

Natural Pollinators in Ontario Greenhouses

Amanda Tracey

(A) Greenhouse Vegetable IPM Specialist

OMAFRA

amanda.tracey@ontario.ca

Outline

Introduction

Materials & Methods

Results & Discussion

Conclusions

Acknowledgments

Introduction

- Pollination is required for many crops
 - Normal fruit set
 - Pollination is fertilization of flower
 - resulting in fruit formation
 - Even pollination = Even fruit quality
- Commercial sector dominated by one species
 - *Bombus impatiens*
 - Native bumblebee



Photo Credit: Les Shipp

Introduction

- Other pollinator species are often found in greenhouses
 - Naturally occurring
 - Come in through vents
- Examples:
 - Syrphid flies
 - Butterflies and moths
 - Ladybird beetles
 - Other bees
 - Other flies



Adult Syrphid
Photo Credit: Eli Bennett

Materials & Methods

Weekly observation were conducted

Vegetable greenhouse

- 13 weeks (May-Aug. 2016)
- 4 Leamington operations
- 16 separate structures
- 3 crops (tomato, pepper and cucumber)

Flower greenhouse

- 6 weeks (July-Aug. 2016)
- 1 Simcoe area operation
- open walled structure
- 1 crop (chrysanthemums)



Photo Credit: Gillian Ferguson

Materials & Methods

- Pollinator and pest abundance was estimated
 - Average: # of observations/row sampled/crop
- All bumblebees were excluded
- Looper damage was included as an observation
 - Not included with other lepidopterans as pollinator
- Flower stats not included in graphs
 - Small sample size, short time period
 - May not be good representation



Photo Credit: Gillian Ferguson

Results & Discussion

	Bees	Lepidoptera	Soldier Beetles	Syrphids	Other Flies	Other
Cucumbers	0.18	0.00	0.00	0.00	0.06	0.01
Peppers	0.42	0.01	0.11	0.11	0.12	0.00
Tomatoes	0.01	0.05	0.00	0.01	0.07	0.00
Mums	0.00	0.60	0.00	1.10	0.00	0.10

Table 1: Pollinator observations per row

Results & Discussion



Figure 2. Pepper flower with Amblyseius degenerans, note the abundant and accessible pollen and nectar (E. Bennett)

Results & Discussion

	Bees	Lepidoptera	Soldier Beetles	Syrphids	Other Flies	Other
Cucumbers	0.18	0.00	0.00	0.00	0.06	0.01
Peppers	0.42	0.01	0.11	0.11	0.12	0.00
Tomatoes	0.01	0.05	0.00	0.01	0.07	0.00
Mums	0.00	0.60	0.00	1.10	0.00	0.10

Table 1: Pollinator observations per row

Results & Discussion

	Aphids	Loopers	Mites	Thrips	Whitefly	Other
Cucumbers	0.45	0.04	1.57	1.07	0.02	0.01
Peppers	2.16	0.18	0.23	0.48	0.13	0.54
Tomatoes	0.00	1.64	0.20	0.05	0.57	0.01
Mums	0.20	0.10	0.00	0.00	0.00	0.30

Table 2: Pest observations per row

Results & Discussion

Difference	Location A	Location B
Surroundings	Paved and unpaved road	Wheat fields
Banker plants	Aphids hosting <i>Aphidius colemani</i>	None
Ladybirds	3 adults	36 adults, 4 larvae

Table 3: Differences between pepper locations that may have affected syrphid populations

