

# 2022 FLYSTRIKE RD&E TECHNICAL FORUM

Modelling of blowfly chemical  
resistance

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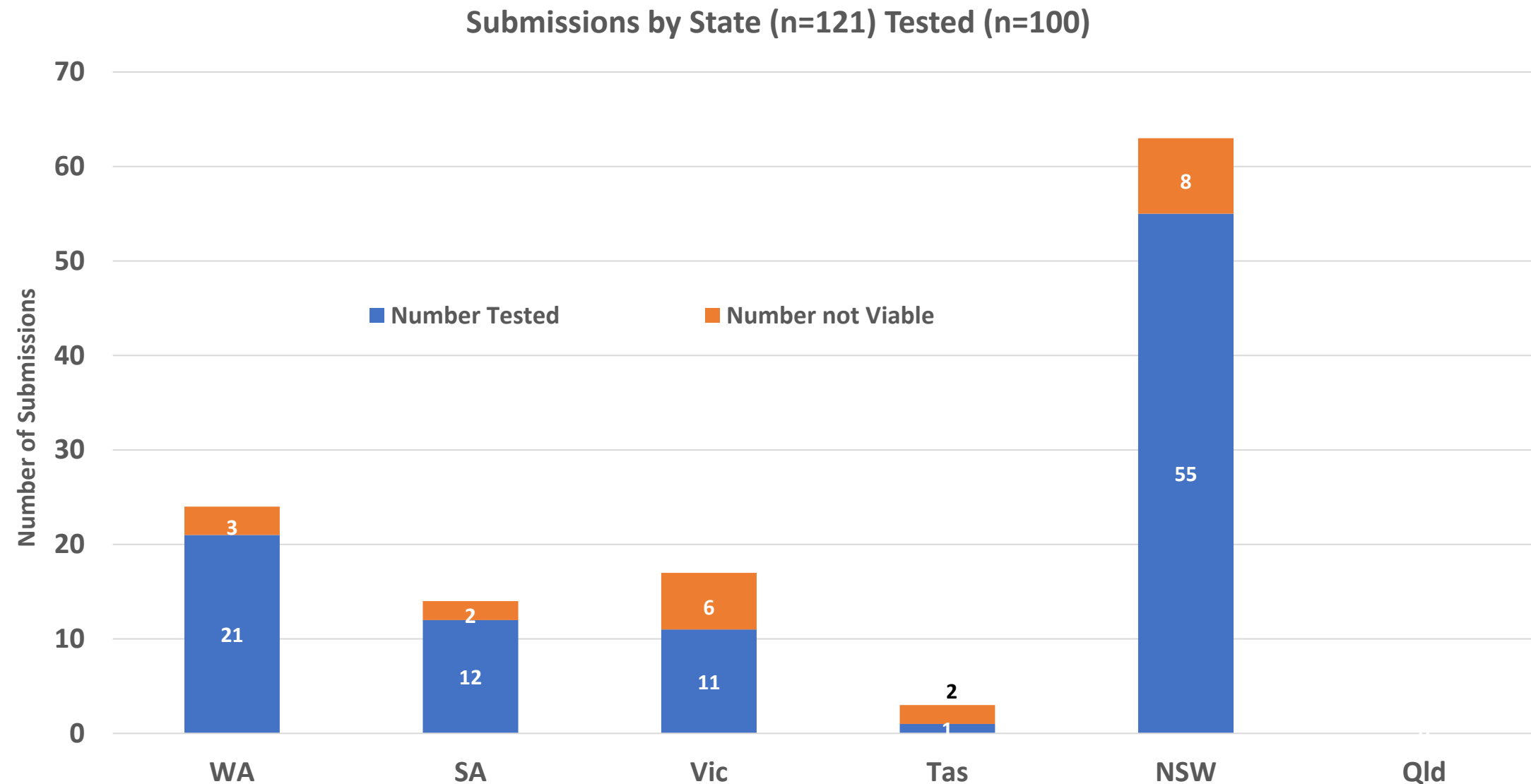




# **Modelling of Blowfly Chemical Resistance.**

- **Ectoparasite Insecticide Resistance Update – 2018/20.**
- **Flystrike - Insecticide Multi- Resistance – 2022/24**

