# Challenges with Managing insecticide resistance in UK pests

Steve Foster

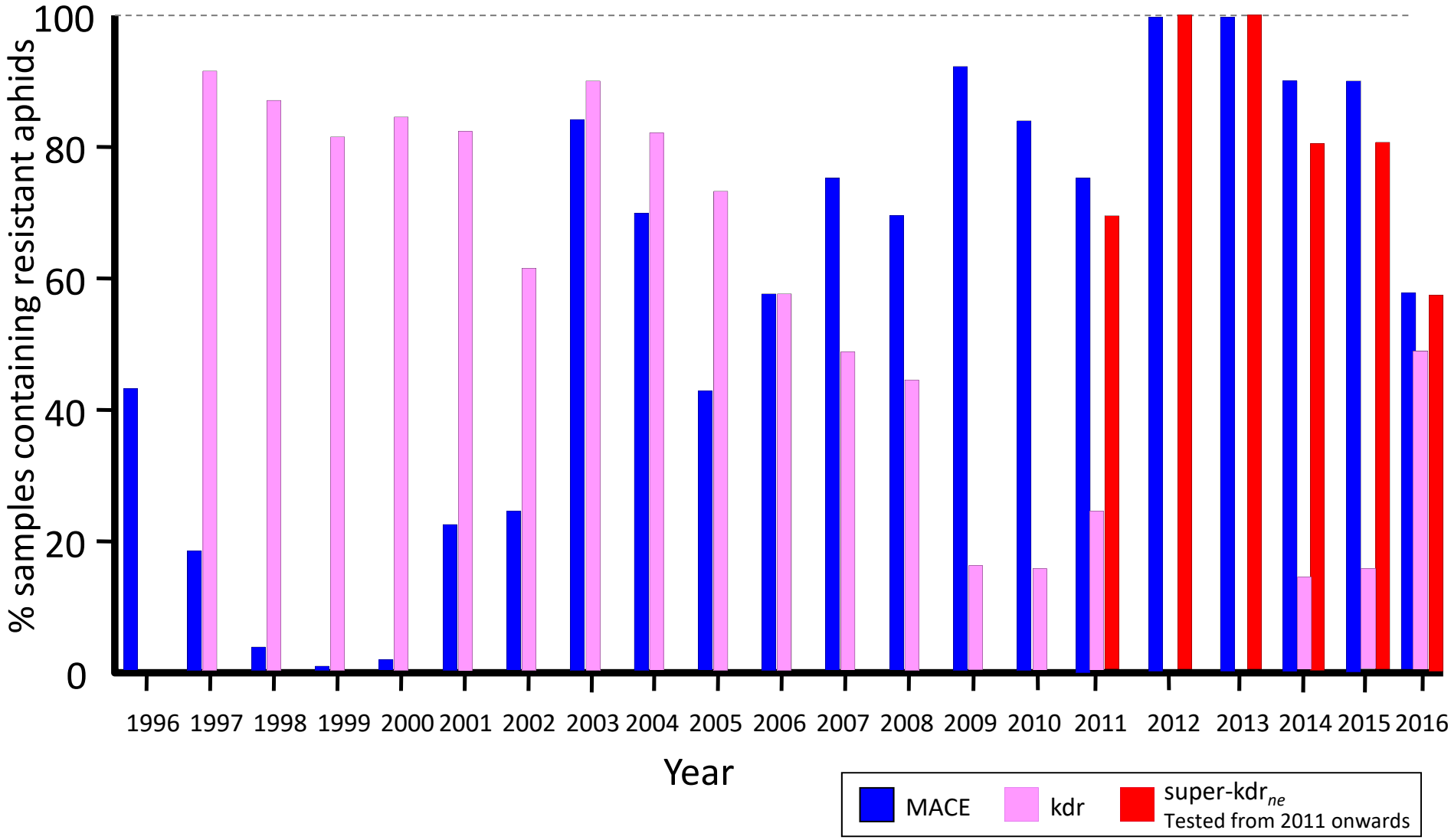
Rothamsted Research


Peach-potato aphid
Myzus persicae

**MACE (pirimicarb)**

**kdr and super-kdr (pyrethroids)**

# *Myzus persicae* field samples containing MACE, kdr and super-kdr$_{ne}$ aphids



# Loss of Pirimicarb

Cambridge, CB21 5XE
UK
www.syngenta.co.uk/vegetables

January 2016

**Important Aphox Changes**

We are writing regarding the important changes for Aphox (Pirimicarb) that should be immediately considered by you for this season. Syngenta wish to expand and provide you with detail regarding label changes during re-registration. This season there will be two MAPP numbers in the market (old and new). Therefore there are different aspects for you to consider, dependent upon the MAPP number.

**MAPP number 10515** (old label)

The European Food Safety Authority (EFSA) has reviewed the Maximum Residue Levels (MRLs) currently established at European level for the pesticide active substance pirimicarb. We anticipate this will be voted on in the first quarter of 2016, and is likely come in to force. Should it come in to force, the MRLs for the below crops would drop to the limit of determination.

Syngenta has been verbally advised by CRD that should the anticipated changes come in to force, a 6 month use up period for the below crops would likely be given. However, this is yet to be announced. In practical terms such a period would typically enable growers to use up product in their stores. Aphox could then be applied to the below crops during the use up period and prior to the updated MRLs coming into force.

However, should Aphox be applied after any such transition period (or prior if no transition period is given), there is a significant risk that the (new) MRLs would be exceeded.

As a result, despite being permitted by this label, we recommend that growers carefully consider prior to applying Aphox (Pirimicarb) to the following crops.

- Brassicas: Cauliflower, Broccoli, Chinese Cabbage, Kale and Cabbage
- All Fruit
- Sweetcorn
- Protected lettuce

**Note:** Crops remaining on the label for **MAPP 10515** may only receive one application of Aphox. Always follow label requirements.

**MAPP number 17401** (new label)

All new product delivered to channel by Syngenta in 2016 will be under this label and have the following crops only. As the crops are different, the MRL issue outlined above in relation to MAPP 10515 is not relevant for use of this product. Always follow label requirements.

