

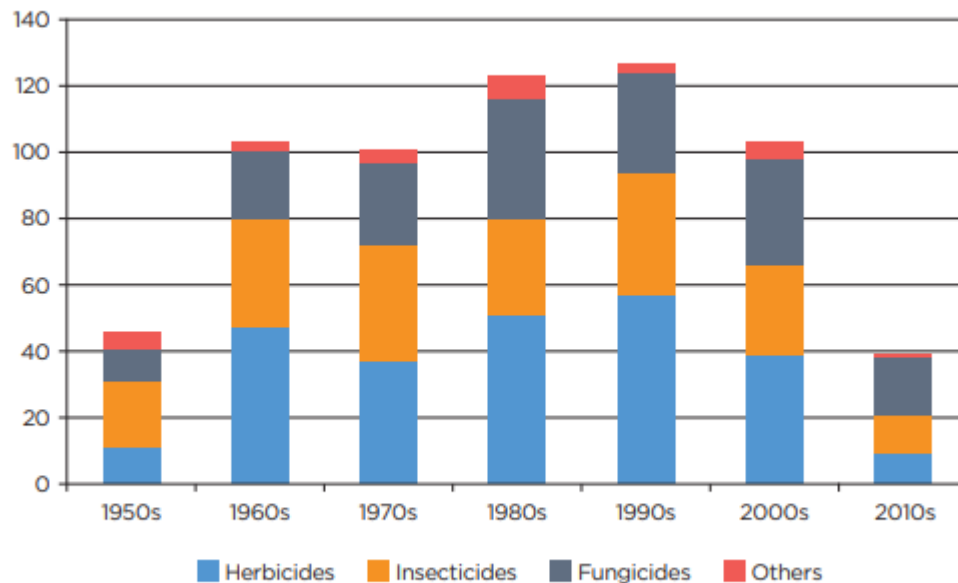
Research update on using Biological Pest Control's (BCA's) in Tomato Glasshouses

Presented by Lex Dillon

Introduction

- ▶ Growers around the world are finding that conventional chemical control is not as effective as it has been in the past
- ▶ Current chemicals are losing effectiveness and fewer new chemicals are coming on to the market
- ▶ A potential solution is to increase the use of the pests natural predators (BCA's) as the main method of pest control

Figure 2: Number of new active ingredients introduced per decade: 1950s to present day



But Isn't using Biologicals Too Hard?

- ▶ 99% of New Zealand's Tomato growers are already using Biologicals
- ▶ Bumble Bees are our primary pollination tool and few if any current growers would remember the laborious manual vibration of tomato plants to set fruit
- ▶ BCA's for pest control are just another step down the Bumble Bee road
- ▶ So where should we start on our BCA pest control journey?

Lessons from the Trials

-Lesson #1

- ▶ A good place to start is understanding the pests you are trying to control

Understanding the pests

- ▶ Understand the ways that the pest damages your crop
- ▶ Understanding the life cycle of the pests (eg eggs, nymph's, larvae or adults)
- ▶ Understand where the pest lives on the plant
- ▶ Understand what the pest and, signs of the pest look like