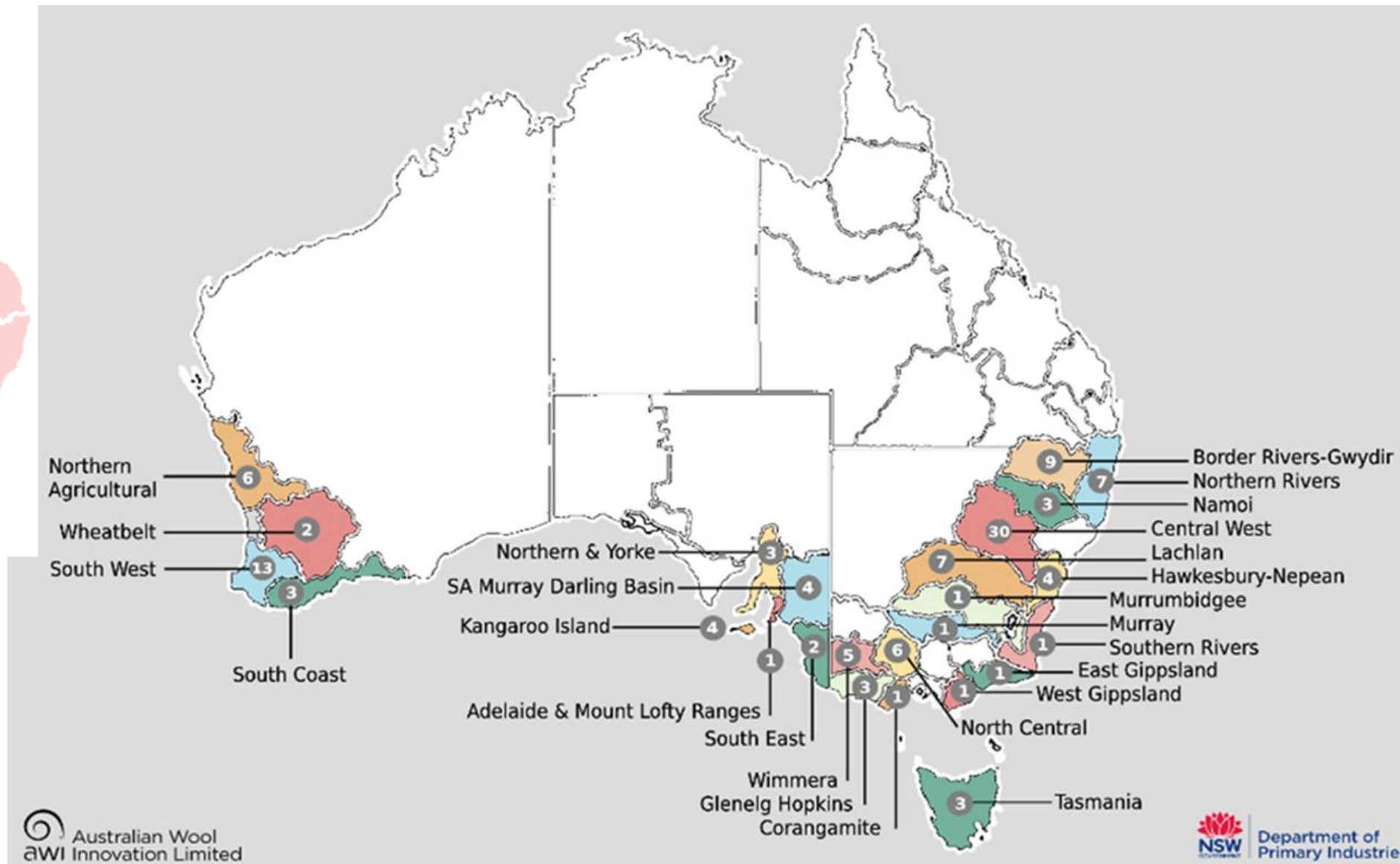
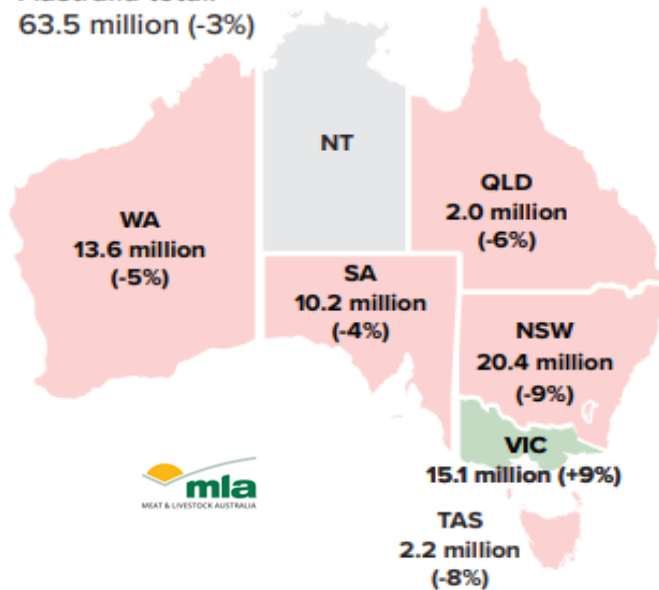
## 2018 - 2020 Project – Submission by State - Viable and Non-Viable