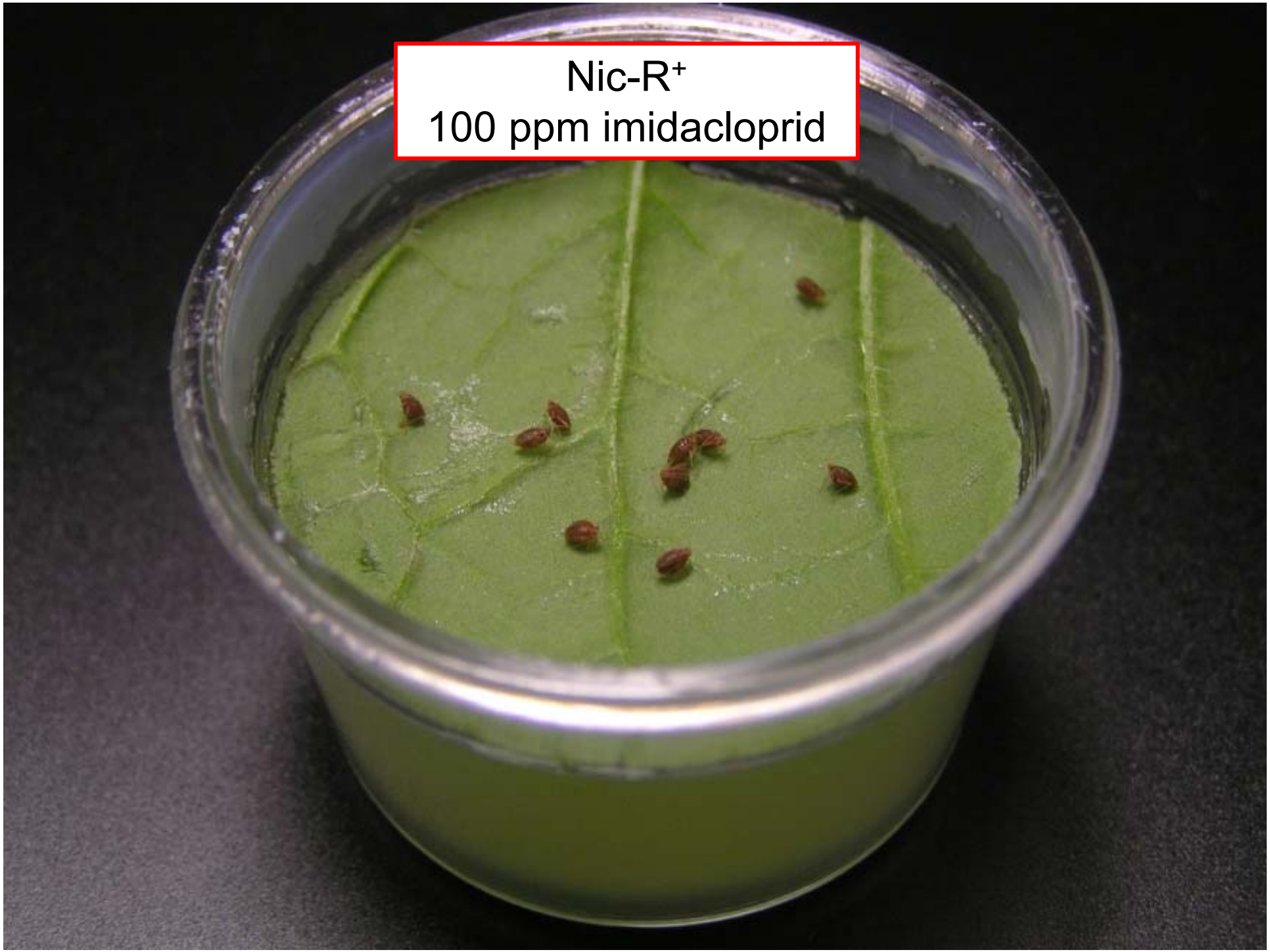
| Crops | Maximum individual dose (g product/ha). | Maximum Number of Treatments | Latest time of application. (days before harvest) |
|---|---|---|---|
| Broad bean - fresh | 280 | 1 | 3 |
| Vining pea | 280 | 1 | 7 |
| Combining pea & field bean | 280 | 1 | 14 |

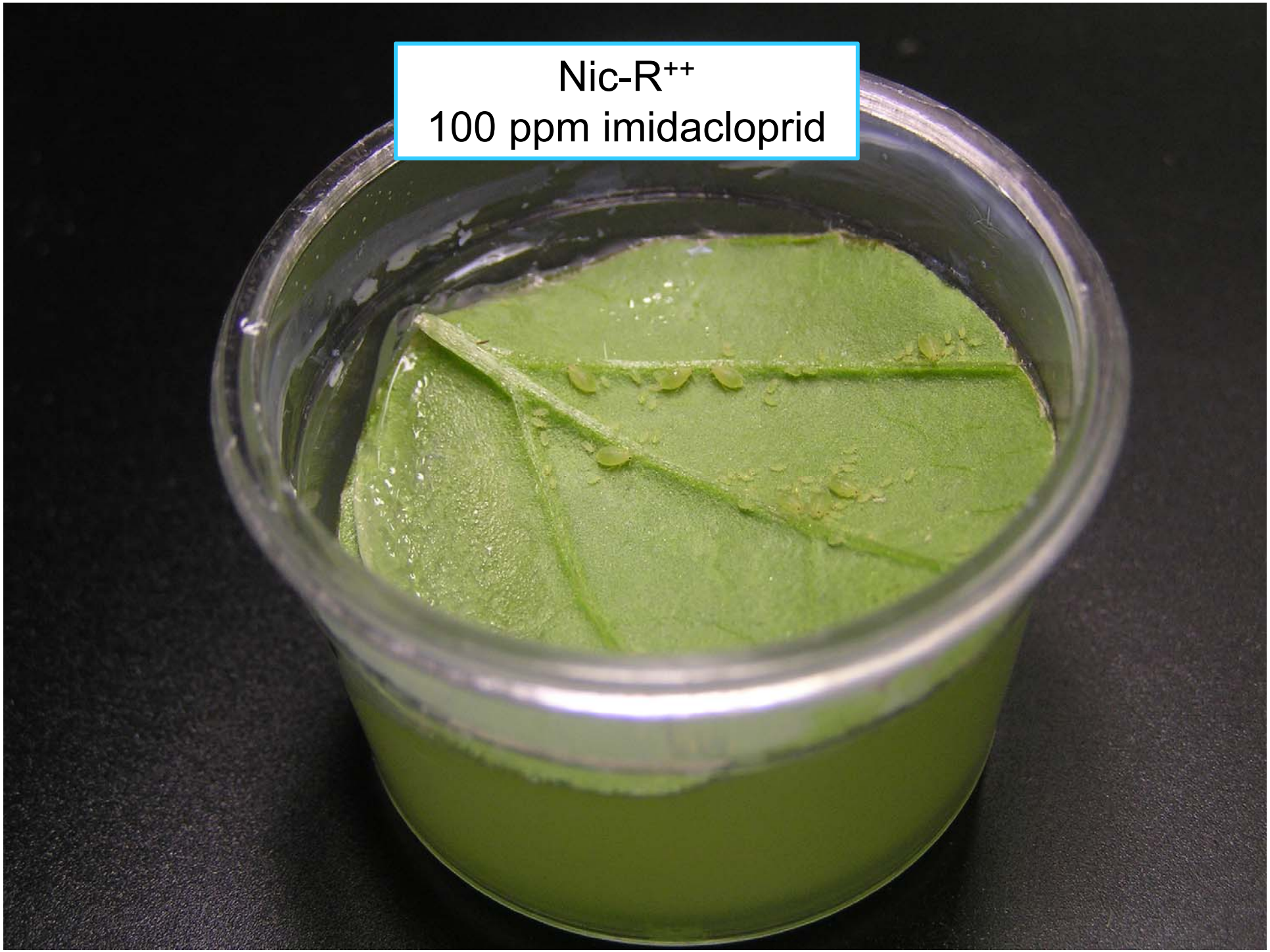
If you require any further clarification please contact myself or your Syngenta representative.
**Rebecca Stilton - Campaign Manager – Vegetables and Insecticides**