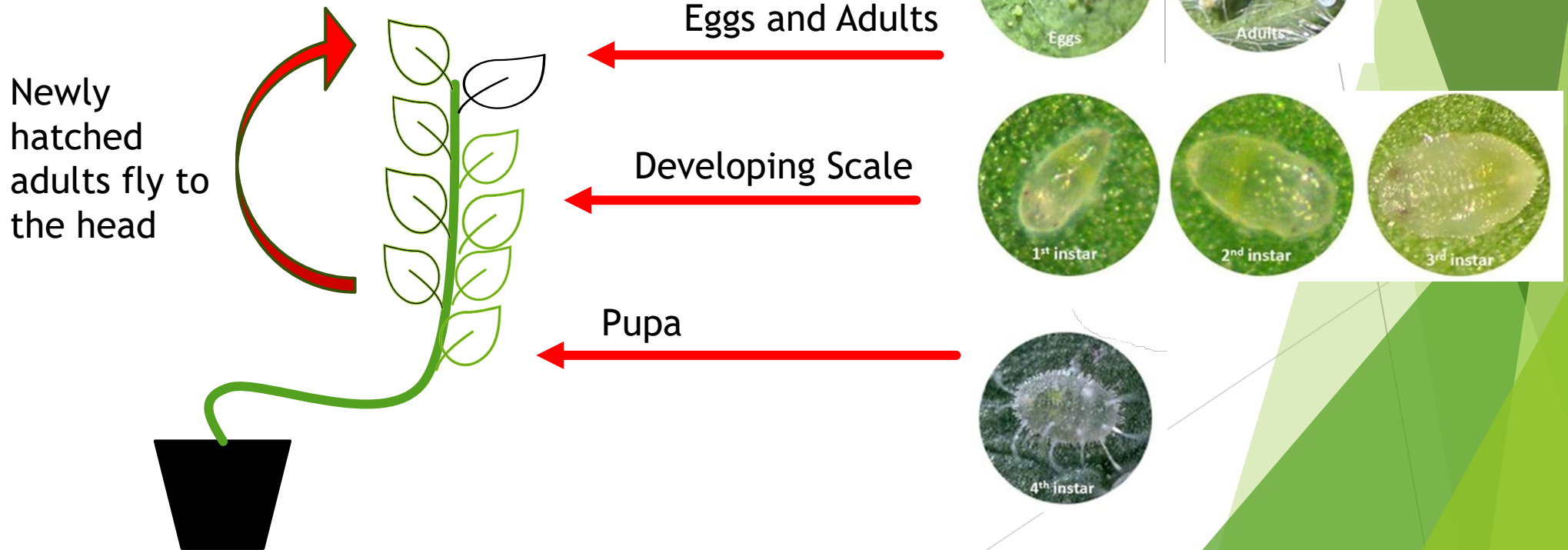
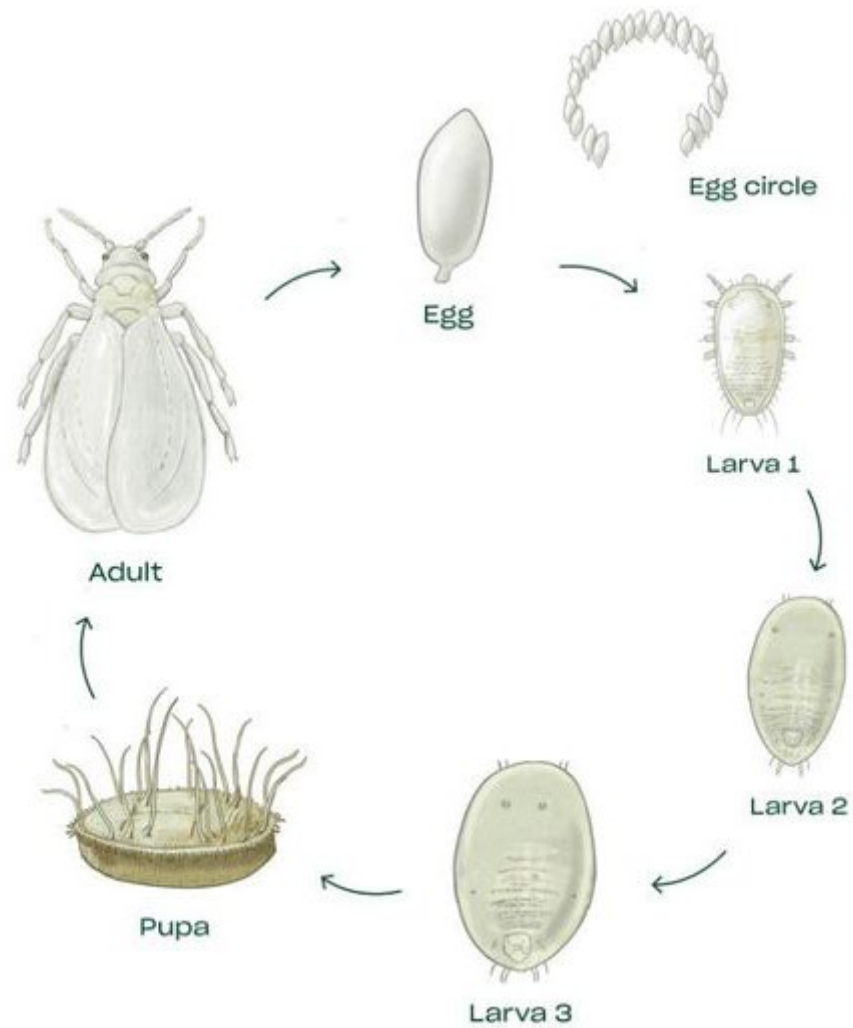