# 2018-2020 Project – Submissions by NR Regions

## Sheep changes by state 2019–20 on 2018–19

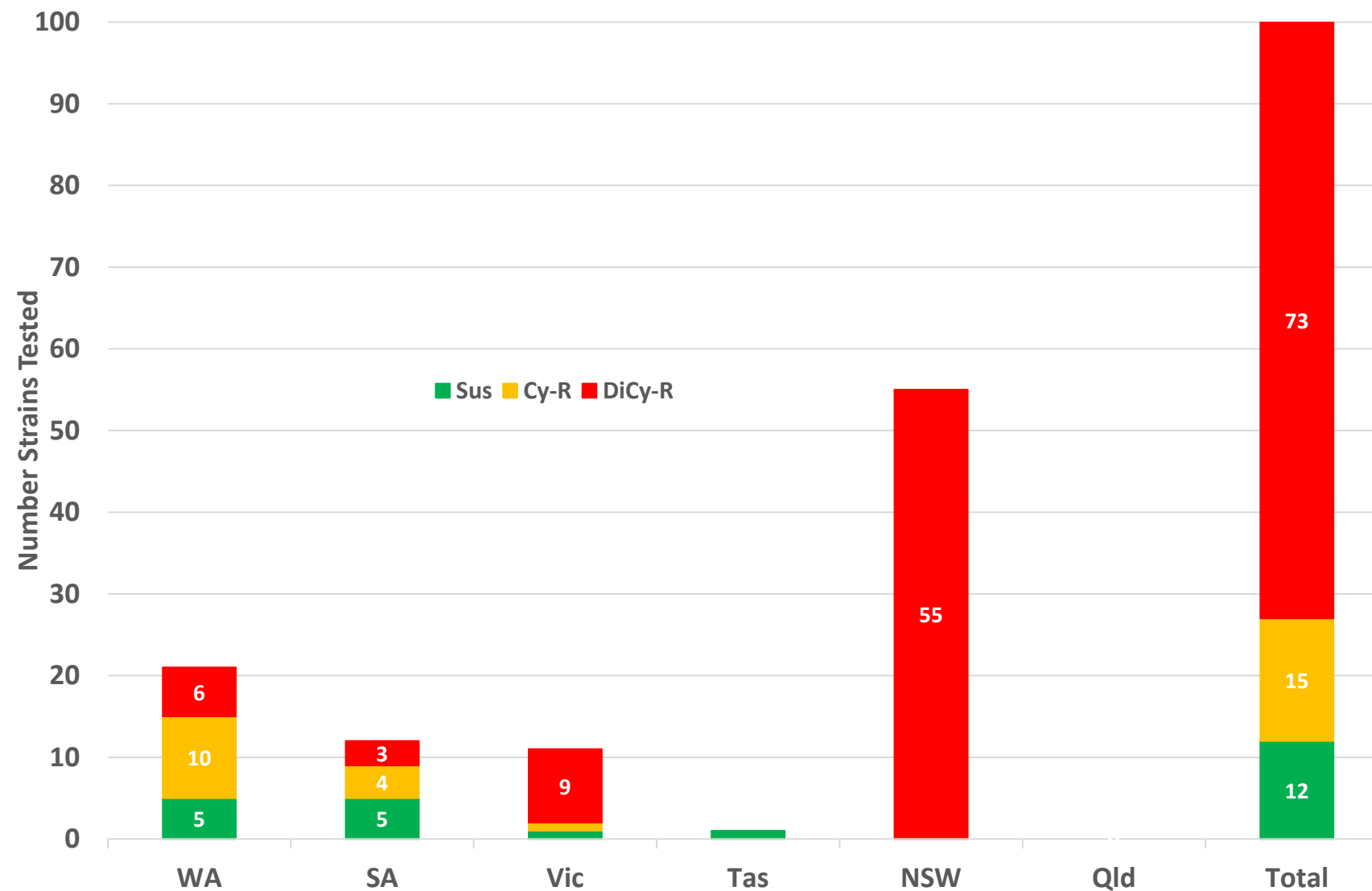
Australia total:  
63.5 million (-3%)