# Response to neonicotinoids

# Neonicotinoid Resistance Categories

| | |
|---|---|
| Nic-S | Susceptible |
| Nic-R | Low resistance |
| Nic-$R^{+}$ | Moderate resistance |
| Nic-$R^{++}$ | Strong resistance |


Nic-R+
100 ppm imidacloprid


Nic-R++
100 ppm imidacloprid

## % of English *Myzus persicae* field samples containing aphids with low (Nic-R) neonicotinoid resistance

**The good news continues..**
**No Nic-R$^{+}$ or Nic-R$^{++}$ found**

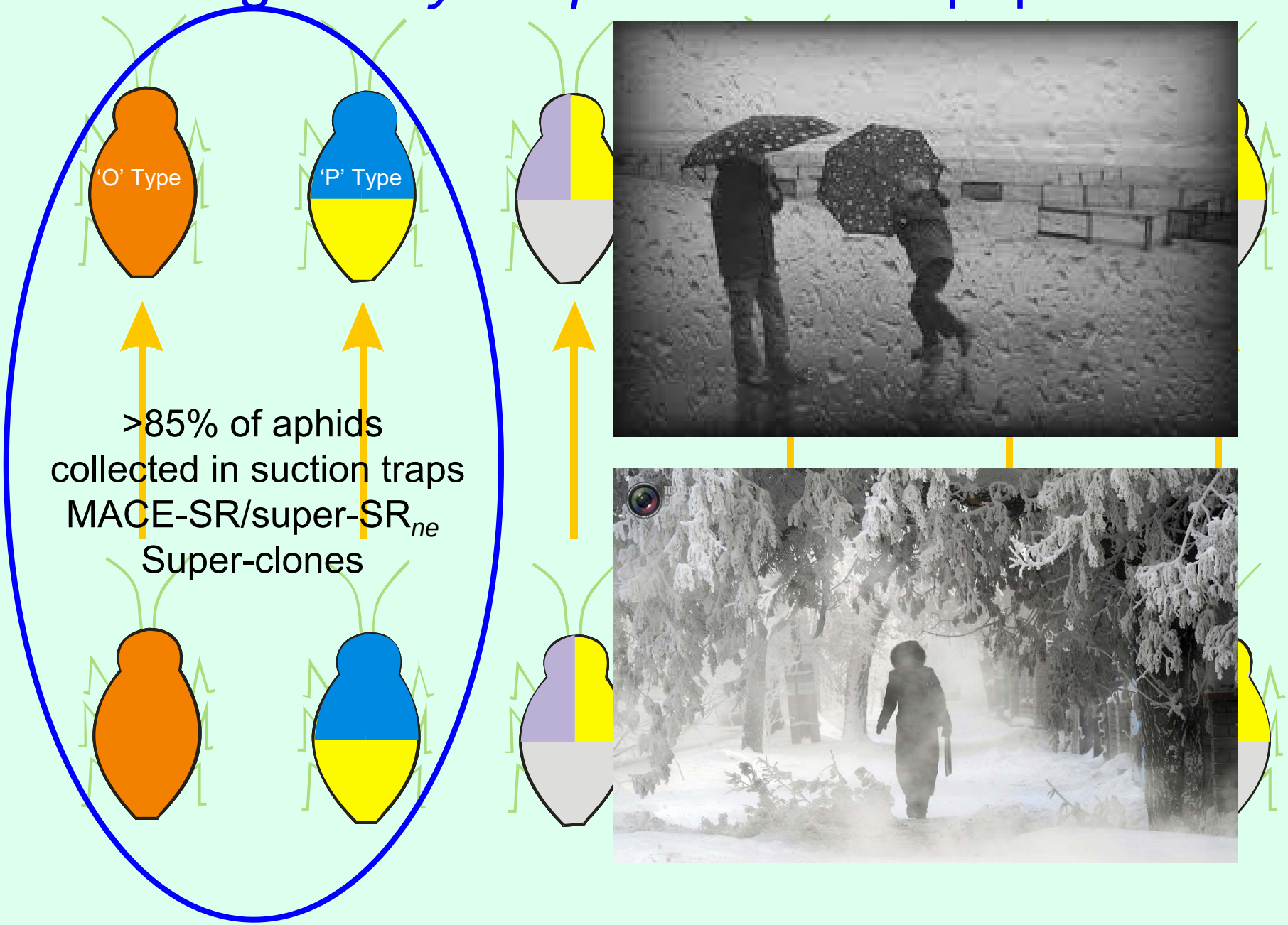

EU restriction on neonicotinoid seed treatments
Initially from December 2013 to December 2015
Now extended…..

