



Alfalfa Leafcutting Bees In Southern Alberta

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Introductions

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Presentation Outline

- Leafcutting Bee Introduction
- Canadian Cocoon Test Centre
- Chemical Parasite Control
- Alternative Parasite Control (Spices)
- Forecasted Bee Prices

Have you seen these structures?



Or maybe these?



These Are Shelters For Alfalfa Leafcutting Bees



THAT'S NOT
ALFALFA!





Leafcutter Bees Help Make Hamburgers



What's Going On Behind The Scene?



Canadian Cocoon Test Centre

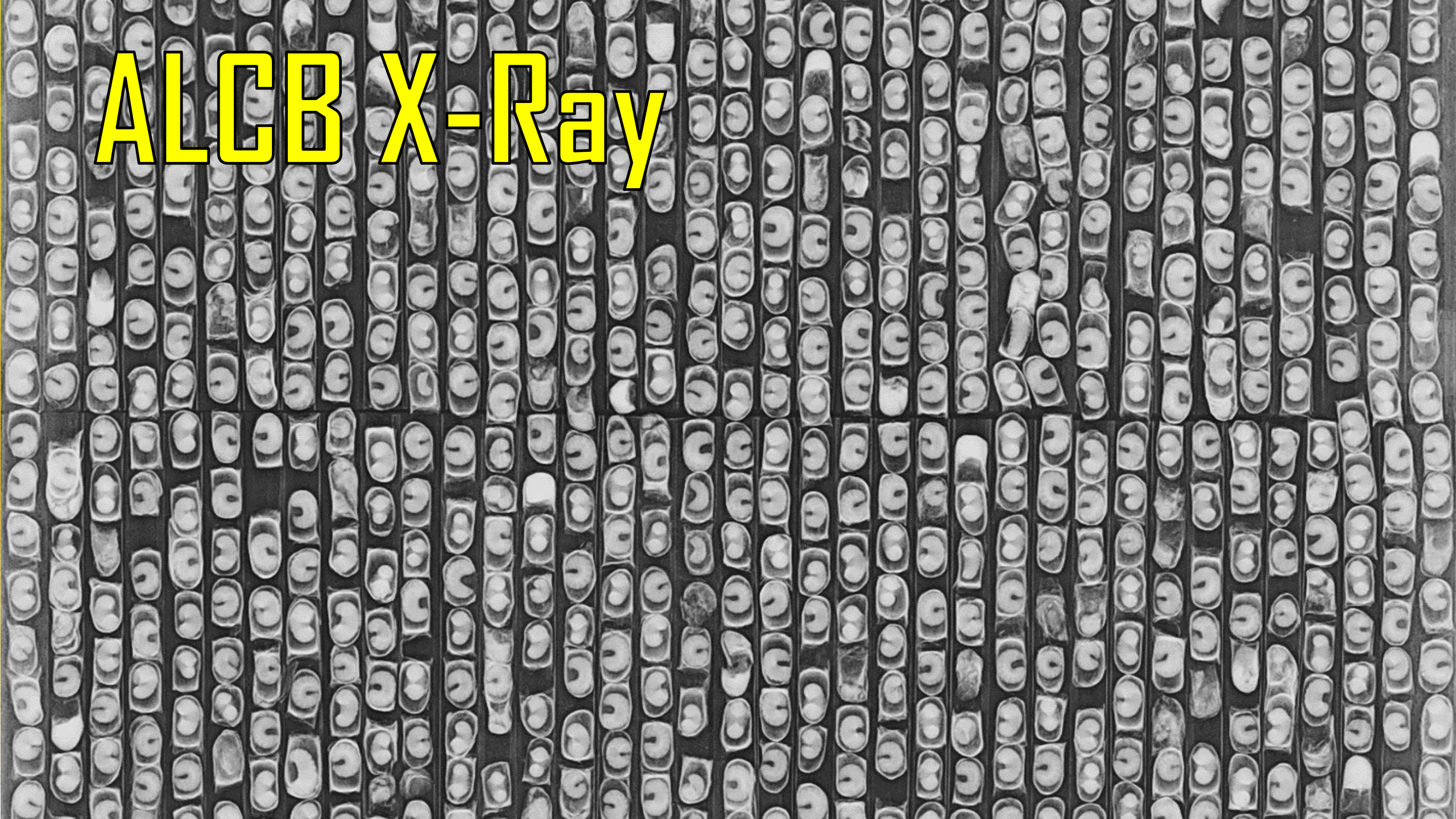


Leafcutting Bee X-Ray Machine

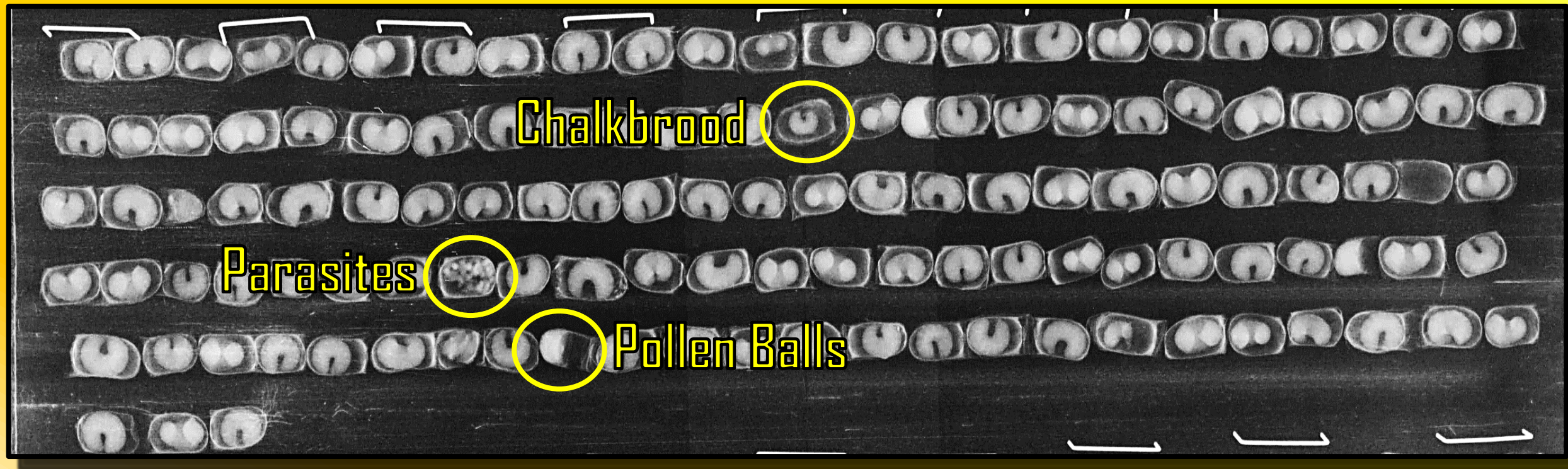




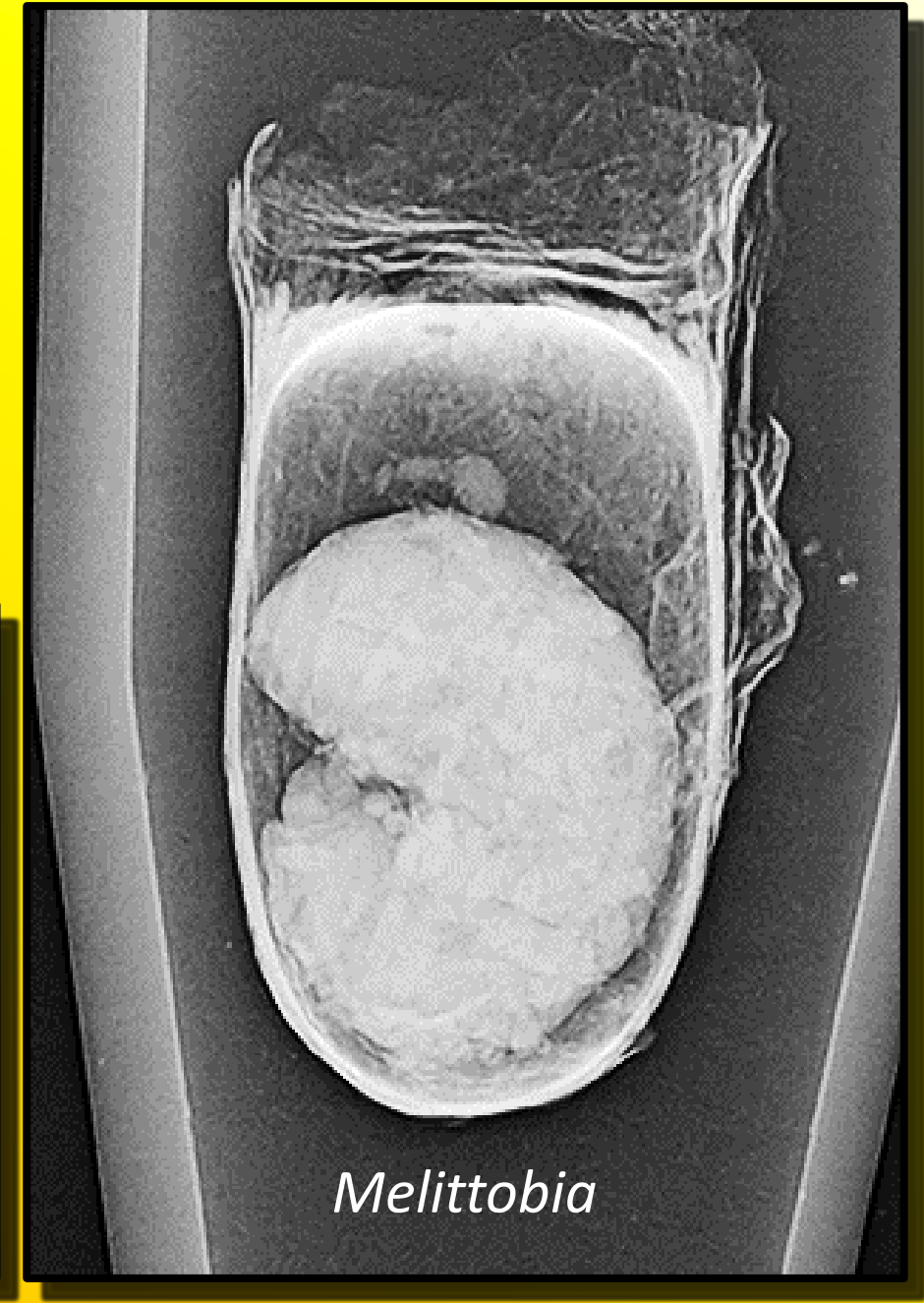
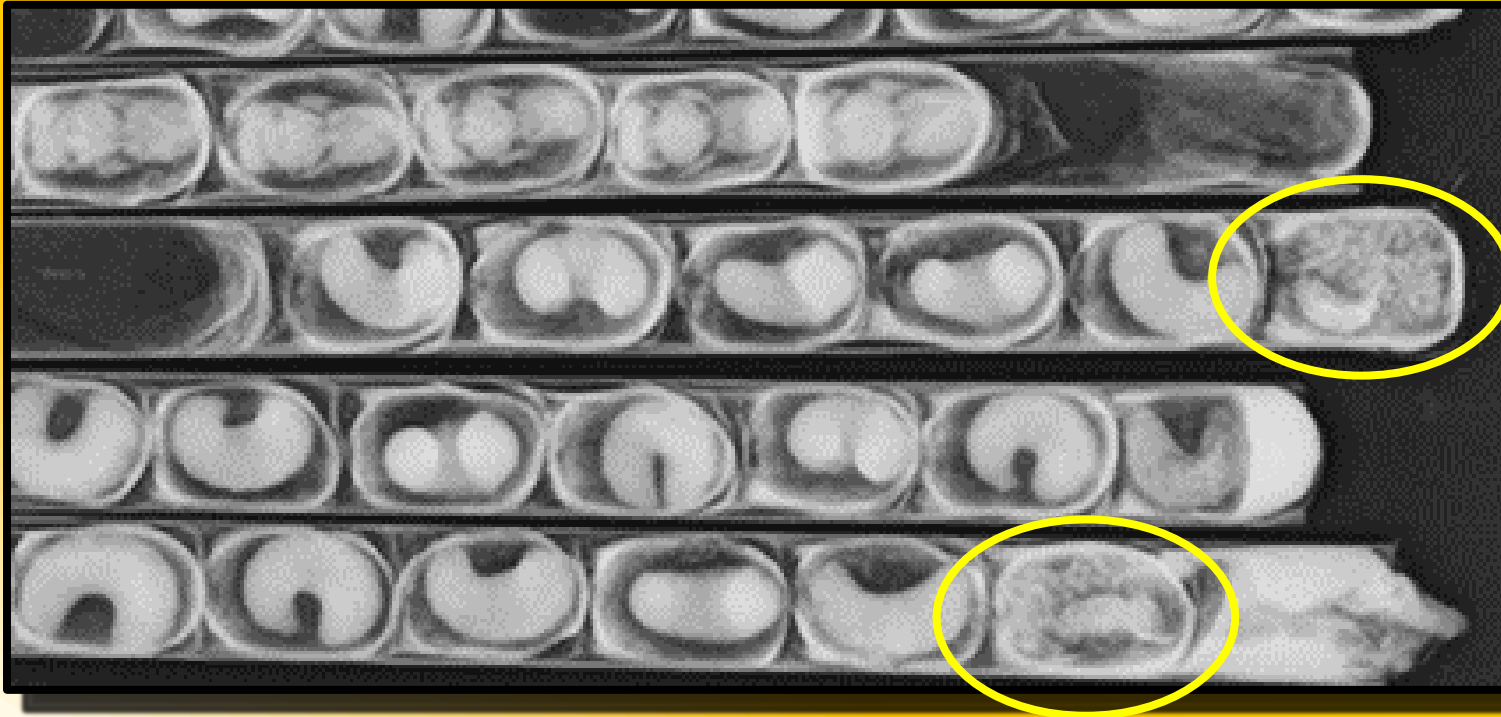
ALCB X-Ray



