Introduction to Organic Pest Control and IPM

Brandon Merchant

Our Agenda

1. Introduction
2. What is IPM?
3. The Components of an IPM program
4. Tactics for Sustainable Success
5. Conclusions

Who am I?

Brandon Merchant

- Owner of Southwest Victory Gardens
- Former President of Tucson Organic Gardeners
- Master Gardener

SOUTHWEST VICTORY★ GARDENS LOCAL STARTS AT HOME

Organic Garden Design, Installation, and Maintenance

southwestvictorygardens.com

Did you know. . .

78 million households in the U.S. use home and garden pesticides.

Herbicides account for the highest usage of pesticides in the home and garden sector with over **90 million pounds** applied on lawns and gardens per year.

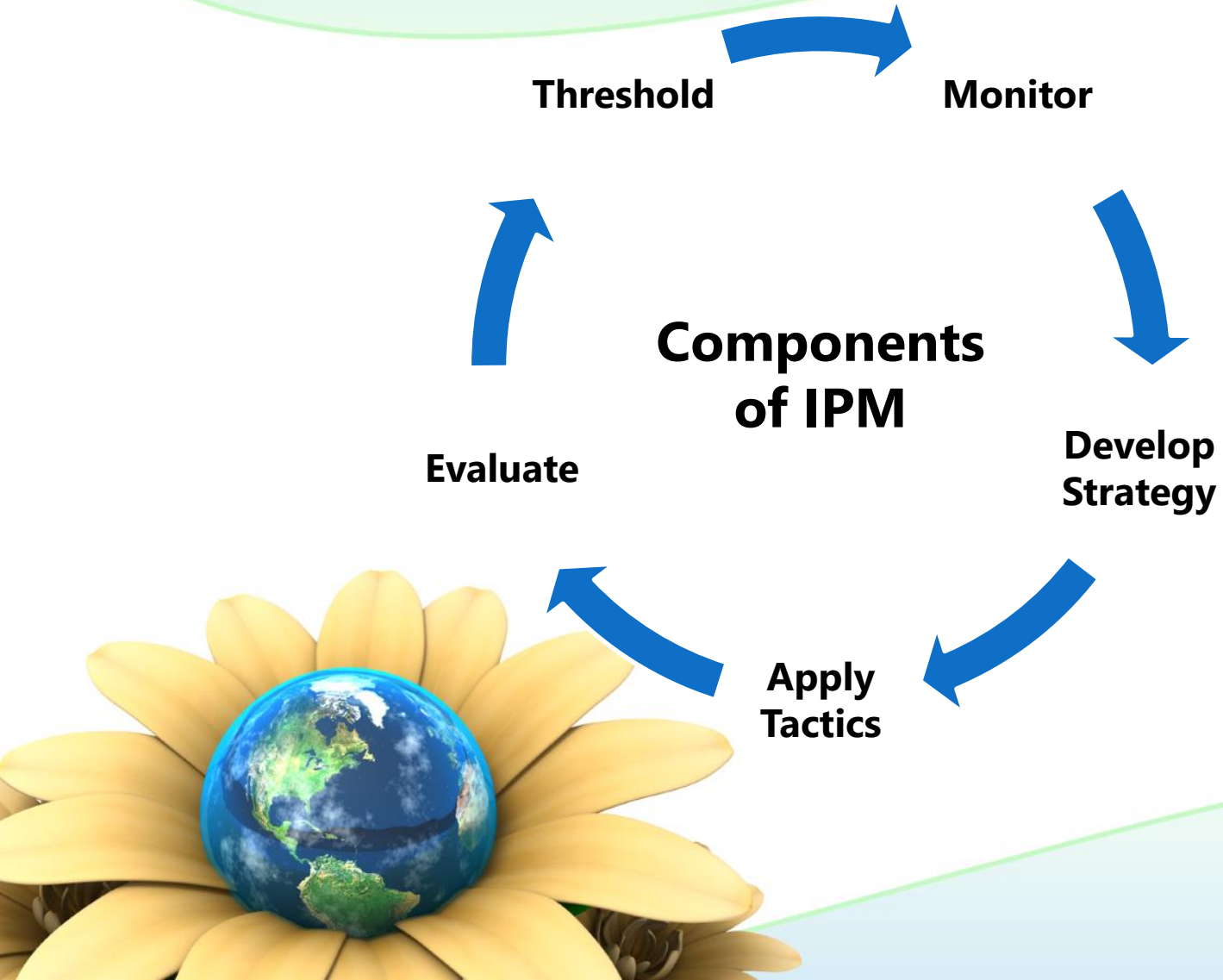
Scary but true. . .

On average, suburban lawns and gardens receive **more** pesticide applications per acre (3.2-9.8 lbs) than agriculture per acre (2.7 lbs).