GIVE BEES A CHANCE
No GMOs, no pesticides

# English suction trap sites


http://www.rothamsted.ac.uk/insect-survey/STTrapSites.php

# English *Myzus persicae* field population

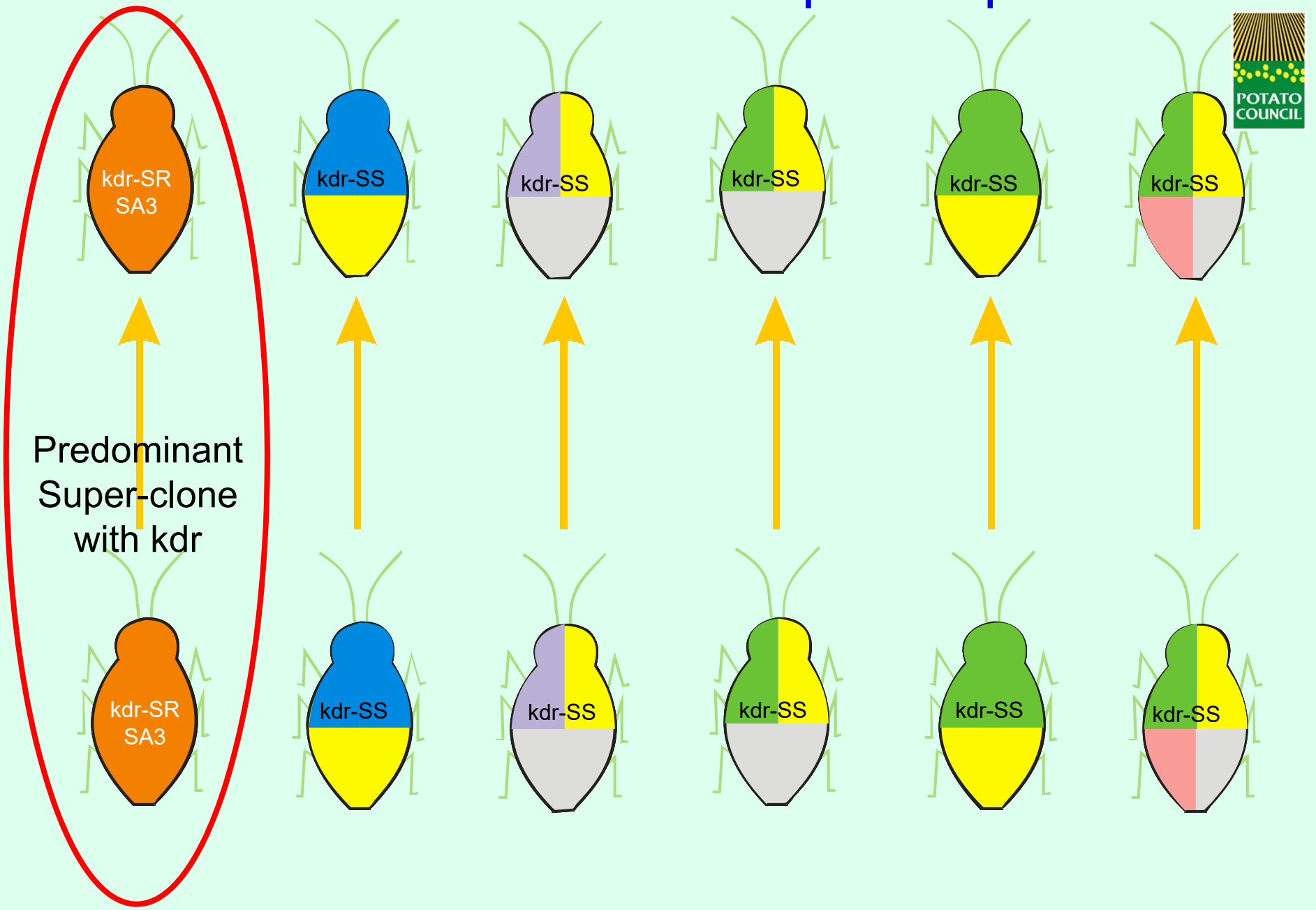


# *Myzus persicae* samples collected from Field vs Protected crops


Grain aphid,
*Sitobion avenae*

# Diversity/clonal nature of UK *Sitobion avenae* population?

# *Sitobion avenae* asexual aphid reproduction



# *Sitobion avenae* 2016 sample from Forfar in Scotland

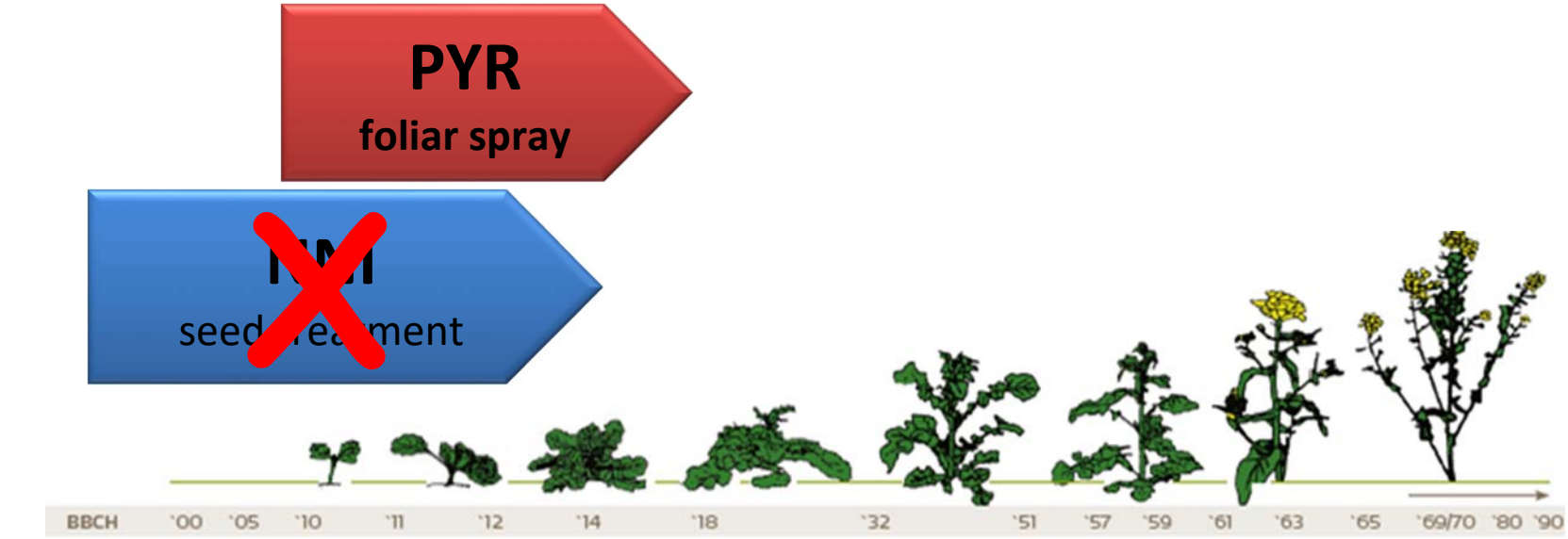
**“We are seeing some issues with grain aphids that are resistant to pyrethroids this Autumn. I have a grower who sprayed some early-sown winter barley and wheat soon after emergence to control aphids. I am assuming that we have a resistant population present.**