## 2018-2020 Project - Registered Insecticides for Flystrike Prevention and Control

N°	Chemical Group	Chemical Name	Example Product	Application Technique	Protection -Label Claim	Used against Lice	Resistance ?	
1	Organophosphate (OPs)	<u>Diazinon</u>	Coopers® Diazinon	Dressing	-	Yes Temephos (Coopers® Assassin) Dip	YES	✓
		Propetamphos	Young's DeadMag®	Dressing	-			
		Chlorfenvinphos	Defiance S®	Dressing	-			
2	Insect Growth Regulators (IGRs)	<u>Cyromazine</u>	Vetrazin®	Spray-on Jetting	Up to 11 weeks Up to 14 weeks	NO	YES	✓
		<u>Dicyclanil</u>	Clikzin® Clik® ClikExtra®	Spray-on	Up to 11 weeks Up to 18-24 weeks Up to 29 weeks	NO	YES	✓
3	Macrocyclic Lactone (MLs)	<u>Ivermectin</u>	Coopers® Blowfly and Lice	Jetting/Dip Dressing	Up to 12 weeks	YES	NO	✓
4	Spinosyn	<u>Spinosad</u>	Extinosad Eliminator™ Extinosad™	Jetting/Dip Dressing Aerosol	Up to 4-6 weeks -	YES	NO	✓
5	Neonicotinoid	<u>Imidacloprid</u>	Avenge + Fly®	Spray-on	Up to 14 weeks	YES	NO	✓
6	Synthetic Pyrethroid (SPs)	α- Cypermethrin	Vanquish®	Spray-on	Up to 10 weeks	YES	NO	✗

## 2018-2020 Project - Cyromazine and Dicyclanil Resistance Status by State



## 2018-2020 Project - Highest Levels of Associations between Insecticides by Cyromazine and Dicyclanil Resistance Status.

<i>Strains</i>	<i>Insecticide 1</i>	<i>Insecticide 2</i>	<i>Pearson's Coefficient (r value)</i>	<i>Significance (p &lt;0.05)</i>	<i>n</i>
<i>D&amp;C Susceptible</i>	Imidacloprid	Diazinon	0.64	0.009525	12
<i>Cyromazine R only</i>	Imidacloprid	Ivermectin	<b>0.87</b>	<b>0.000019</b>	<b>15</b>
<i>Dicyclanil R - Low</i>	Imidacloprid	Ivermectin	0.59	0.02178	25
<i>Dicyclanil R - Med</i>	Ivermectin	Diazinon	0.54	0.0142	20
<i>Dicyclanil R - High</i>	Imidacloprid	Spinosad	0.45	0.0150	28
<i>Dicyclanil R -ALL</i>	Imidacloprid	Diazinon	0.41	0.0003	73
<i>ALL Strains</i>	Imidacloprid	Diazinon	0.53	0.0418	100

