



Fly Management Best Practices

Do not duplicate without written permission.

Cassie Krejci, Ph.D.

Cassie.Krejci@mgk.com



TODAY'S GOALS



Fly Biology



The Importance of Fly Control



Best Practices



Insecticides

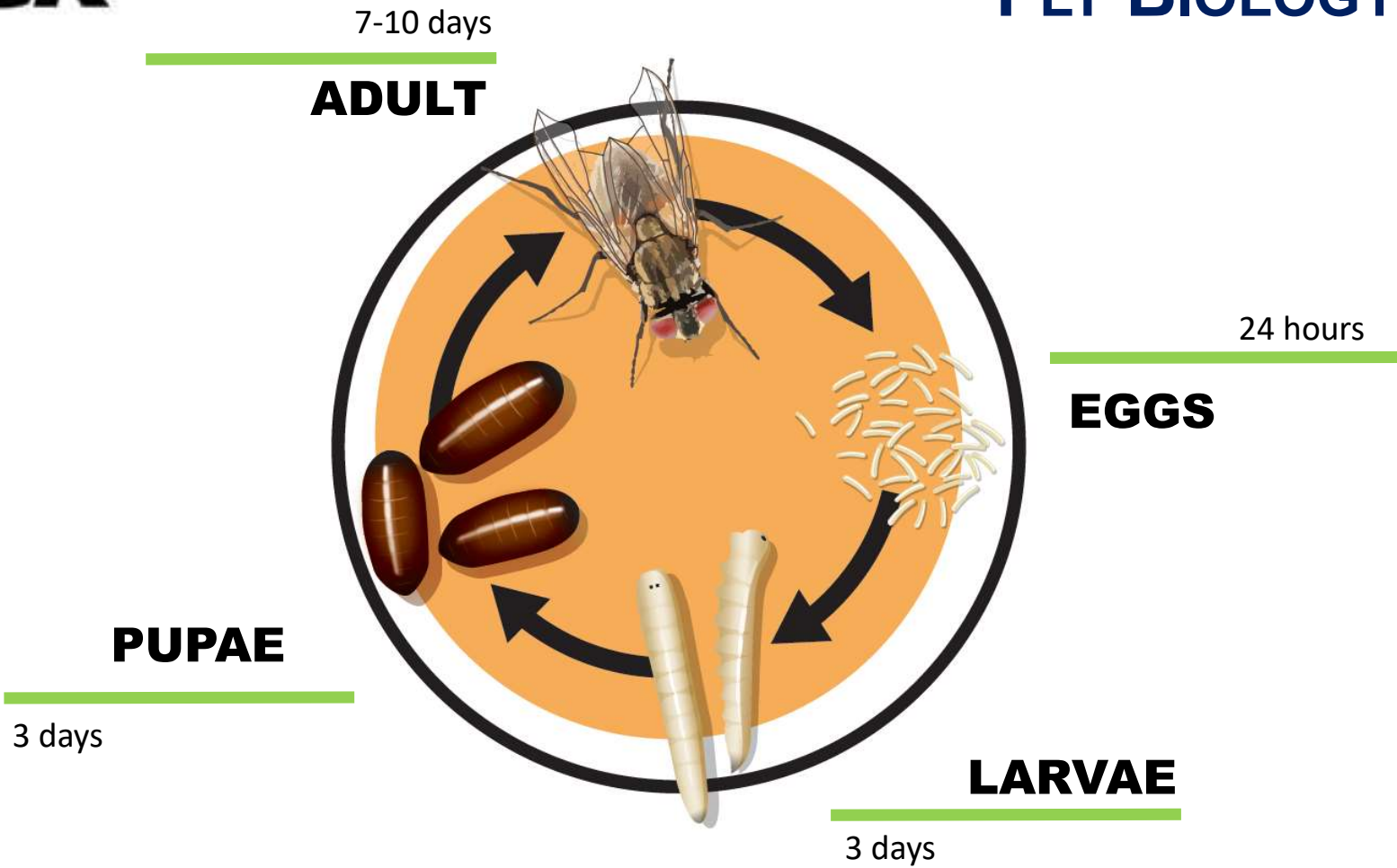