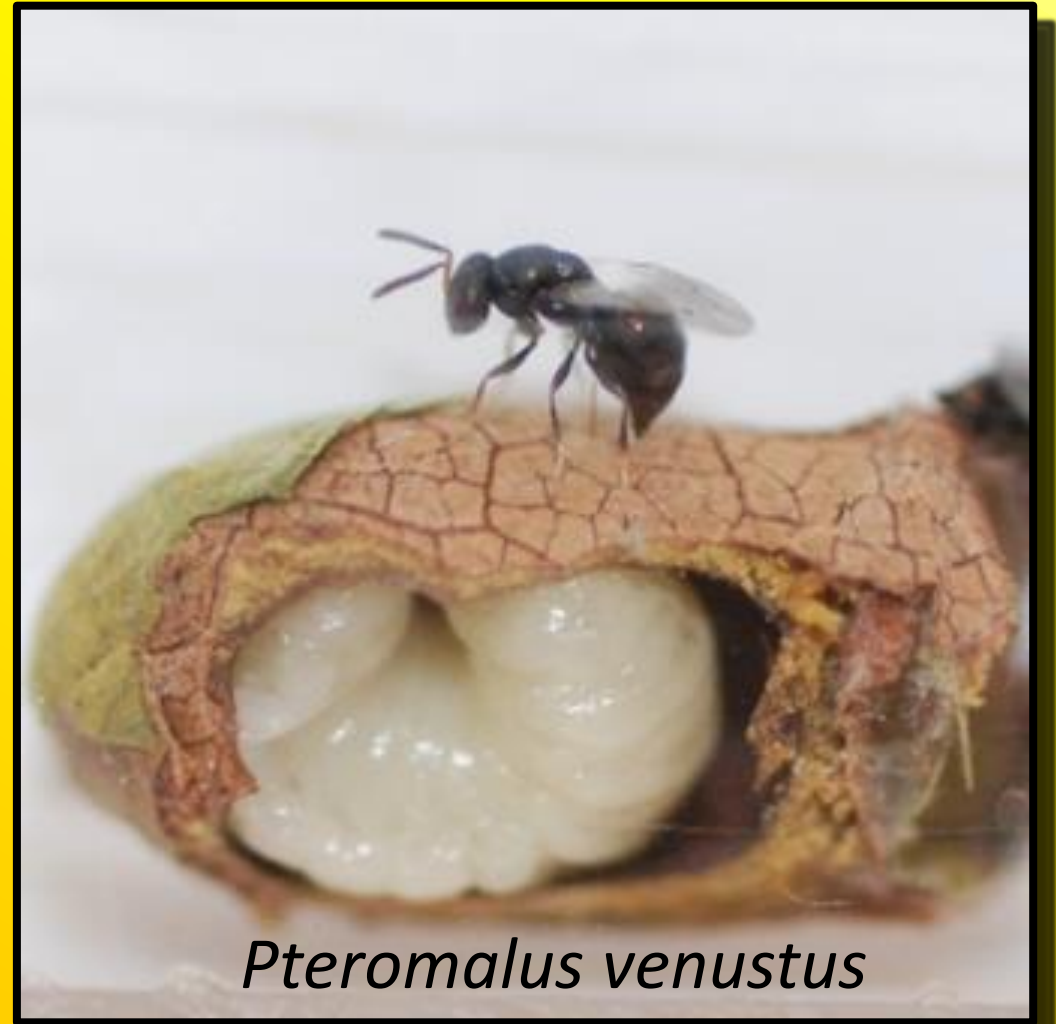
Assessing Bee Health & Quality



Monitoring New Threats



Parasite Research



Pteromalus venustus

Dichlorvos (Vapona)

- Uncontrolled parasites can cause devastating bee loss in incubation
- Dichlorvos is the most commonly used control option. Just hang & go.
- This must be carefully timed to kill the parasites without harming the bees
- Some bee loss is still likely (~20%)



Field Readings

- I used a MiniRae3000 VOC monitor detect the dispersal of Dichlorvos.
- I tested high, low, in the corners, between the trays, next to the light traps etc.



The Strips Are Not Standardized

- Many were off-gassing half as much as others, and some were completely undetectable. (In the same incubator)
- I tested this further by opening three “new” strips.
 - All three were emitting Dichlorvos at different amounts.

1 = 4.0ppm

2 = 2.3ppm

3 = 3.3ppm

- 2.3 is almost half of 4.0 and that will make a big difference when applied to a large area.

Manufacturing Date

- This is what Scotts told me:

- The strips only have a shelf life of 5 years,
- Over this time they slowly lose potency,
- There may be big differences between boxes depending on the manufacturing date.
- Check the manufacturing date on the side of the box then add five years. (The foil does not have a date)
 - Not all boxes have a date either



Do Not Reuse Strips

- At room temperature (~21°C), the strips last for Max 4 months after opening.
- Incubators are much warmer, causing Dichlorvos to volatilize more quickly.
- Even if the strips have a smell this doesn't mean there's any chemical left.

DIRECTIONS FOR USE:

This package contains one resin vaporizer strip impregnated with dichlorvos insecticide, in a sealed pouch to prevent vapour loss. For use, remove the strip from the pouch and suspend with the accompanying hook in an enclosed space of up to 30 cubic metres. The strip gives off a **virtually odourless** insecticidal vapour which will