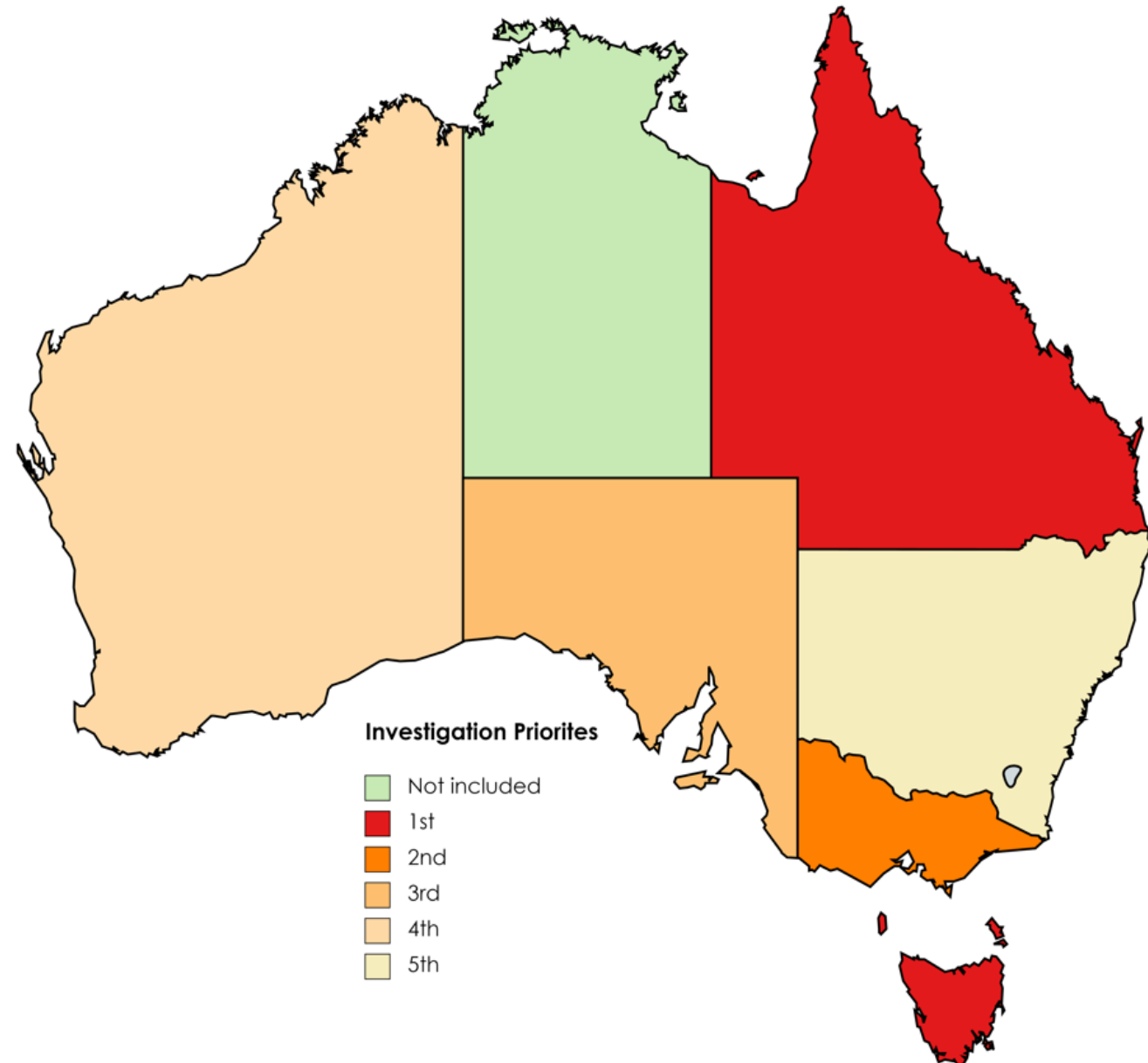
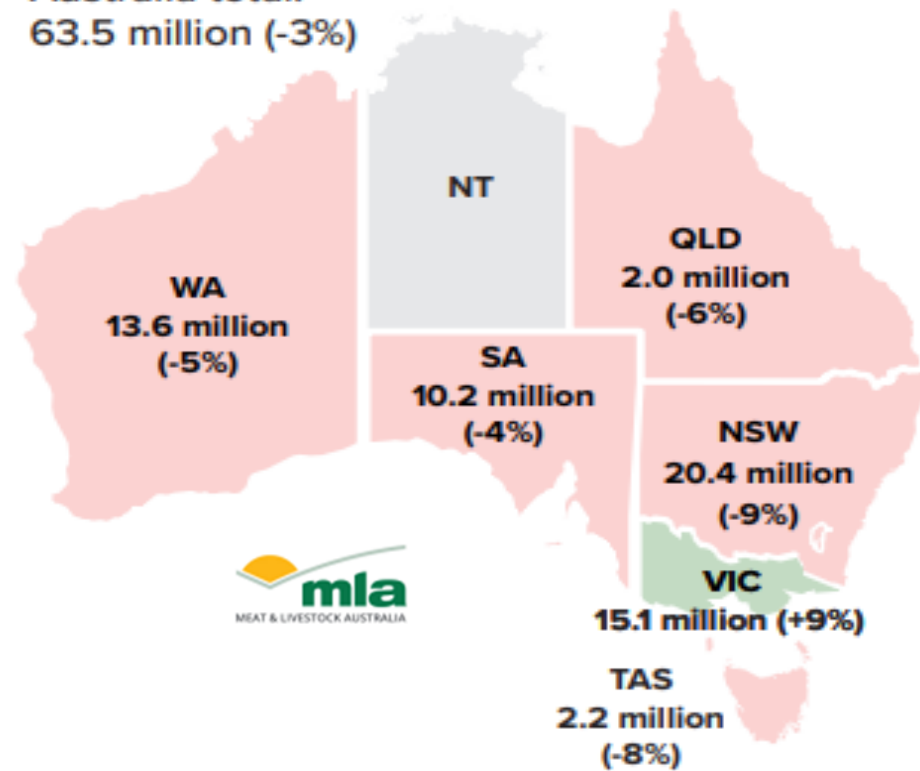
The Pearson product-moment correlation coefficients calculated to determine associations between the susceptibility of strains to two insecticides. Results supplied for p<0.05.