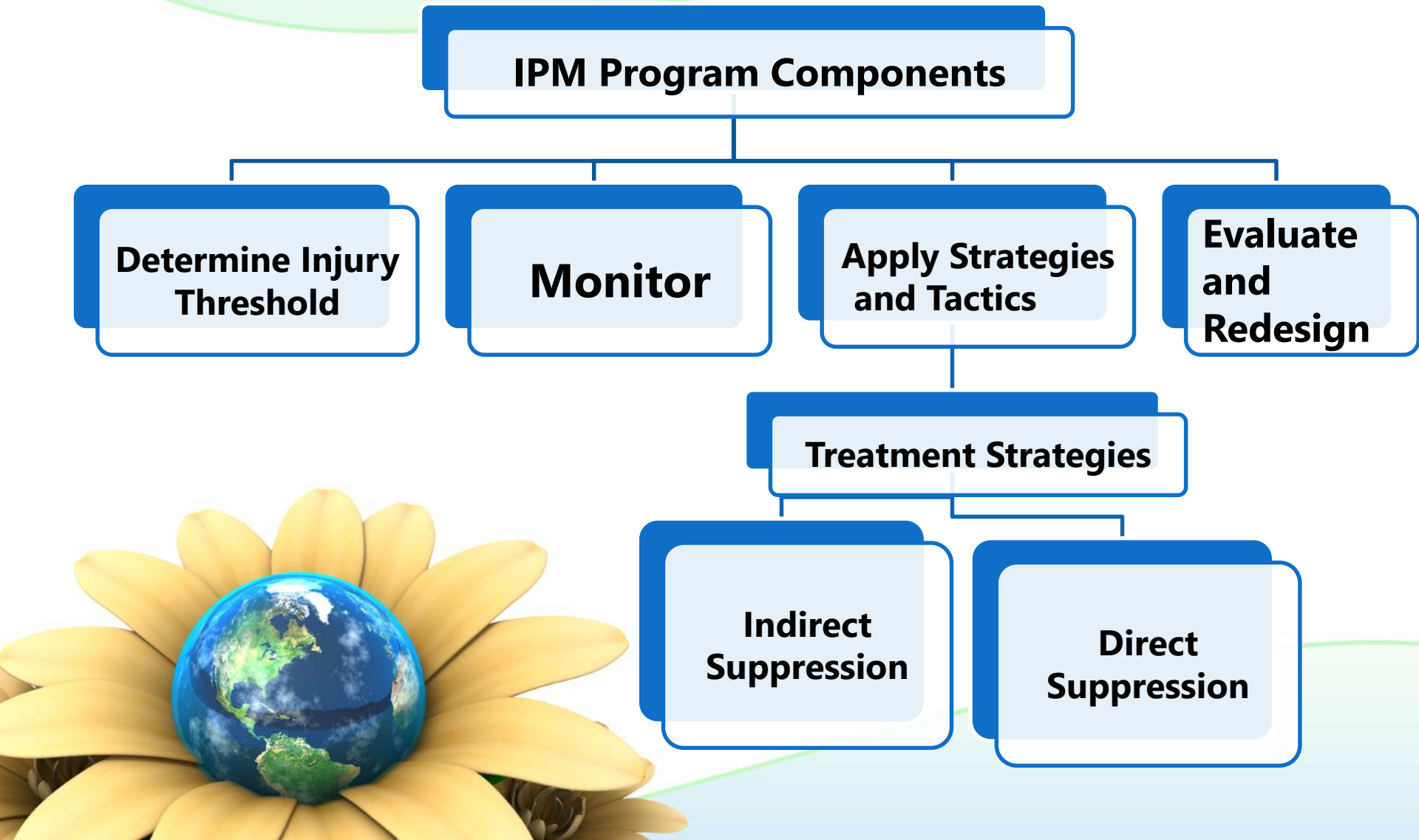
*28 species of weeds are now **resistant** to Roundup

What is IPM?

Integrated Pest Management or Insect Population Management



IPM Program Components and Their Interrelationships



Pest or Guest?

When exactly does an organism become a “pest”.

What Type of Damage is it?

- Economic
- Medical
- Aesthetic

Is the Damage Tolerable?

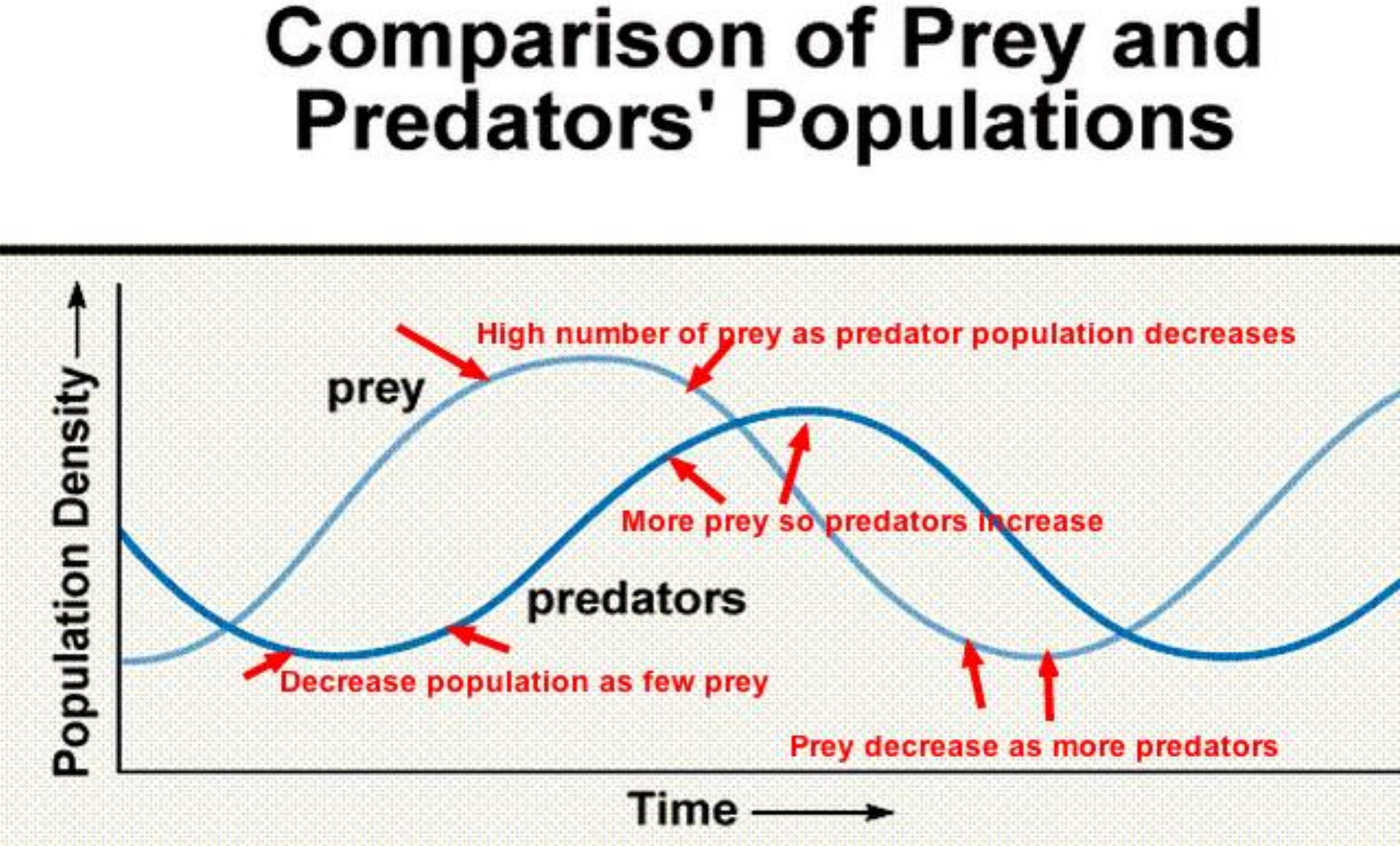
What is *Your* Threshold?