provide control of flies, mosquitoes and other small flying insects for up to four months. The strip is NOT designed to repel or kill insects instantly. Allow free air movement but hang strips away from open windows and doors where excessive ventilation may reduce efficiency. Strips should be at least 3 metres apart.

Put it Where They're Going

- There's a chemical gradient that increases as you approach the clips.
- The levels also increasing as you rise in height.
 - Meaning there's often less Vapona on the floor where the light traps are.
- There's an increase in parasitism as you approach the light traps (Dr. Baines)
 - To help with this ***hang a clip with each light trap***



Good Ventilation



The air in these incubators was mixing with the air in the shop and unintentionally exposing workers.

Maintain good ventilation in any work spaces attached to incubators

Alternative Parasite Control (Spices)

- In 2016 Wayne Goerzen (SK) identified clove oil as a *Pteromalus* repellent
- Following this, I applied fresh spices directly to the cocoons in incubation
- Cloves looked promising initially but were far too costly



Alternative Parasite Control

Turmeric is the
new favourite



Turmeric

Cinnamon previously looked very
promising but there's too much
brand variability.

Cinnamon



Caution!

- The spices that work need to be applied at the right amount not to harm the bees; it doesn't take much to do the job
- This doesn't kill the parasites like vaponal does, there will be far more parasite in the light traps
- Preliminary results will be published soon

Bee Prices \$\$

- 2018 Was >\$100/Gallon
- Alfalfa Seed Oversupplied
- Too Many Bees for Acres
- 2020 Projection - \$20/Gallon



This is the perfect time to try leafcutter bees on new crops

Acknowledgements



- Dr. Danica Baines - AAFC Lethbridge



- Dr. Theresa Pitts-Singer – USDA Logan UT



- Talon Gautier – PRFSA General Manager



- ASCA Board Members

Thank You

Questions?