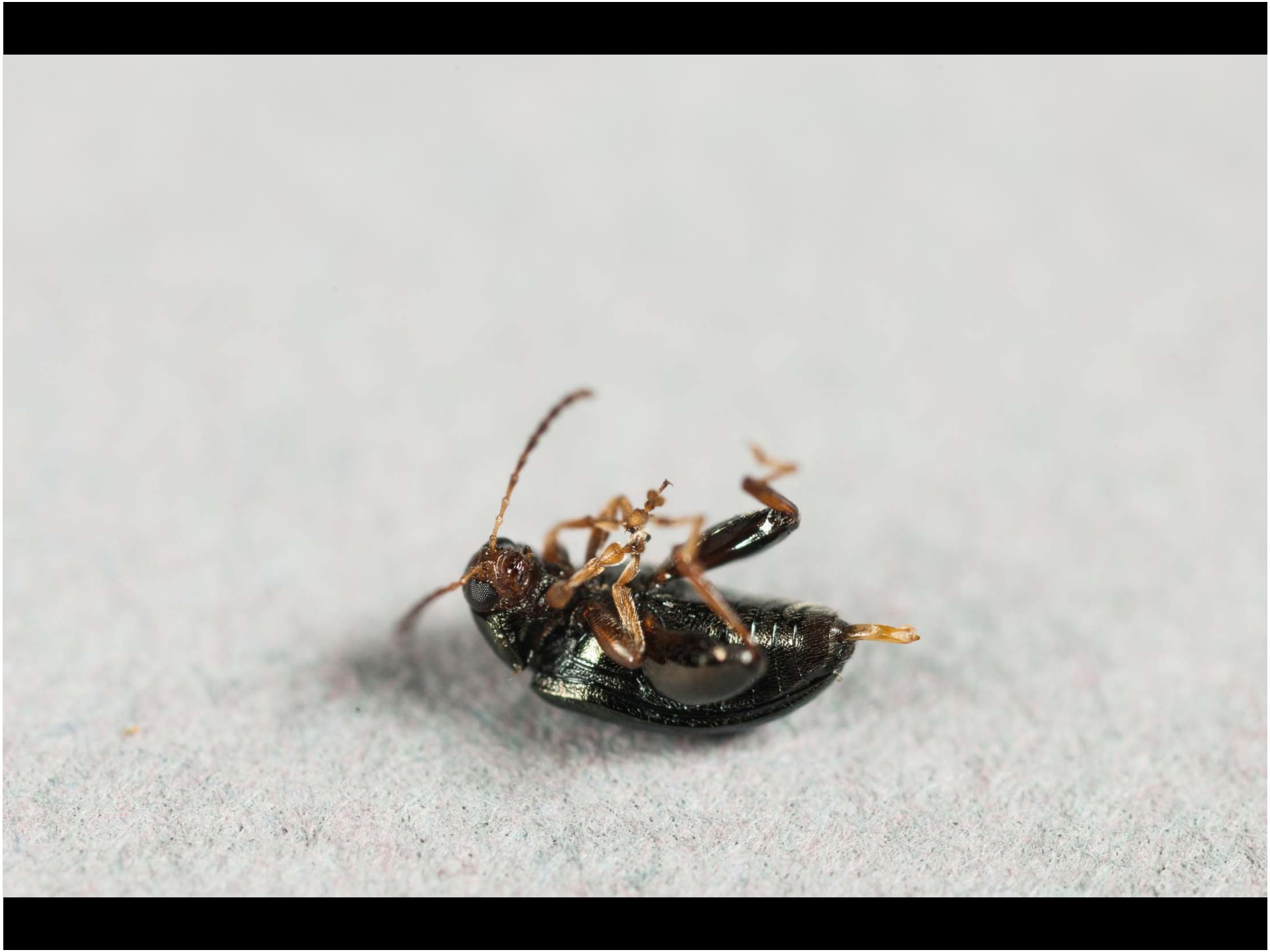
**kdr-SRs present**

**Sprayed with 30 mls Hallmark Zeon (60% rate)**

# Cabbage stem flea beetle (***Psylliodes chrysocephala***)
## Adult damage

# Management options (autumn 2014 onwards)



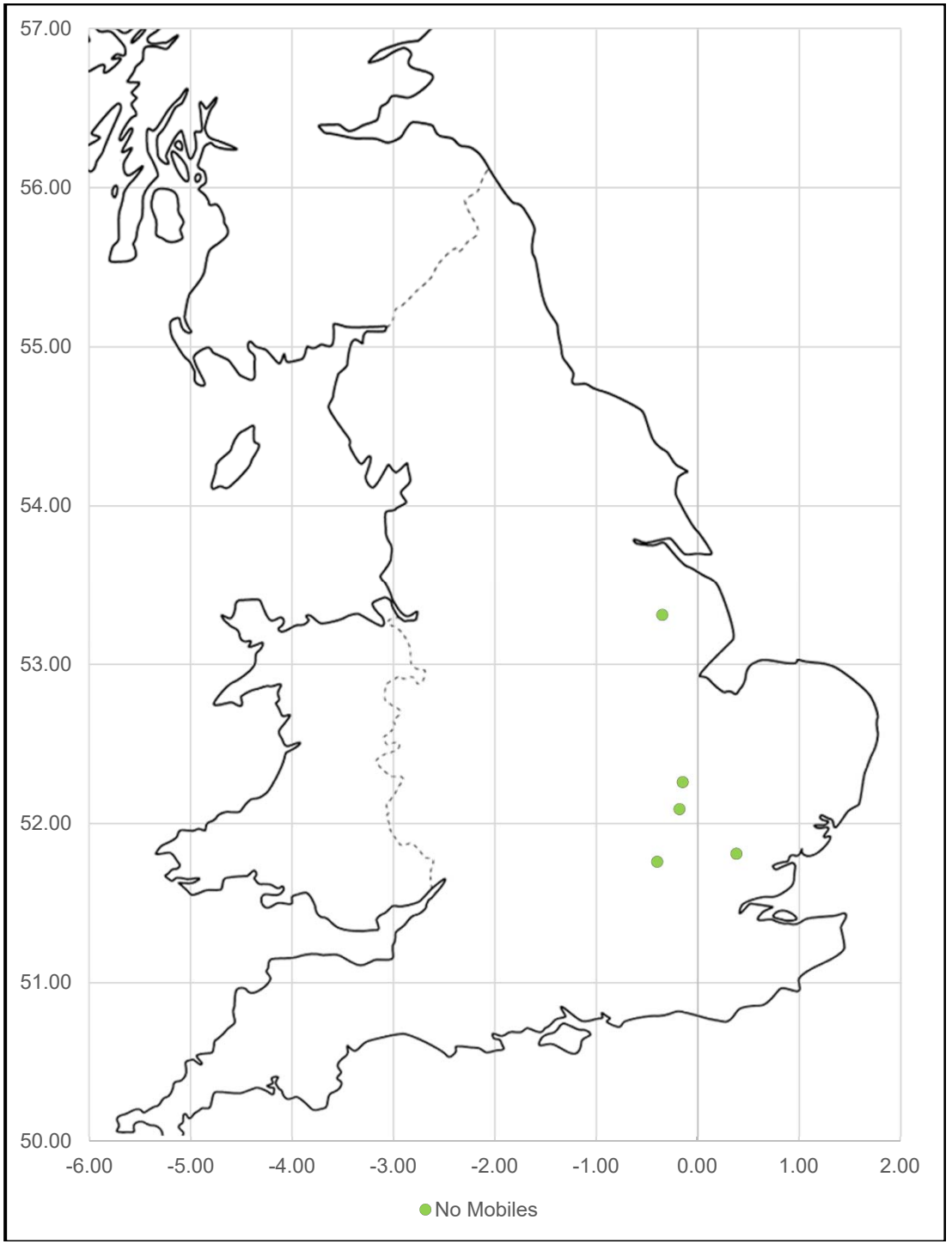



"Play dead….make them think