How to Determine your Damage Level Threshold

When to Take Action

- ✓ How much damage will *you* tolerate?
- ✓ How large can your pest population grow before it causes that amount of damage?
- ✓ Establish a treatment level that keeps the pest population small enough to keep damage levels in check.

Total Eradication of Pest Insects is Virtually Impossible



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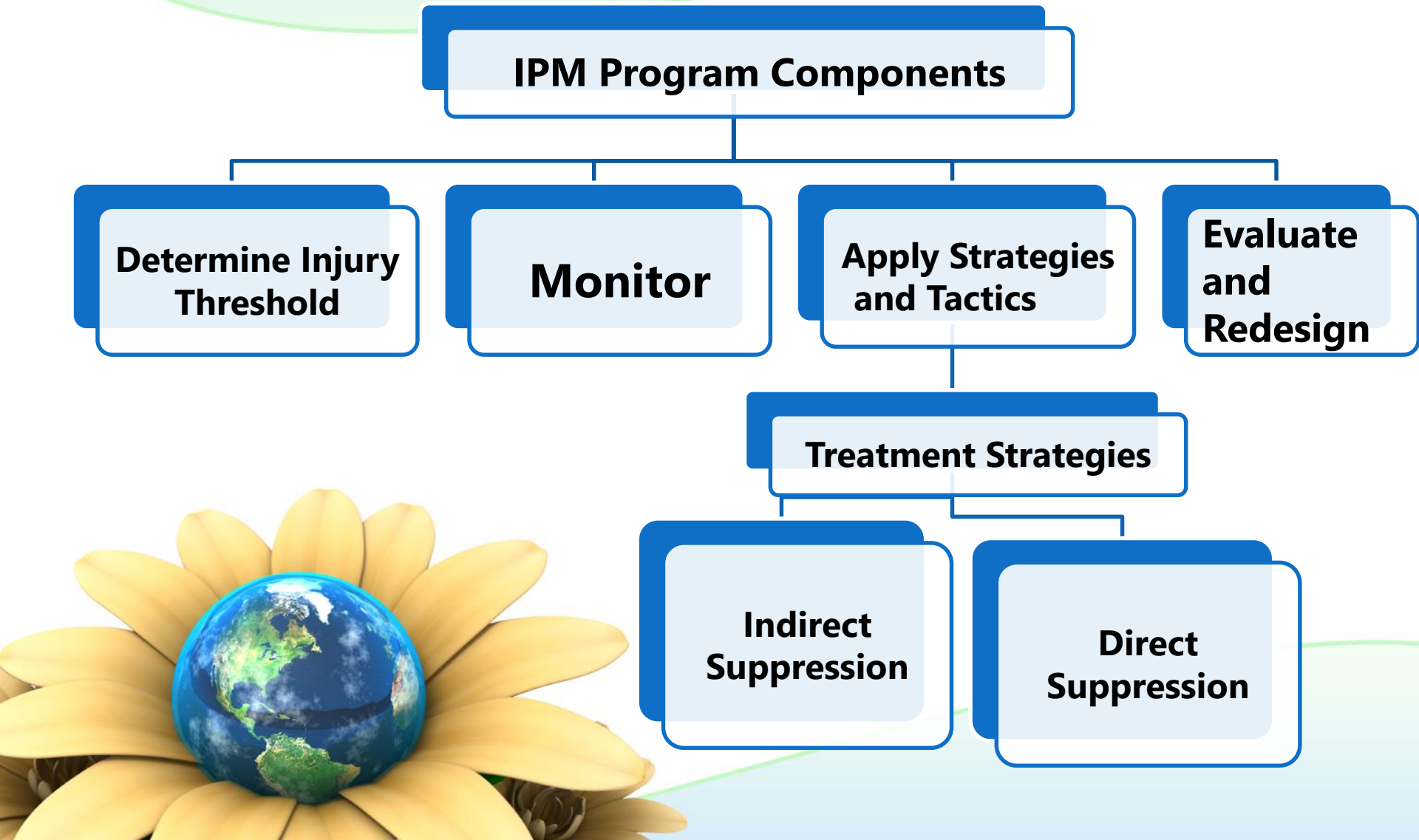