Fly Management Program: An Example

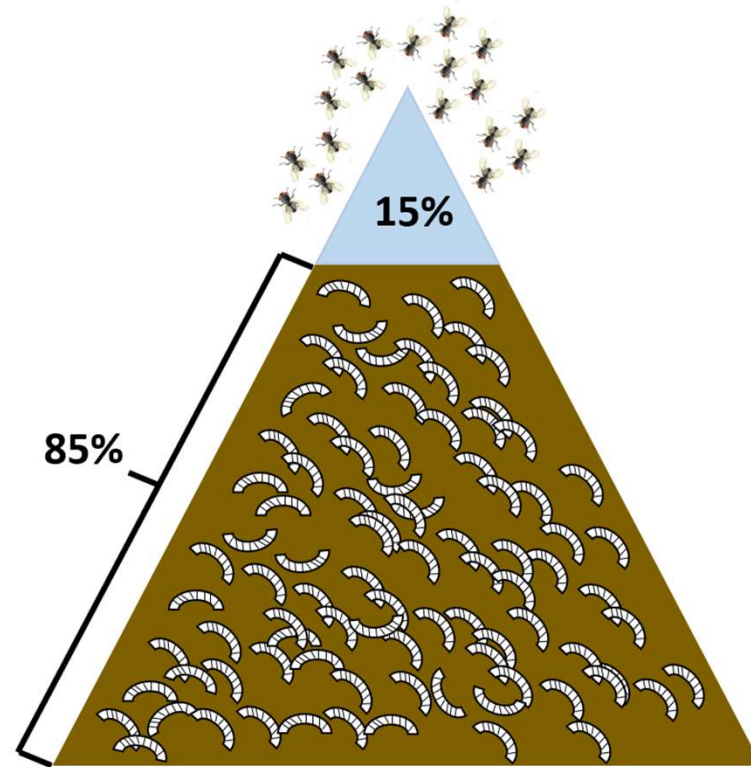
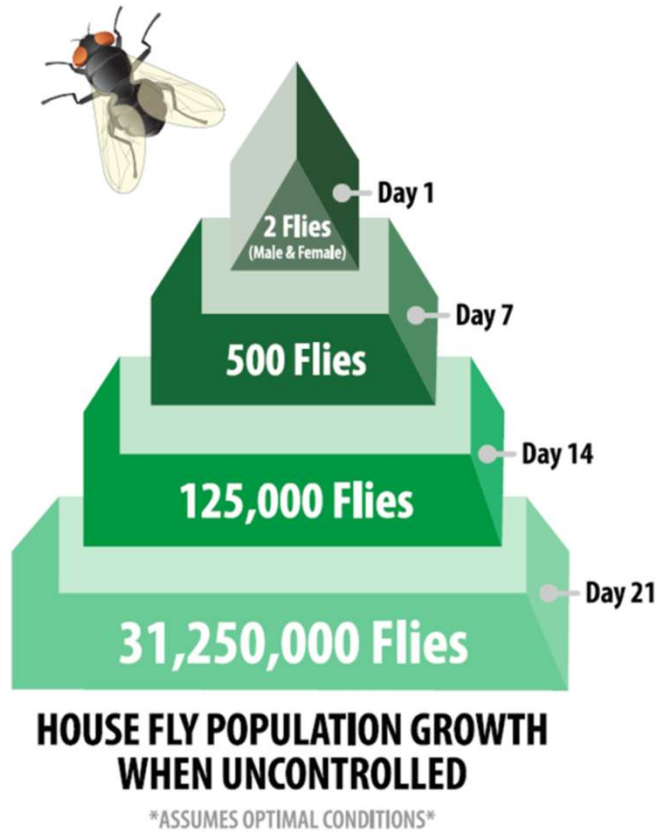





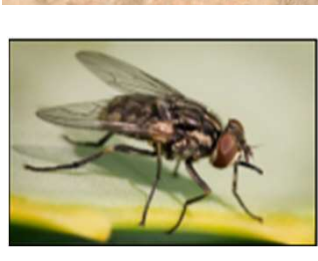
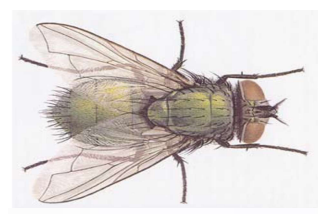

FLY BIOLOGY



Do not duplicate without written permission.