**0 < r < 1** as r becomes less than 1 the data is less well represented by a single linear relationship.

## 2022-2024 Project – Investigation Priority by State

### Sheep changes by state 2019–20 on 2018–19

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## Summary – Information required

- **Information Gaps**
  - **Targeting** underrepresented states, regions and areas for submissions
    - **Determine** the presence and level of resistance
  - **Multi resistance or associations between insecticides –**
    - **Determine** toxicological response of strains to each insecticide group.
    - **Increase representation of** susceptible and cyromazine-only resistant strains.
- **History of insecticide usage and the development of resistance – (UoM Gene flow)**
  - **Metadata collection** (UTAS Modelling validation and forecasting).
- ***In vitro* investigation and effects on resistance of:**
  - **Mixtures** as commonly used in drenches – (also in UTAS Modelling)
  - **Best practice** – dressing (chemical group A) followed by prophylactic treatment (chemical group B)



Source: iStock

**Informed Integrated Resistance Management and Advice  
Based on Data and Modelling**



This publication is based on information presented at the Australian Wool Innovation Limited (AWI) Flystrike RD&E Technical Forum held on 10th August 2022. Some information in this publication has been contributed by one or more third parties and licenced to AWI, and AWI has not verified whether this information is correct. This publication should only be used as a general aid and is not a substitute for specific advice. To the extent permitted by law, we exclude all liability for loss or damage arising from the use of the information in this publication. Except to the extent permitted under Copyright Law no part of this publication may be reproduced by any process, electronic or otherwise without the specific written permission of AWI. Neither may information be stored electronically in any form whatsoever without such permission. AWI is grateful for its funding, which is primarily provided by Australian woolgrowers through a wool levy and by the Australian Government which provides a matching contribution for eligible R&D activities. © 2022 Australian Wool Innovation Limited. All rights reserved.