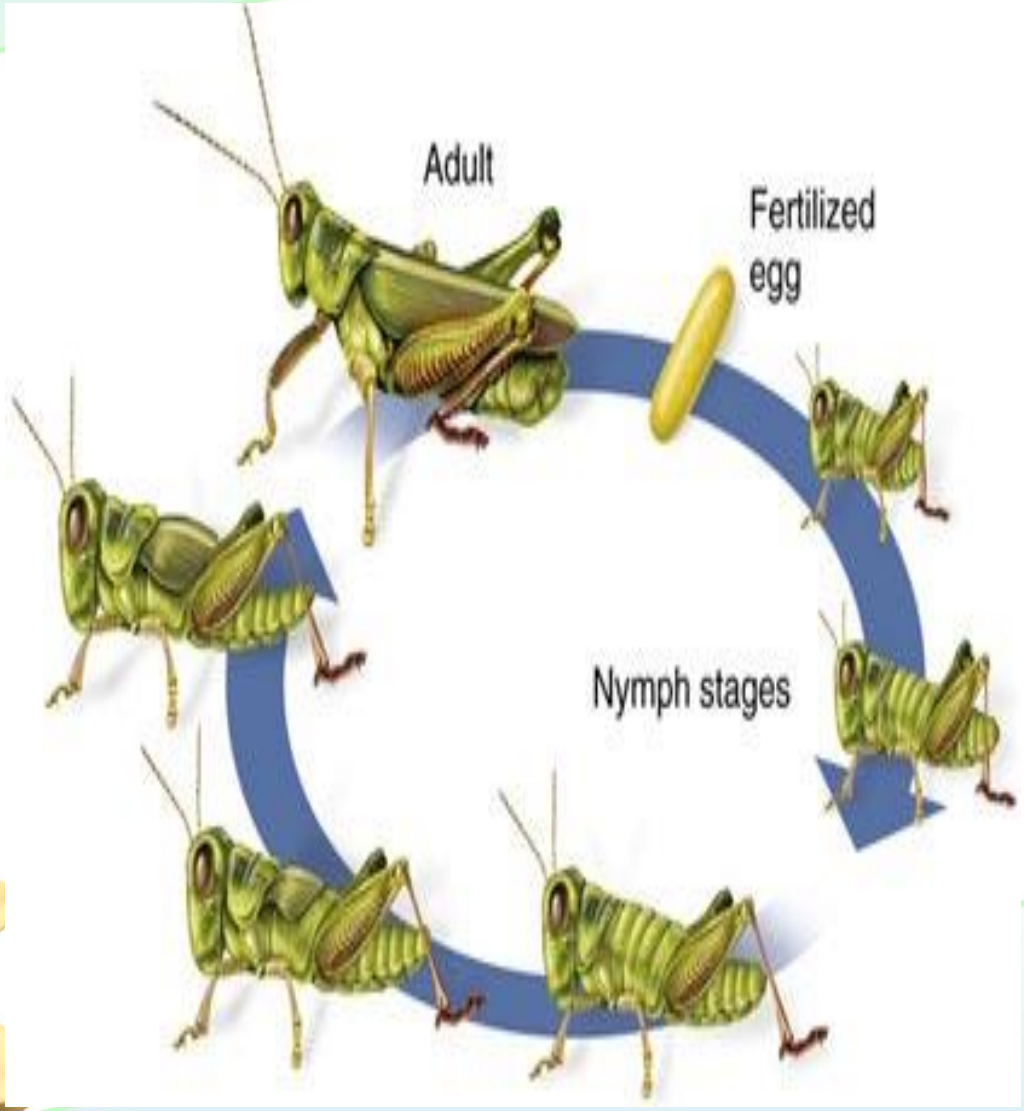
Monitor - Tools of the Trade

- Hand Lens
- Aspirator
- Sticky Traps
- Pheromone Traps
- Flashlight/Black Light
- Storage Containers
- Notebook/Journal

Insects Life Cycles

Simple Metamorphosis

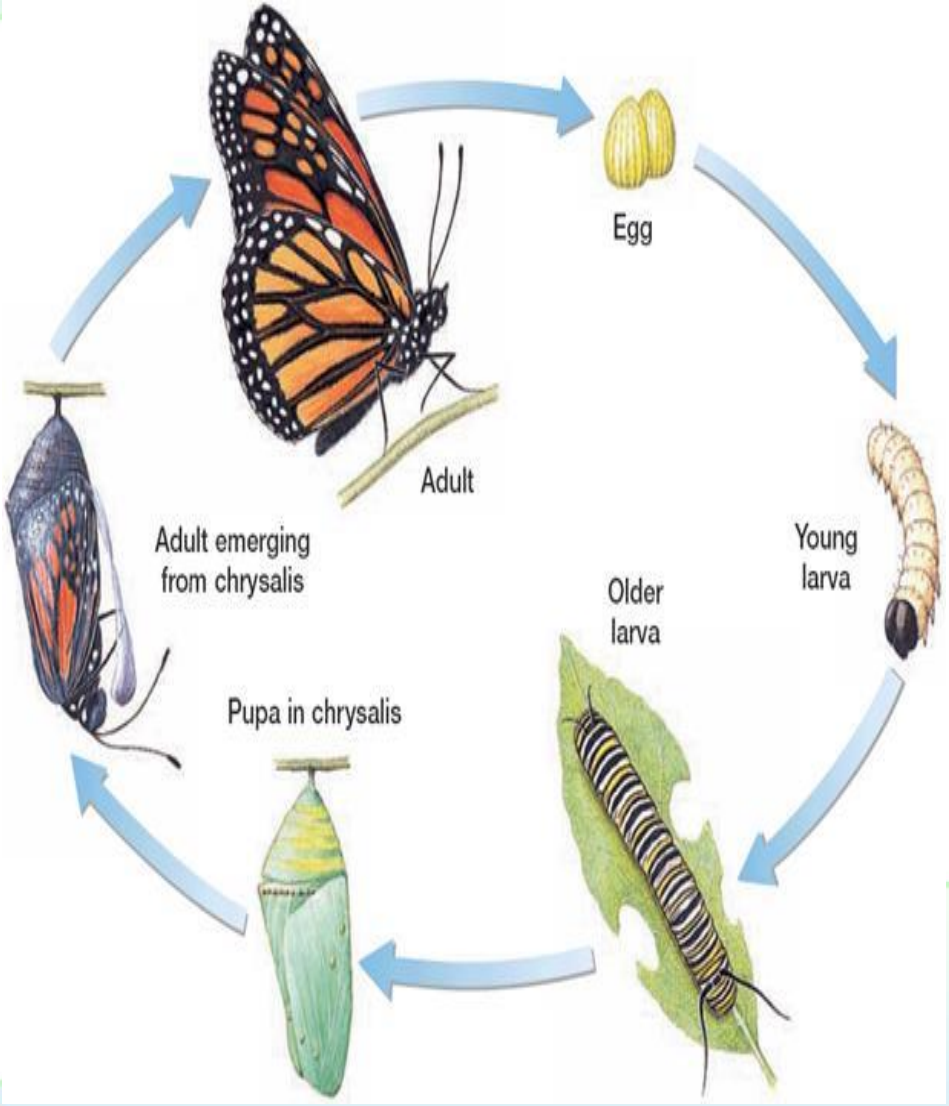
Insects with Simple or Incomplete Metamorphosis Have 3 Life Stages.



