

Best Before..... Yesterday

Presented in 2012

To Chill, or, not to Chill

- Most Beneficial Insects and Mites can be stored for anywhere from 3 weeks to 6 months without damage that would be detected by Industry Quality tests or visual inspection.
- “Quality” in *my* Industry is defined as “live mobiles” or “emergence”
- “Quality” in *your* Industry is defined as “performance” and “cost”
- Movement and Emergence are not indicative for *your* definition of “Quality”

Aphidoletes @ Rijnplant, DenHague

Anthurium 1995

Fresh Product

- 8 release points per hectare
- 3,000 midges per hectare weekly
- Effective prevention of Foxglove Aphid

Stored Product

- 16 release points per hectare
- 10,000 midges per hectare weekly
- Did not prevent damage due to Foxglove Aphid

Encarsia @ Canagro, Delta Tomato 1995 to 1998

“Non-stored” Product

- First year rate 0.5 to 2.0 wasps per square meter weekly
- Second and Third year rate 0.25 to 1.0 wasps per square meter weekly
- No other Whitefly control used
- Highest count (in first year) was 2 Whitefly per yellow card (once). Effectively, Complete Control

Competitive Product

- @ Pacific Lagoons (sister company, same Tomato)
- 1 to 8 *Encarsia* per square meter weekly
 - 2 to 4 *Eretmocerus* per square meter (summer) weekly
 - 1 *Dicyphus hesperus* per square meter total (annual)
 - Poor control requiring some chemical intervention

Encarsia @ Prism, Leamington Tomato 2009

“Max” in South 12 acres

- 0.5 to 2.0 wasps per square meter weekly
- No other Whitefly controls
- No detectable Whitefly

Competitor in North 12 acres

- 1 to 12 wasps per square meter *Encarsia* weekly
- 4 to 8 *Eretmocerus* per square meter weekly (late Spring to end)
- Competitor asked to leave in July. House given to us. Chemical correction in August.

Searching Ability = Prevention



- Based on the Rijnplant trials we expanded the preventative program to peppers the following year and then to all ornamentals the subsequent years.
- Terra Nova, Oregon
- Nature Fresh, Leamington
- Doef's, La Combe
- Sunselect, Delta

“Best Before”, or “Completely Useless After”

- Most Beneficials deteriorate on a straight line, over time
- Deterioration varies from Beneficial to Beneficial
- Mites see a sex ratio shift, male to female
- Midges absorb their eggs
- Wasps lose their searching behavior and eggs
- The Industry has decided that 18 days is OK for Mite storage

Predatory Mites

- Lay eggs based on successful mating
- Females eat males when food runs out
- Storage negatively affects long term control of affected spot, but, short term effects are not seen
- *Persimilis* and *swirskii* control by “over-populating” the site, due to shorter life cycle than prey



Parasitic Wasps

- Lose Searching ability if stored below critical temperature (somewhere between 8 and 6 Celsius) for even very short periods (6 to 8 hours)
- Lose egg laying capacity over time



How to Improve “Grower” Quality

- Sell them “fresh” products
- Limit the amount of ice used in shipping
- Help them assess “fitness” (Quick and Dirty Quality Assessment, on Web Site)
- Help them understand the biology of the beneficials and the pest (Technical Manual, on Web Site)
- Make strategies simple and effective (Recommendations on Web Site)
- www.appliedbio-nomics.com

Improving your Golf Score can have a Negative effect on your Biological Control

- Poinsettia at Meeslouwer in Stompwijk
- Years of excellent Whitefly control with Whitefly seldom seen
- Last year I visited in late November, and was surprised to see a couple of Whitefly
- Benfried, our distributor had not changed anything, so, what had changed to allow Whitefly to actually remain detectable in crop?
- Grower, over coffee, suddenly said; “Dad changed his tee off time”.
- The time was earlier, so, he put the *Encarsia* in the fridge so he could put them out a day later.

Conclusions

- The difference between “Fresh” product and “Stored” product is not subtle
- Significant reductions in successful application rates are common, some, up to 90%
- “Fresh” product actually allows us to use different strategies
- Everything you get, from anyone in the Industry, truly was “best before yesterday”