Illustration of Whitefly Life cycle

Approximately
20 days to
complete



Lessons from the Trials

-Lesson #2

- ▶ Make sure you advise your nursery that you plan to use BCA's
- ▶ Advise your nursery that they should discuss the use of any chemical treatments upon your plants prior to using them.
- ▶ Note-1- Its not that they can't use chemicals , its that you need to understand the implications that use will have on your BCA programme
- ▶ Note-2- Care needs to be taken to ensure chemical treatments don't impact on your Bumble Bees

Discussions you need to have with your plant suppliers

- ▶ You should advise your plant supplier (Nursery) that you plan to use BCA's in your crop and that they should not use sprays without consulting with you
- ▶ Some chemicals used at the nursery may continue to be active after the new plants have been planted in your greenhouse.
- ▶ This may harm your beneficial insects

Side effects		abamectin [×]	acrinathrin [×]	MAINMAN [×] flonicamid	LANNATE [×] methomyl		TRANSFORM WG [×] sulfoxaflor (=isoclast)
		SP	SP	SP	SP	DR	SP
<div style="background-color: #4CAF50; color: white; padding: 5px; display: inline-block;"> [×] Encarsia formosa </div>	larva		4	1		4	1
	adult	4	4	1	4	3	4
	pupa	1			4		
	persistence	3 w		0 w	6 - 10 w	1 w	2 w

Natural enemies	
1	= harmless or only slightly harmful < 25% reduction
2	= moderately harmful 25 - 50% reduction
3	= harmful 50 - 75% reduction
4	= very harmful > 75% reduction
ST	= ST – compatible
ST	= ST – incompatible
	= effect/persistence unknown
Persistence	
d = days, w = weeks	

Learnings from the Trials

-Lessons #3,#4,#5

- ▶ The earlier you introduce BCA's into your crop the better they will be at reducing the impact of pest incursions
- ▶ Supplementary feeding will help maintain the BCA population before pests arrive
- ▶ Some growers have questioned whether spending money on BCA's when you don't have pests, seems like a waste. Consider this cost as an "insurance policy" in crop protection

How and When to Introduce Beneficial Insects

- ▶ It is best to build a population of BCA's from the time that you plant your crops.
- ▶ This will act as an immediate defense when pests arrive
- ▶ Your BCA supplier will help advise with the quantities, location and timing of applications
- ▶ The quantity and frequency of additional BCA introductions will be determined by both beneficial and pest insect populations.
- ▶ How to use Engytatus <https://youtu.be/K3FMGFJm-zo>