Insects Life Cycles

Complex Metamorphosis

Insects with Complex or Complete Metamorphosis Have 4 Life Stages.



How Insects Feed

Above Ground Chewing

Armyworm, Bee, Billbug, Caterpillar, Cricket, Cucumber Beetle, Cutworm, Earwig, Flea Beetle, Fruitworm, Grass Hopper, Hornworm, Leafminer, Leaf Skeletonizer, Snail & Slug, Weevil

How Insects Feed

Above Ground Sucking

Aphid, Harlequin Bug, Lace Bug, Leafhopper, Mealybug, Mite, Psyllid, Scale, Spittlebug, Squash Bug, Thrips, Whitefly

How Insects Feed

Below Ground Feeding

Beetle Grubs*, Billbug, Onion Maggot, Nematode, Root Maggot, Rootworm, Root Weevil, Wireworm

How Insects Feed

Boring Insects

Various Borers by Name Plus:

Apple Maggot, Bark Beetle, Codling Moth, Corn Earworm

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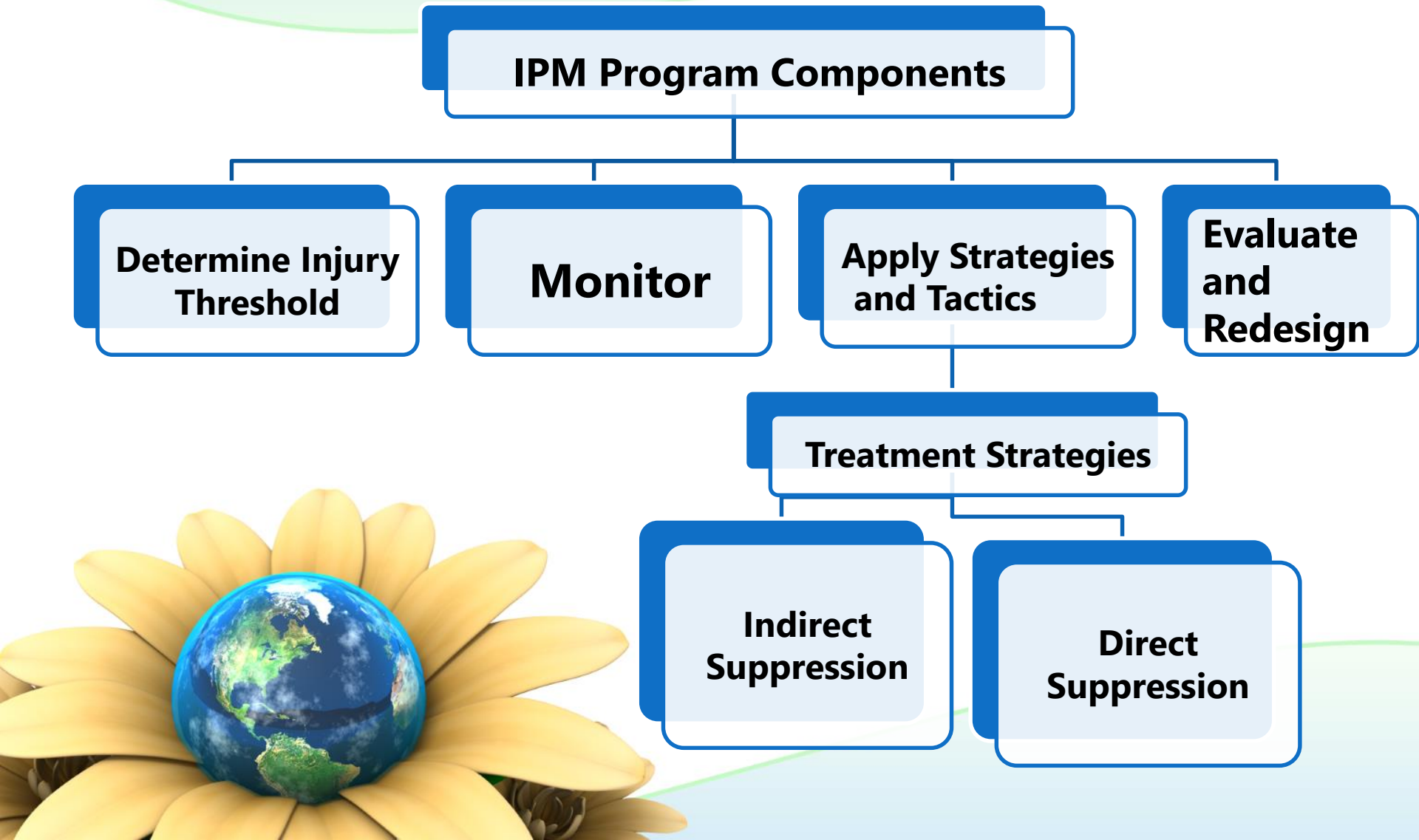
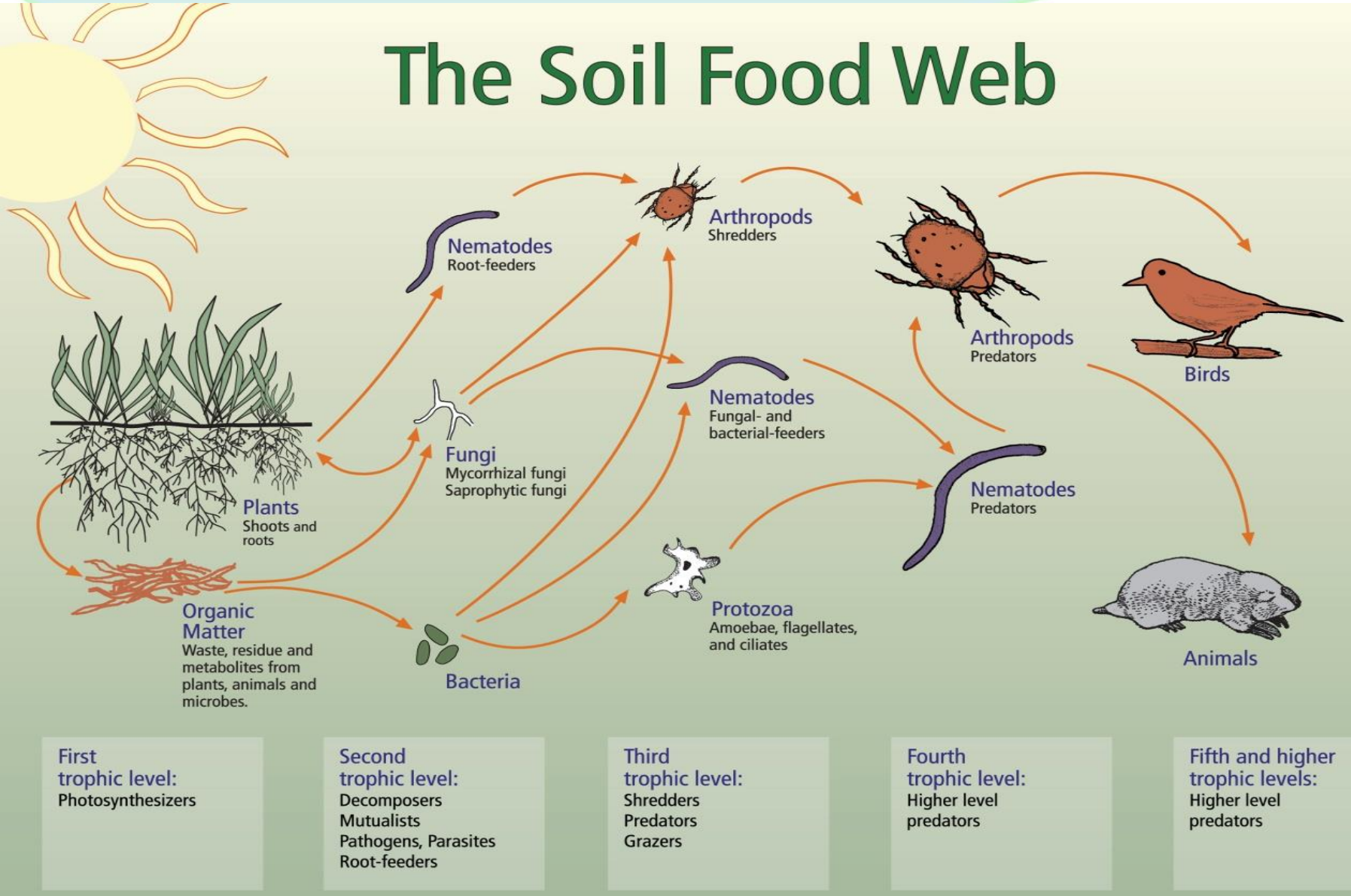


