatory earwigs	Avoid Capeweed Grazing management Variety Plant health	Lemat; Dimethoate; Synthetic pyrethroids, Organophosphates Seed dressings Border sprays
Lucerne Flea	Snout mites		
Slugs	(Carabid beetles)	Intensive Grazing	Baits: Metaldehyde, Fe-chelate ; "*Protect-Us*" Mesurol
Redheaded Pasture Cockchafer	(Carabid beetles)	Avoid rank pasture, early spring	Nil (Metarhizium)
Blackheaded Pasture Cockchafer	(Carabid beetles)	Avoid bare ground and dung buildup (summer)	Synthetic pyrethroids
Olive scale	Wasps Damsel bugs Shield bugs	Nectar source for beneficial species Open canopy Decrease dust	Oil Admiral (not safe to ladybirds)
Harlequin bugs	Wasps	Weed control, particularly marshmallow weed	Synthetic pyrethroids Oils

Appendix 4: Viticulture IPM summary August 2022

Pest	**Beneficial**	**Cultural** Nectar source	**Pesticide**
Lightbrown apple moth Vine moth	Green lacewings Wasp parasitoids	Manage inter-row; Mow every 2nd row in spring Reduce capeweed Reduce dust "Block-out" seed mix	Dipel* Entrust* Altacor *Isomate* lures: Mating disruption for LBAM
Mealybugs	Green lacewings Wasp parasitoids		-
Garden weevil	Birds	Map damage Rotary hoe pupae in spring	Avatar Avatar in vine guards
Rust mite Bud mite	Predatory mites		Sulphur and oil at bud burst
Snails	Birds	Reduce grass cover	Bait after copper spray
Earwigs	Currawongs?		SP insecticide in vine guards only
Powdery mildew	-	-	Mancozeb; Polyram High rates and frequency of Sulphur

Appendix 5: Invertebrates found on the two visits.

Slugs: *Milax gagates* (L) and *Deroceras reticulatum* (R). See separate Slug ID Guide.


Mites: Redlegged earth mite (L), Predatory Snout mite (C), Oribatid Mite (R) – decomposer.



Springtails: Lucerne flea (L), Decomposer sp (R)

Millipedes: Portuguese millipede

Insects:

European Earwigs: Juvenile (L), Male (C) and Females (R)



True Bugs (Hemiptera).

Tenebrionid beetles:

Weevils: Vegetable weevil larva

Scarab beetle larvae (cockchafers)

Caterpillars (Gum leaf skeletoniser)

Wasps

Diadegma semiclausum (parasite of diamondback moth caterpillars). Adult (L) and Juvenile maggot (R)


We also saw ladybird beetles (L) and hoverflies (R) similar to these (photographed elsewhere).