that their pyrethroid sprays are working…"

# Resistance to lambda-cyhalothrin (7.5 g ai/ha) in CSFB samples (2016)

Response to field rate

- 0% resistant beetles
- >0%-50% resistant beetles
- >50% resistant beetles



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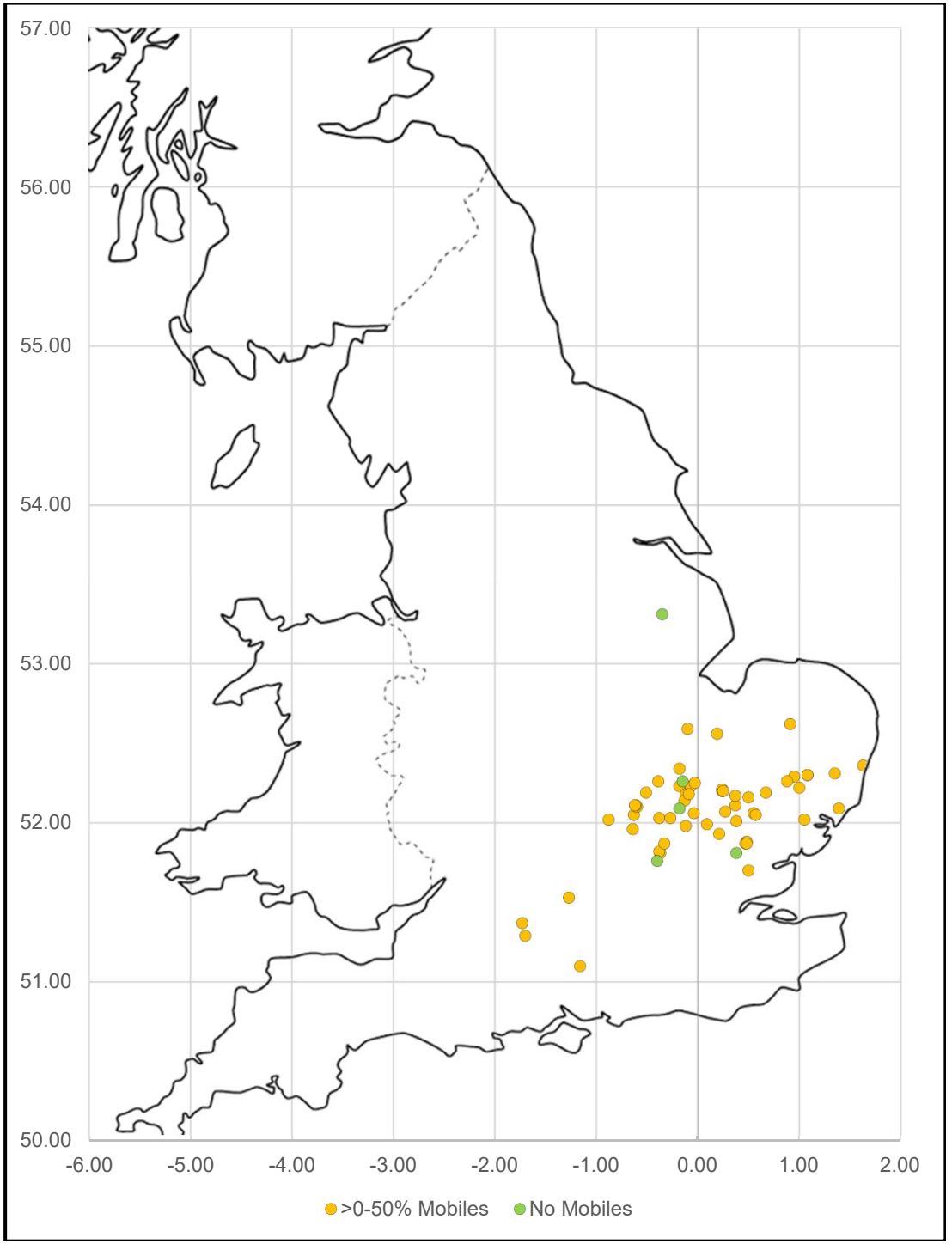