Indirect Suppression Tactics

Cultural Controls

- **Nutrition**
- **Resistant varieties**
- **Interplanting and Companion Planting**
- **Crop Rotation**
- **Enhancement of naturally occurring Biological Controls**
- **Timed Planting**
- **Mulch and Ground Covers**
- **Trap Cropping**
- **Clean Cultivation**
- **Ongoing Education**

Cultural Control Tactic 1 - Nutrition



Cultural Control Tactic 2 – Resistant Varieties

Using a plant's natural defenses against pests to your advantage

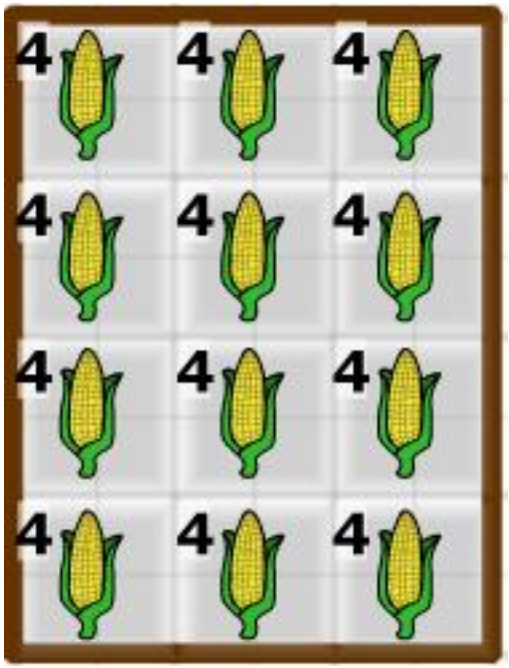
Cultural Control Tactic 3 –Interplanting

Planting Multiple Crops in Close Proximity to One Another

Cultural Control Tactic 4 – Enhancement of Naturally Occurring Biological Controls

Provide a source of food, shelter, and alternate hosts for beneficial organisms.

Cultural Control Tactic 5 – Crop Rotation



Crops in the same botanical family tend to suffer the same pest and disease problems.