Filth Fly Identification

HOUSE FLY		<p>6-9 mm LONG</p>	<p>Color: grey and black, 4 black stripes on thorax. Non-biting, sponging mouthparts.</p>	<ul style="list-style-type: none"> • Animal waste • Animal areas • High moisture
STABLE FLY		<p>5-7 mm LONG</p>	<p>Color: brownish-grey, green-yellow sheen, 7 black spots on abdomen. Biting (piercing-sucking) mouthparts.</p>	<ul style="list-style-type: none"> • Moist litter piles & row crops
BLOW FLY		<p>8-10 mm LONG</p>	<p>Color: metallic blue or green, sponging mouthparts</p>	<ul style="list-style-type: none"> • Maggots live in decaying tissue. • Near animal refuge
FRUIT FLY		<p>2-3 mm LONG</p>	<p>Color: yellow-brown with brick-red eyes, rings across abdomen.</p>	<ul style="list-style-type: none"> • Moisture • Fermentation, ripe / rotting / decaying fruit / organic matter



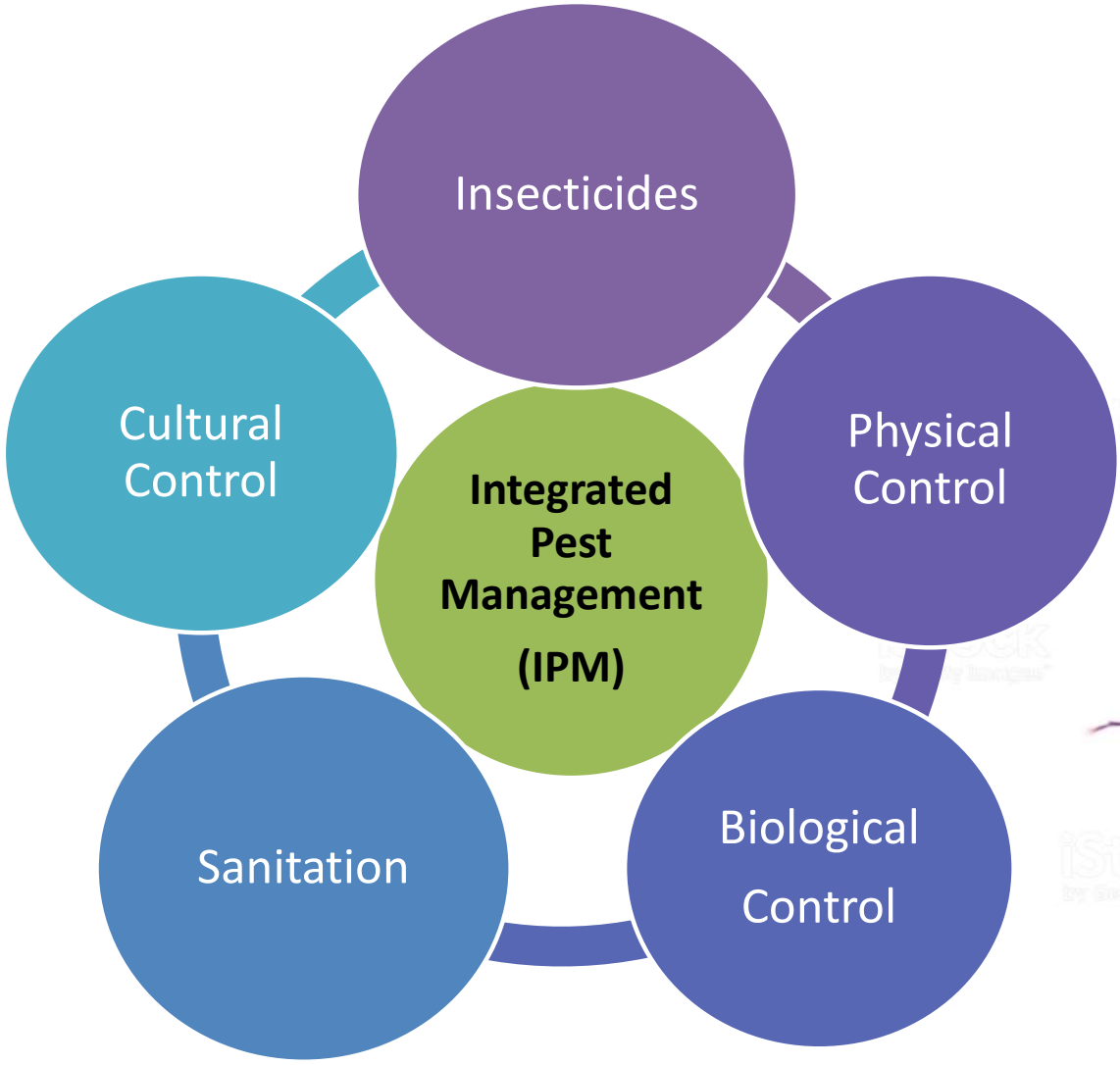
THE IMPORTANCE OF FLY CONTROL



- Flies are a health risk & are mechanical vectors of disease-causing pathogens.
- In U.S. livestock & poultry production, flies are responsible for damage in excess of a billion dollars per year.
- The economic damage level has never been set.
- Flies are an overall nuisance, reducing bird and worker efficiency.

Do not duplicate without written permission.

FLY MANAGEMENT BEST PRACTICES