Results & Discussion

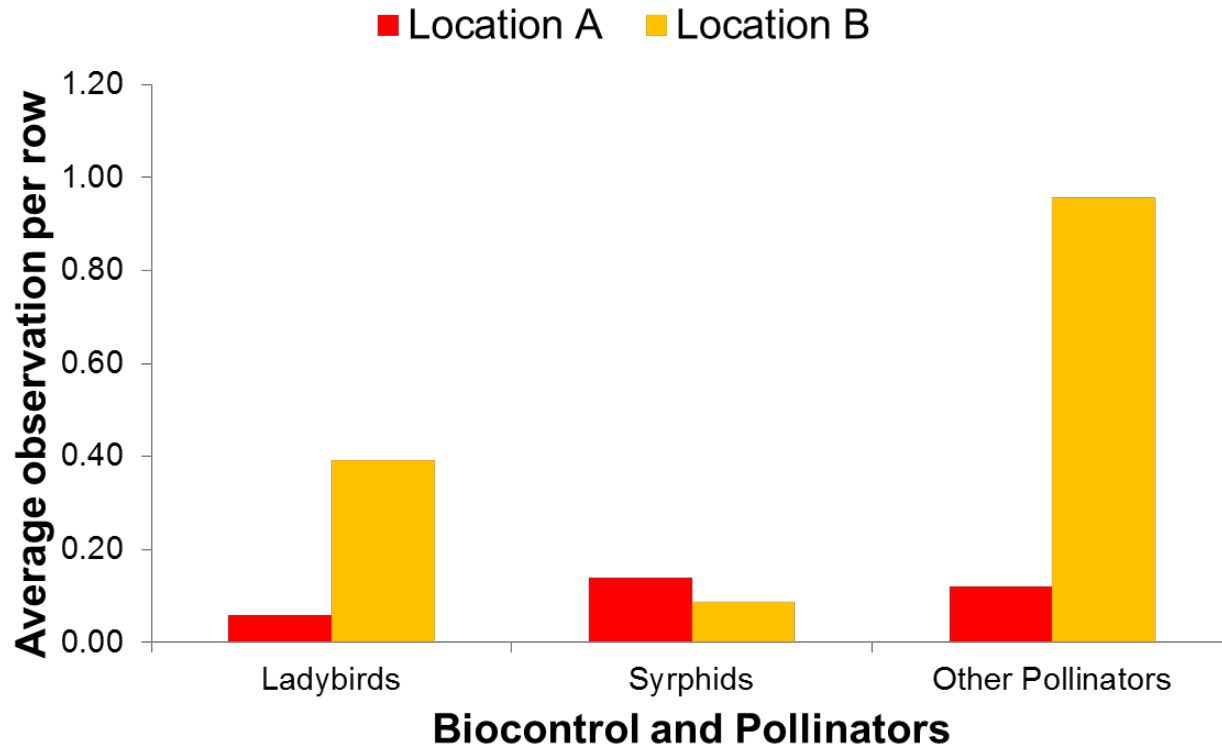


Figure 3. Average number of ladybird beetles and syrphids in greenhouse peppers

Results & Discussion

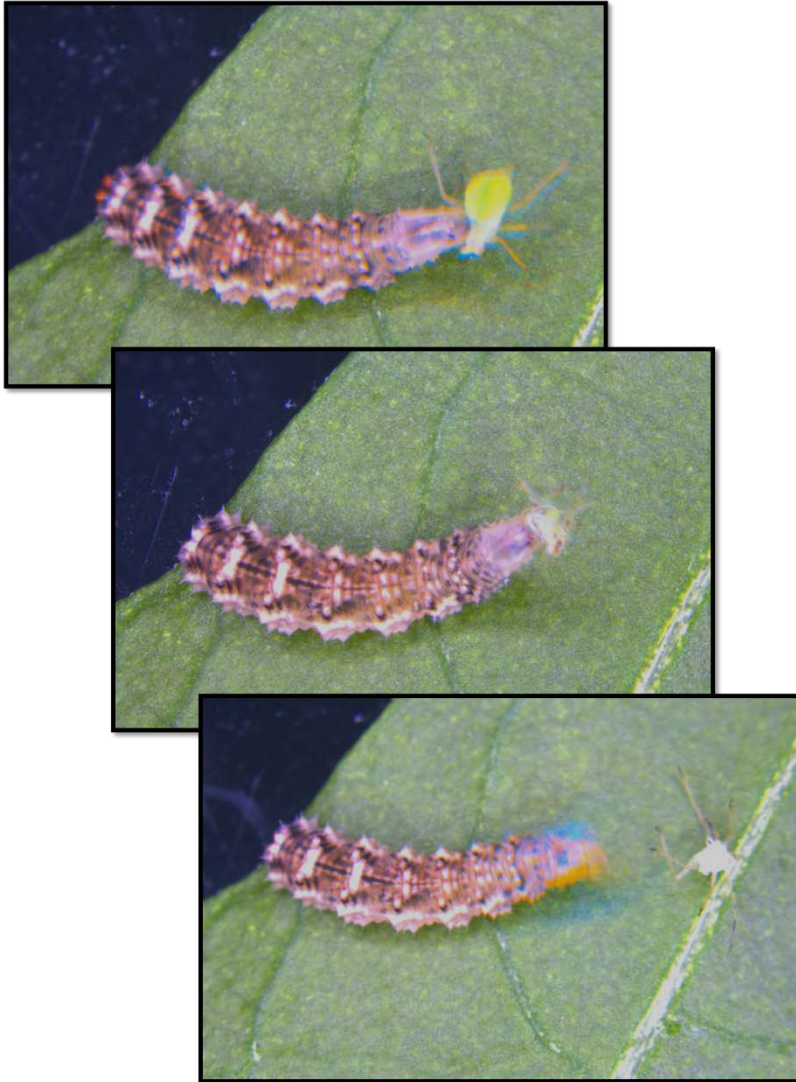


Fig. 4. Syrphid larva from Location B eating an aphid and discarding the remains. (R. Labbé)

Conclusions

- First Canadian study to examine the ingress of syrphids into greenhouses
 - to our knowledge.
- Aphidophagous syrphids are entering greenhouses
 - preferring peppers and open-walled structures.
- Further research is required to determine best species for IPM in southern Ontario.
- Intraguild predation must be evaluated
- Delivery strategies need to be developed

Conclusions

- Conservation of populations is challenging
 - adults are highly mobile
- Possible solutions:
 - banker plantings for food sources like aphids and pollen
 - augmentative release using eggs
- Pollen is required by syrphids for reproduction
 - pepper pollen should be evaluated

Conclusions

- Aided pepper pollination increases the size and quality of fruit.
- Syrphids as biocontrol may provide pollination as an added value
 - another area of investigation.
- Start looking for alternate pollinators in your crop
 - Could be beneficial in more ways than one

Acknowledgments

Primary Researchers

Eli Bennett
Roselynn Labbe
Cara McCreary



FLOWERS CANADA
GROWERS

Lab and Field Assistance

Jessica Wright
Dana Gagnier
Shalin Khosla
Melanie Filotas
Rebecca McKague



Ontario



Agriculture and
Agri-Food Canada

Agriculture et
Agroalimentaire Canada