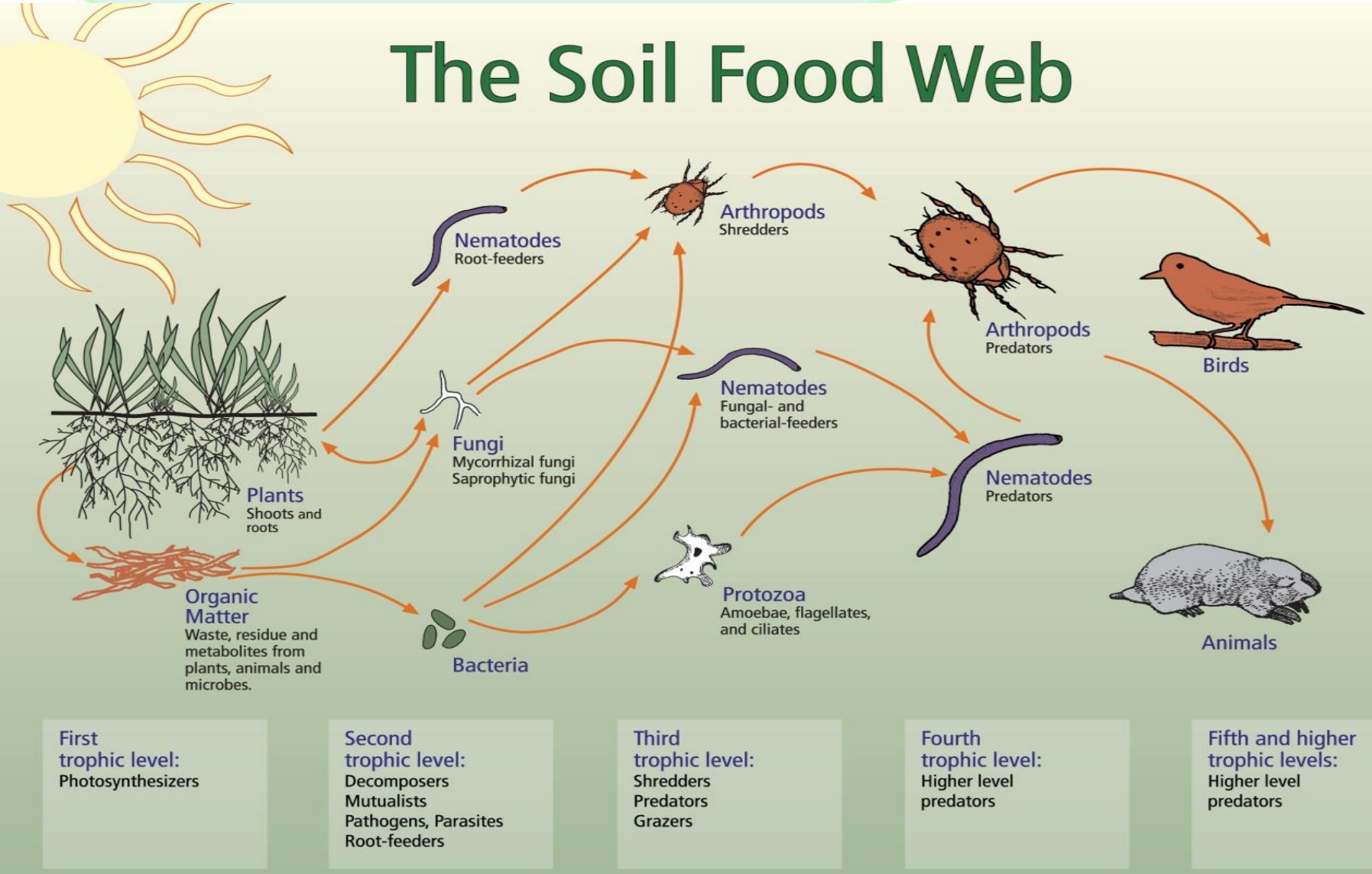
Cultural Control Tactic 6 – Trap Cropping

Use susceptible crops to attract problem insects and then destroy or trap.

Cultural Control Tactic 7 – Timed Planting

Avoid planting during time of increased feeding activity or when weather may induce stress.

Cultural Control Tactic 8 – Organic Mulch and Ground Cover



Cultural Control Tactic 9 – Clean Cultivation

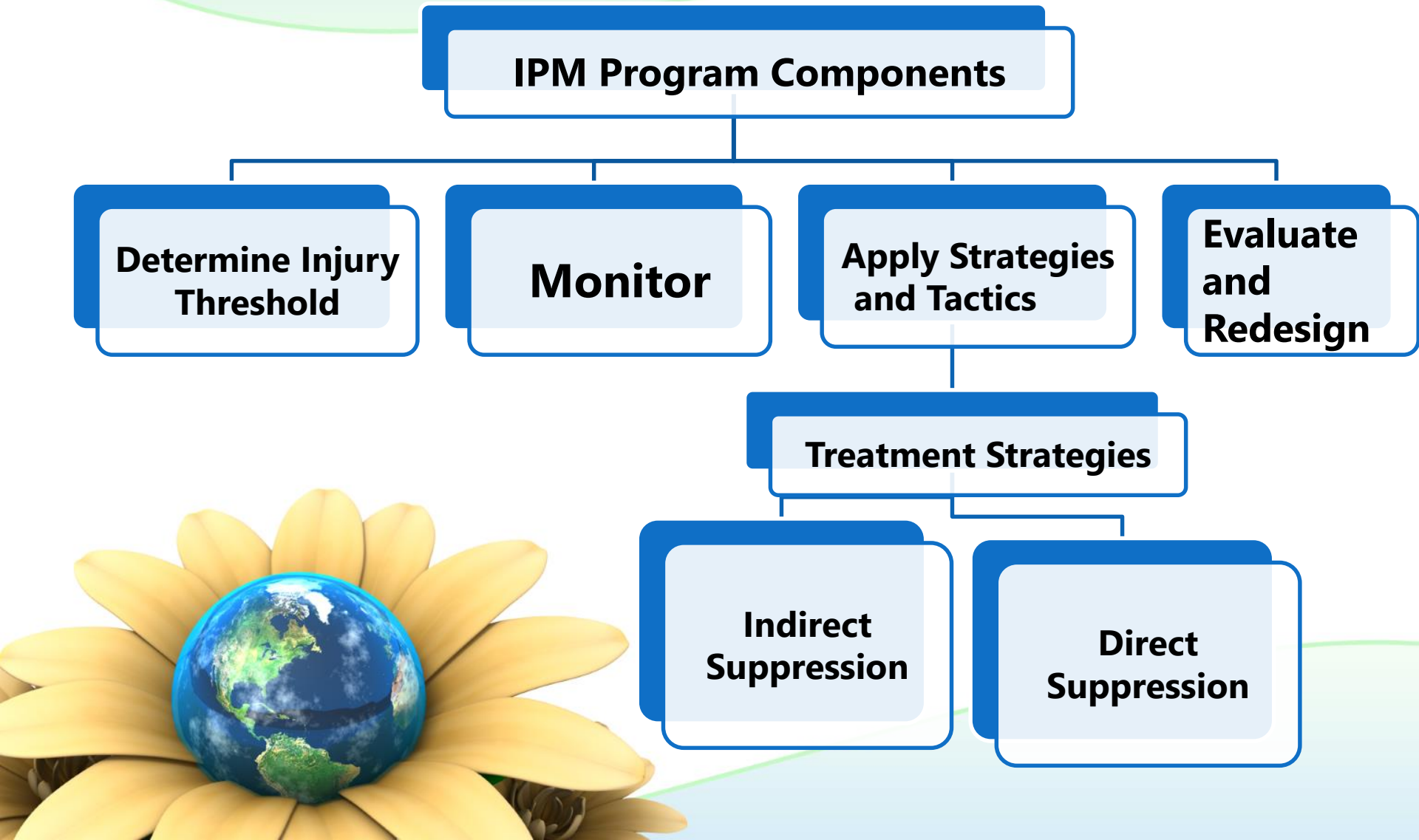
A clean garden is a healthy garden!