Do not duplicate without written permission.

Cultural
Control



FLY MANAGEMENT BEST PRACTICES

Inspection & Monitoring

- Remove conducive conditions
- Look for moisture issues
- Fans
- Mowing

Do not duplicate without written permission.

Physical
Control



FLY MANAGEMENT BEST PRACTICES

More difficult for outdoor areas

- Fans
- Screens (0.88mm – 1.22 mm)
- Traps



Do not duplicate without written permission.

Sanitation



FLY MANAGEMENT BEST PRACTICES

The most important part!

- Reduce feed & water sources
- Reduce breeding sites
- Bury mortality

Do not duplicate without written permission.

Biological
Control

FLY MANAGEMENT BEST PRACTICES



Do not duplicate without written permission.



Insecticides

A SHORT COURSE

Do not duplicate without written permission.



What is an insecticide class?

- Based on Mode of Action
 - Mechanism or response to a pesticide that results in a toxic action in an organism
 - Act on the Nervous System
- Adulticides v. Insect Growth Regulators (IGRs)
- 29 classes
 - 4 adulticides
 - 3 (IGRs)

Insecticides

What is an insecticide class?

EVERGREEN[®]
Pro 60-6

GROUP 3A INSECTICIDE

• Multi-Purpose Insecticide

ACTIVE INGREDIENTS:	
Pyrethrins	6.00%
*Piperonyl butoxide	60.00%
OTHER INGREDIENTS	
	34.00%
	100.00%

* (butylcarbyl) (6-propylpiperonyl) ether and related compounds.