A LIGHTER
TOUCH



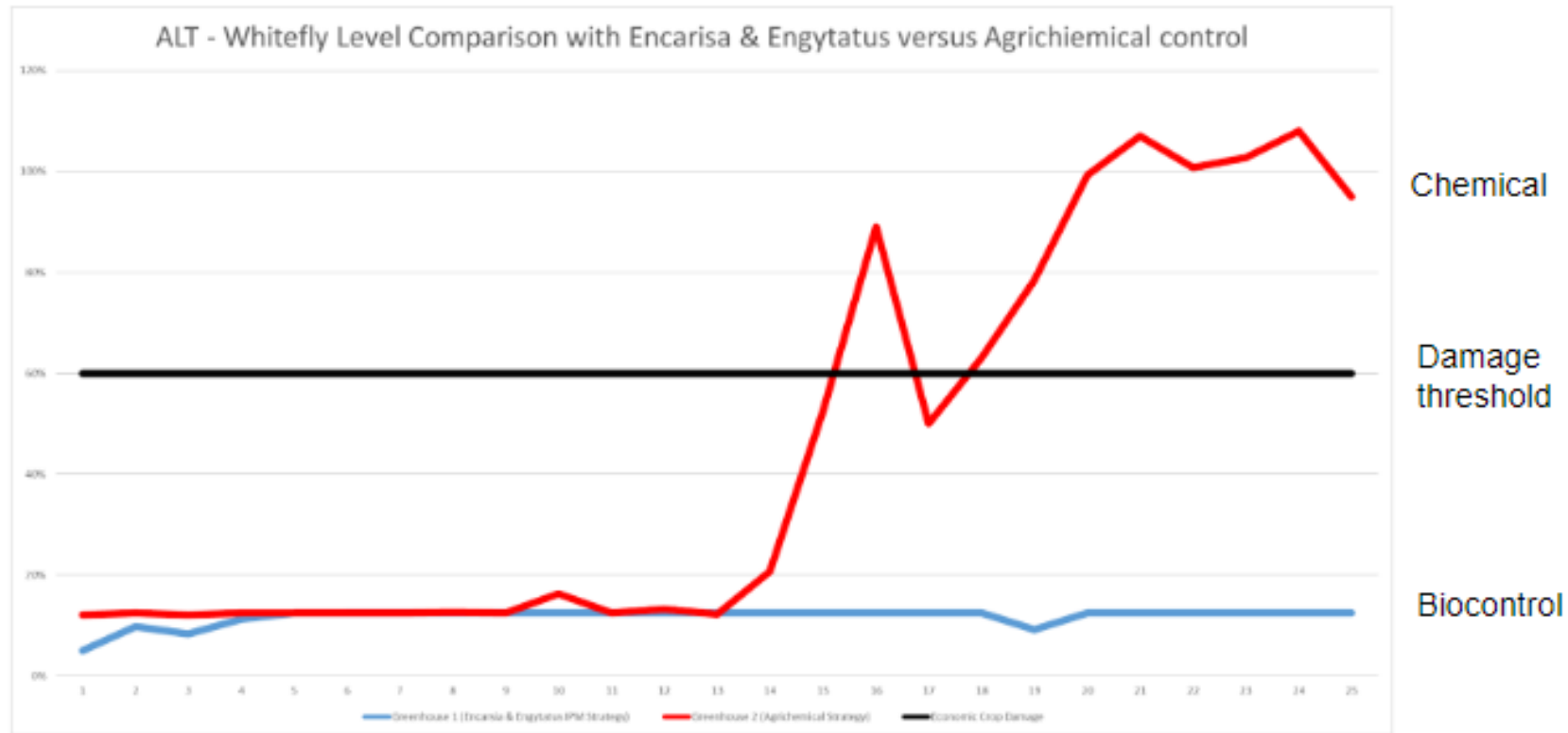
Learnings from the Trials

-Lesson # 6

- ▶ Regular and accurate scouting is needed to understand the population and distribution of both pests and BCA's on your crops
- ▶ Train staff to be extra sets of eyes

BCA's Are Not “Knockdown” Pest Controls- Lesson #7

- ▶ BCA's will not 100% eliminate pests
- ▶ You need some pests to allow the BCA's to survive
- ▶ BCA's suppress the pest population so as to minimize the economic impact of the crop damage



Beneficial Insects May Require some help- Lesson #8

- ▶ Surfactants such as soaps and oils will help act as barriers with pest incursions
- ▶ Mechanical interventions such as sticky traps and vacuum systems will also reduce pest numbers
- ▶ From time to time you may also need some chemical interventions.
- ▶ “Soft” sprays can target specific pests and cause little or no harm to your BCA’s
- ▶ Before using any sprays discuss this with your crop advisors or BCA supplier to check to see whether they may cause harm.
- ▶ Be very careful when using “hard” or non selective sprays. This may result in not being able to use BCA’s for some time.
- ▶ How to deal with spot pests: <https://youtu.be/LGHbVJ7vW78>



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Not everything may go as planned

Lesson # 9 Patience

- ▶ Remember that you are dealing with a natural process and that not everything may go as planned
- ▶ Glasshouses that have high levels of technology have more tools to help manage the environment, but this has not stopped some low tech growers having BCA success.
- ▶ Every grower has a different environment, different outside influences and different tolerance levels . There will be some situations where conventional pest control, may be the most effective option
- ▶ Sometimes it takes weeks or even months for the BCA's to gain control. You need to be patient and if you have concerns discuss this with your crop and BCA advisors to come up with the best solution for you

A Lighter Touch (ALT) and Tomatoes NZ Research Project

- ▶ A multi year research project is currently being undertaken to determine which BCA's are most effective and how to best use them
- ▶ Both large high tech and small family owned grower businesses are participating in the project.
- ▶ Not every trial has been 100% effective on all pests but, all are showing positive results
- ▶ In the last 3 years there has been a significant increase in growers using BCA's
- ▶ A number of resources are being developed that will help you on your BCA and IPM Journey and will be available through Tomatoes NZ and A Lighter Touch