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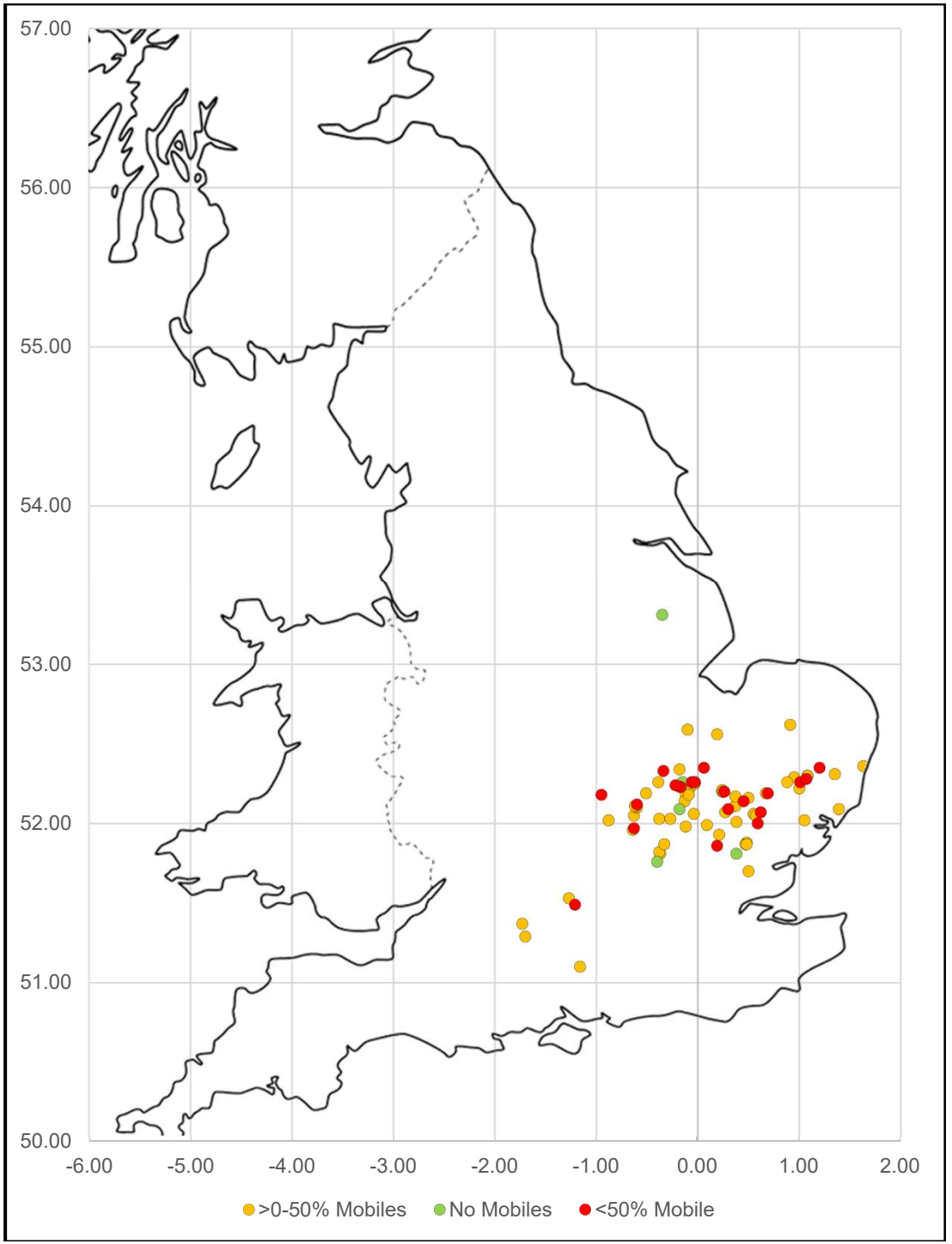
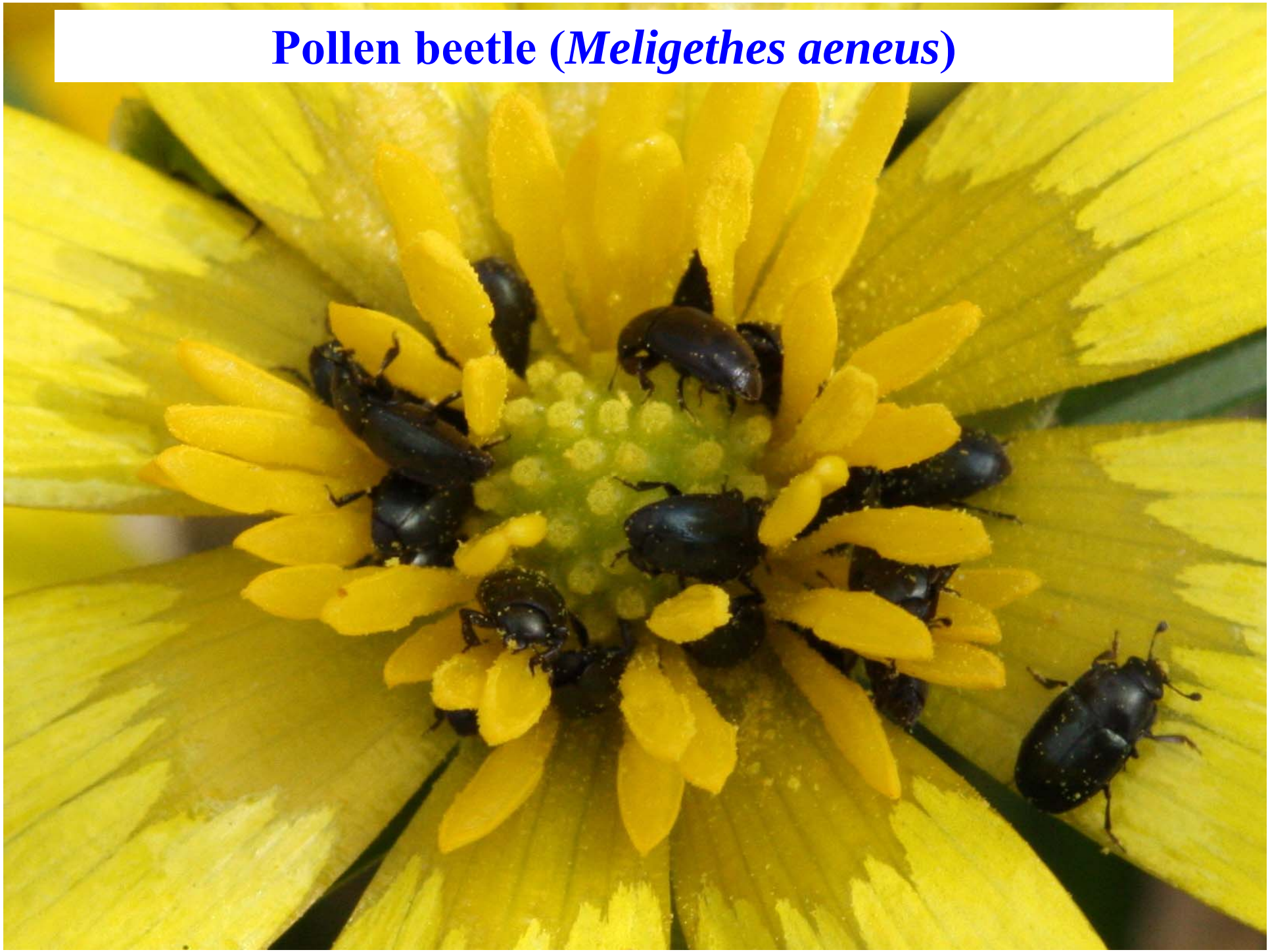