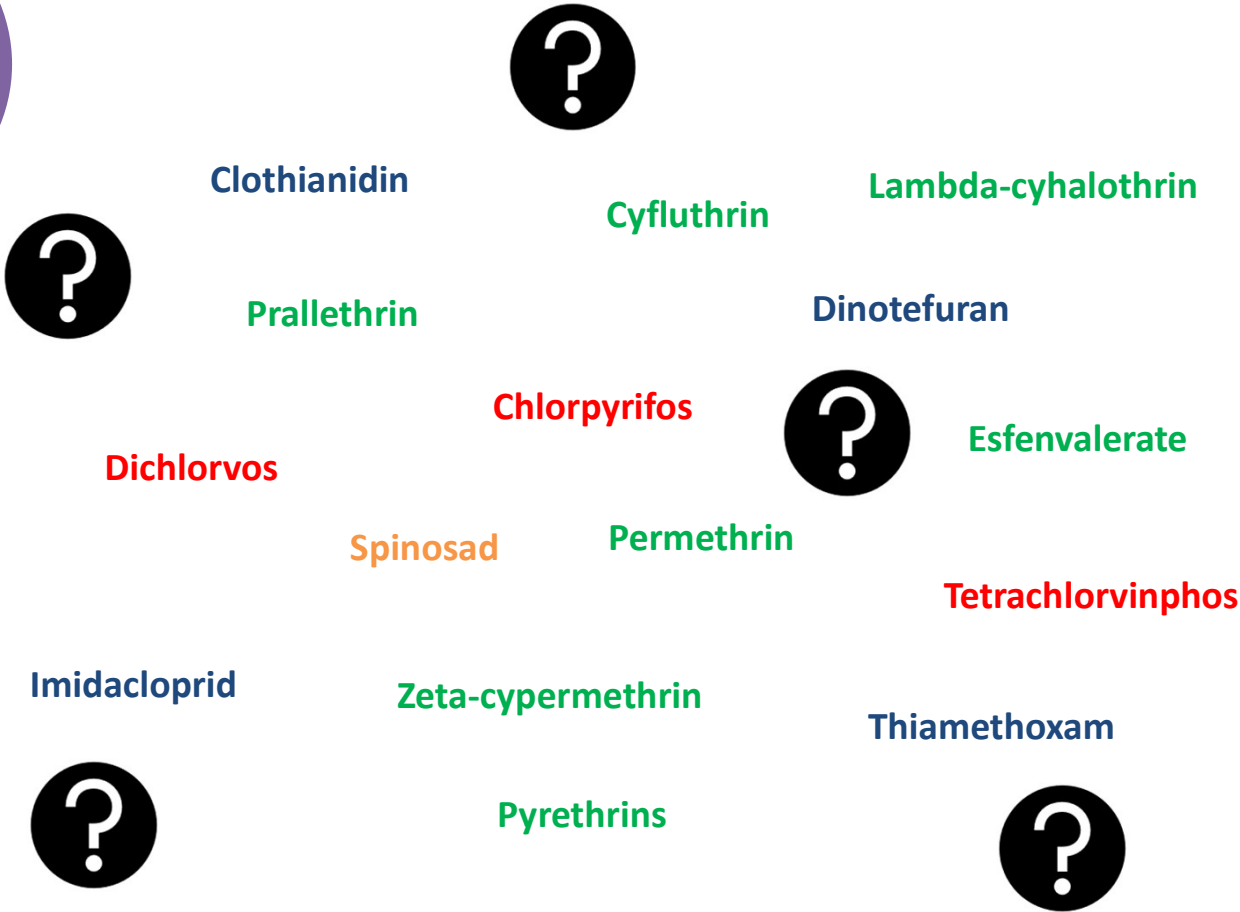
EVERGREEN[®]
Pro 60-6

GROUP 3A INSECTICIDE

PHYSICAL OR CHEMICAL HAZARDS
Do not use for domestic heat or open flame.

Do not duplicate without written permission.

Chemical Classes





Insecticides

Chemical Classes

Pyrethroids and Pyrethrins (3A)

Prallethrin Permethrin
Cyfluthrin Lambda-cyhalothrin
Zeta-cypermethrin Pyrethrins
Esfenvalerate

Neonicotinoids (4A)

Clothianidin
Dinotefuran
Imidacloprid
Thiamethoxam

Organophosphates (1B)

Dichlorvos
Chlorpyrifos
Tetrachlorvinphos

Spinosyns (5)

Spinosad



Pyrethrins vs. Pyrethroids: What's the difference?

Natural py

Pyrethrum

Pyrethrins

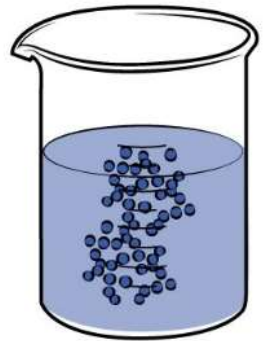
Permethrin

Pyrethroids



Pyrethrins vs. Pyrethroids

- **Pyrethrum** – total extract from chrysanthemum flowers
- **Pyrethrins** – the 6 esters (molecules) that act as the killing agent in the extract
- **Pyrethroids** – synthetic compounds composed to mimic effects of pyrethrins





Pyrethrins vs. Pyrethroids: What's the difference?

Pyrethrum



Pyrethroids



Insecticides

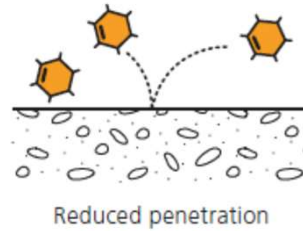
- Dipteran Molting Disruptors
 - Cyromazine
- Juvenile Hormone Analogs
 - Methoprene (7A)
 - Pyriproxyfen (7C)
- Chitin Synthesis Inhibitors
 - Novaluron

Insect Growth Regulators



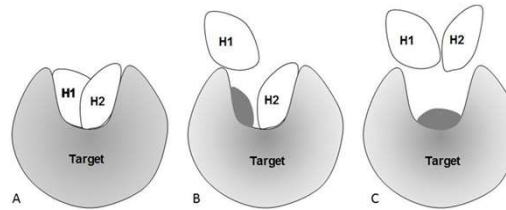
Insecticides

Product Rotation & Combating Resistance

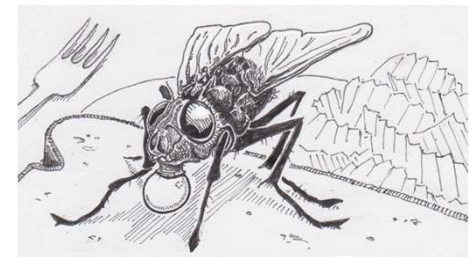
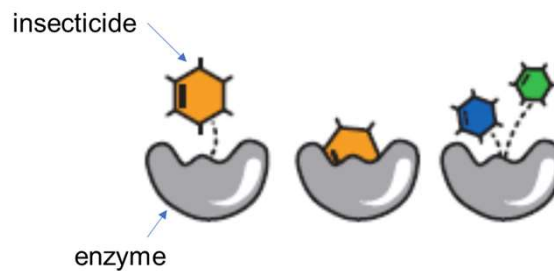


What is Resistance?

- Genetic ability of an organism to tolerate the poisonous effects of a toxicant
 - Inheritable



- Types:
 - Cuticular
 - Target-site
 - Metabolic
 - Behavioral



Insecticides

What is Resistance?

- Genetic ability of an organism to tolerate the poisonous effects of a toxicant
 - Inheritable
- Types:
 - Cuticular
 - Target-site
 - Metabolic
 - Behavioral