# Pea and bean weevil

## *Sitona lineatus*

# Pollen beetle (*Meligethes aeneus*)



# Diamond back moth (***Plutella xylostella***)

Curtesy, Mark Mallott

# UK *Plutella xylostella* samples (2016)

*Px1* (30 adults, Great Saxam, Suffolk). Collected 14/6/16 (Alan Dewar, Dewar Crop Protection).

*Px2* (Eggs/larvae on leaves, Kirton, Lincs). Collected 11/7/16 (Simon Jackson, Allium and Brassica Agronomy Ltd.).

*Px1* (Eggs/larvae on leaves, St Monans, East Fife). Collected 28/6/16 (Jeff Layton, Kettle Produce).

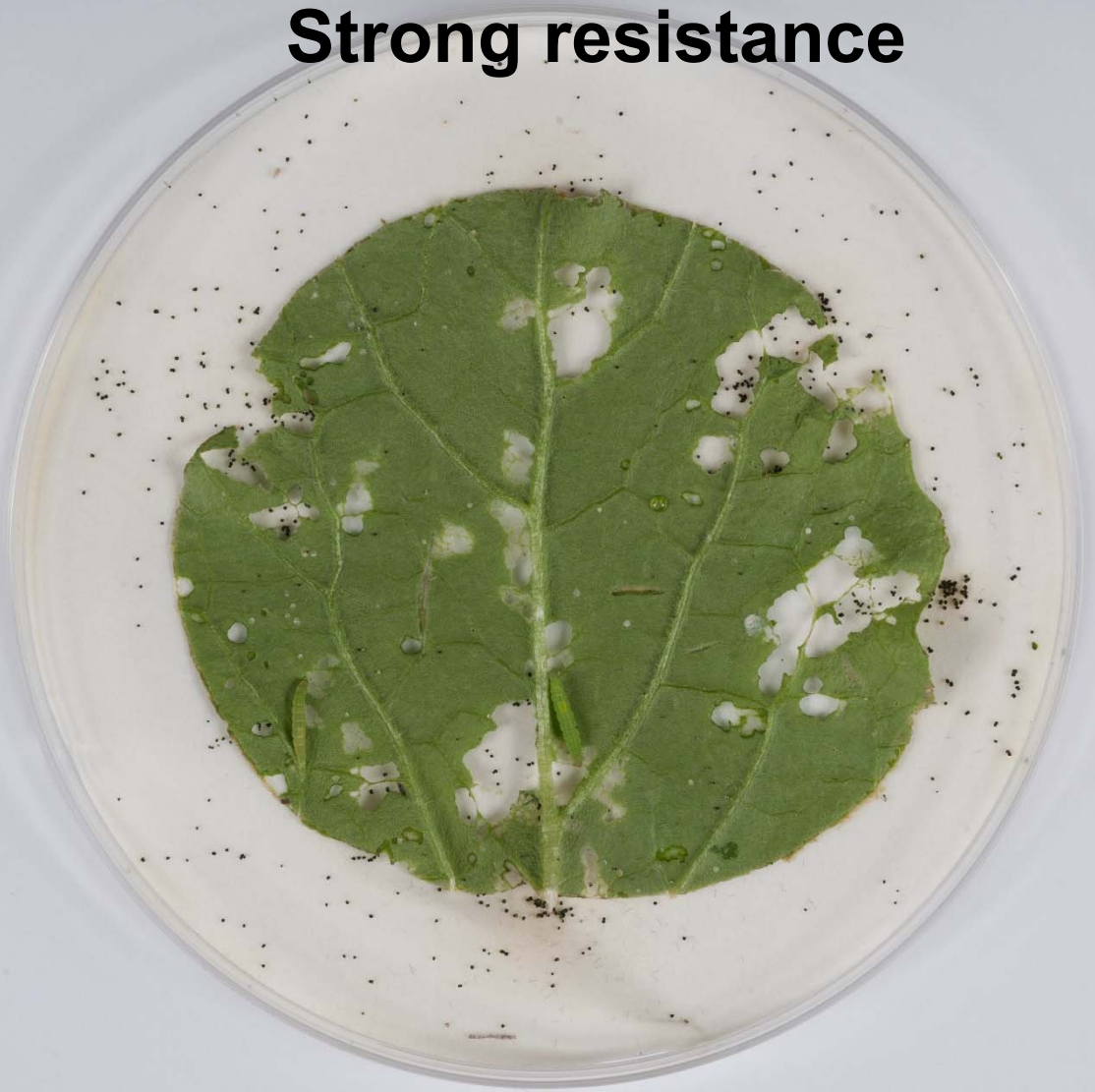
Pyrethroid resistance.
No resistance to diamides or spinosad.

# Leaf-dip bioassays exposing L2 larvae to insecticides

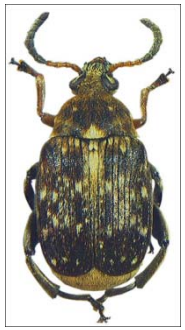
# No resistance

# Some resistance

# Strong resistance



# Other pests where pyrethroid resistance is looming?



**Bruchid Beetle**
***Bruchus rufimanus***

**Grain Weevil**
***Sitophilus granarius***

**Saw-toothed Grain beetle**
***Oryzaephilus surinamensis***

**Seed Weevil**
***Ceutorhynchus assimils***

**Striped Flea Beetle**
***Phyllotreta striolat***


Di Cox
Mark Mallott
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