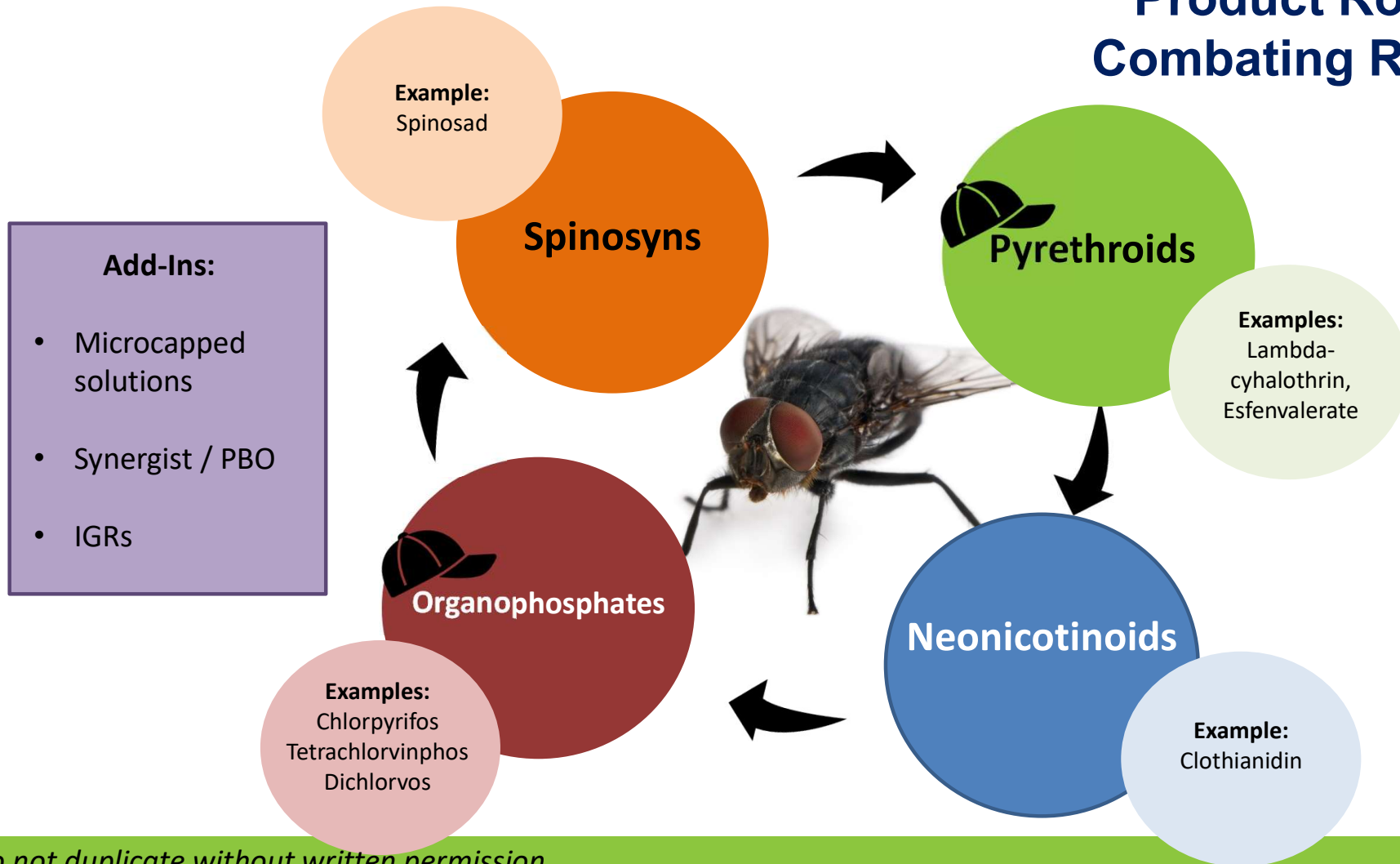
Product Rotation & Combating Resistance

How to avoid resistance?

- **Switch** between products with different chemical classes in order to prevent resistance
 - At least once a year
- Whole-facility treatments
- Utilizing PBO



Product Rotation & Combating Resistance



Do not duplicate without written permission.

FLY MANAGEMENT PROGRAM EXAMPLE

1. Cultural Control & Sanitation

Tips for Success

2. Premise Applications

- Keep Rotating Insecticides
- Add an IGR & Synergize
- Water Quality
- Keep litter & compost dry, remove as much litter as possible

3. Over-animal applications

4. IGRs

5. Baits

6. RTUs

PREMISE APPLICATIONS



Do not duplicate without written permission.



PREMISE APPLICATIONS



Do not duplicate without written permission.



OVER-ANIMAL APPLICATIONS



Oil-based
Vs.
Water-based

Do not duplicate without written permission.



IGRs

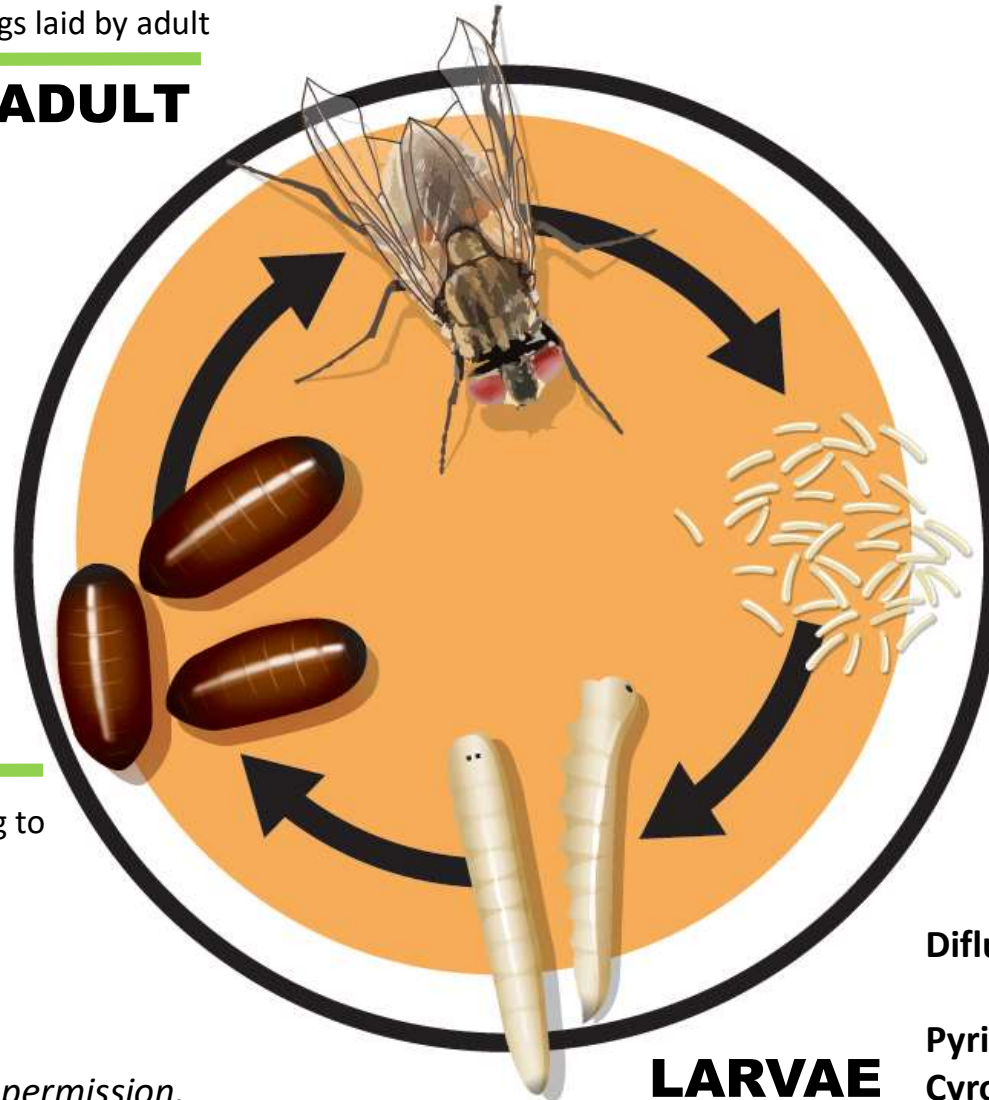


Do not duplicate without written permission.



Pyriproxyfen: Reduces # of eggs laid by adult

ADULT



Pyriproxyfen: Reduced egg viability

EGGS

PUPAE

Pyriproxyfen: Flies die while trying to pupate.

Diflubenzuron & Methoprene:

keeps larvae in this stage

Pyriproxyfen: results in large, fat larvae

Cyromazine: keeps larvae from molting

LARVAE

Do not duplicate without written permission.



FLY BAITS

Class	Bait	Actives	Mft.	Attractant	Benefits
Diamides	Cyanarox®	Cyantraniliprole 0.5%	Central	Sucrose (sugar, % trade secret)	Uncommon MOA
Carbamates	Golden Malrin®	Methomyl 1%	Central	(z) - 9-tricosene (sex, 0.05%) + Sucrose (sugar 98.9%)	Encourages both M & F flies to feed
Neonicotinoids	Maxforce®	Imidacloprid, 0.5%	Bayer	Muscalure (sex, 0.1%)	Effective against OP/Carbamate resistant flies
	QuickBayt®	Imidacloprid, 0.5%	Bayer	Proprietary	
	QuickStrike®	Dinotefuran 0.5%	Central	(z) - 9-tricosene (sex, 0.04%) + Sucrose (sugar 99%)	
Neonicotinoid	Decimari®	Clothianidin 0.5% Pyrproxyfen 0.05%	MGK	Proprietary	Dual MOAs: Adulticide + IGR

Do not duplicate without written permission.

RTUs



Do not duplicate without written permission.

FLY MANAGEMENT PROGRAM EXAMPLE

1. Cultural Control & Sanitation

Tips for Success

2. Premise Applications

- Keep Rotating Insecticides
- Add an IGR & Synergize
- Water Quality
- Keep litter & compost dry, remove as much litter as possible

3. Over-animal applications

4. IGRs

5. Baits

6. RTUs



THE IMPORTANCE OF FLY CONTROL



- Flies are a health risk & are mechanical vectors of disease-causing pathogens.
- In U.S. livestock & poultry production, flies are responsible for damage in excess of a billion dollars per year.
- The economic damage level has never been set.
- Flies are an overall nuisance, reducing bird and worker efficiency.

Do not duplicate without written permission.

THANK YOU!

Cassie Krejci, PhD

Technical Specialist

(612)505-9551

cassie.krejci@mgk.com

Braxton Whitaker

Account Representative

(612)503-6319

Braxton.whitaker@mgk.com

John Whetzel

MWI Animal Health

(540)335-7962

jwhetzel@mwianimalhealth.com



Do not duplicate without written permission.