Cultural Control Tactic 10 – Education!

You're already here!

SOUTHWEST VICTORY GARDENS
LOCAL STARTS AT HOME

IPM Program Components and Their Interrelationships



Direct Suppression – Physical and Mechanical Controls

- Hand Picking
- Portable Vacuum Cleaner

Direct Suppression – Physical and Mechanical Controls

- Physical Barriers
- Fences and Cages
- Row Cover

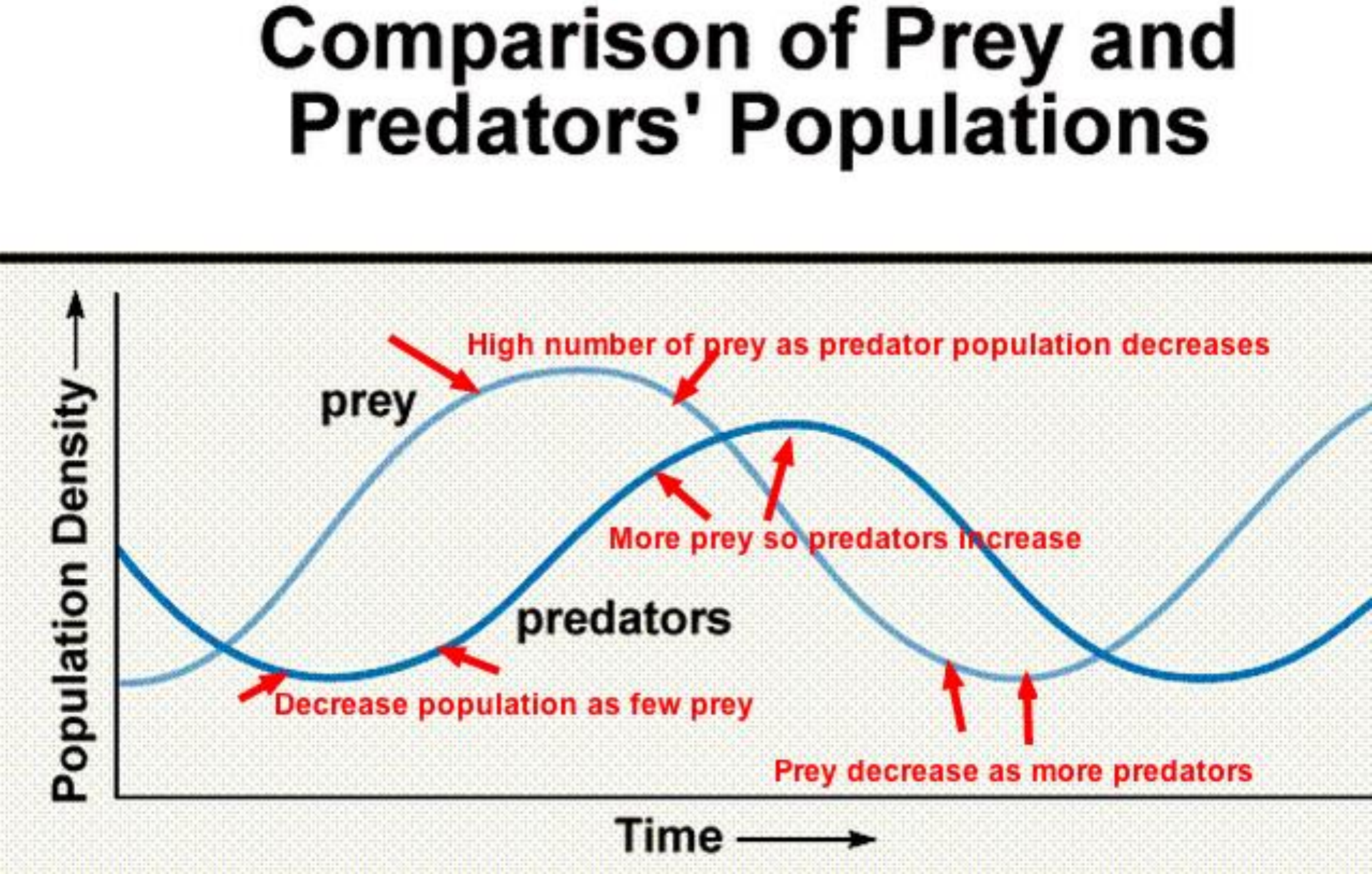
Direct Suppression – Physical and Mechanical Controls

- Sticky Traps
- Pheromone Traps

Direct Suppression – Biological Controls

- **Inundation VS.**
- **Inoculation**

Direct Suppression – Biological Controls



Direct Suppression – Biological Controls

Predatory Insects:

Assassin bugs, Lady Beetles, Mantids, Lacewings, Arachnids

Direct Suppression – Biological Controls

Parasitic Insects:

Primarily Parasitic Wasps, A large Variety of are available commercially.

Direct Suppression – Biological Controls

Birds and Animals:

Our furry and feathered friends are all part of a healthy garden ecosystem.

Direct Suppression – Microbial Controls

A variety of bacteria, fungi, viruses, and nematodes are commercially available to the home gardener:

Bacillus thuringiensis (BT)

Bacillus popilliae

Saccharopolyspora spinosa

Beauveria bassiana

Nosema Locustae

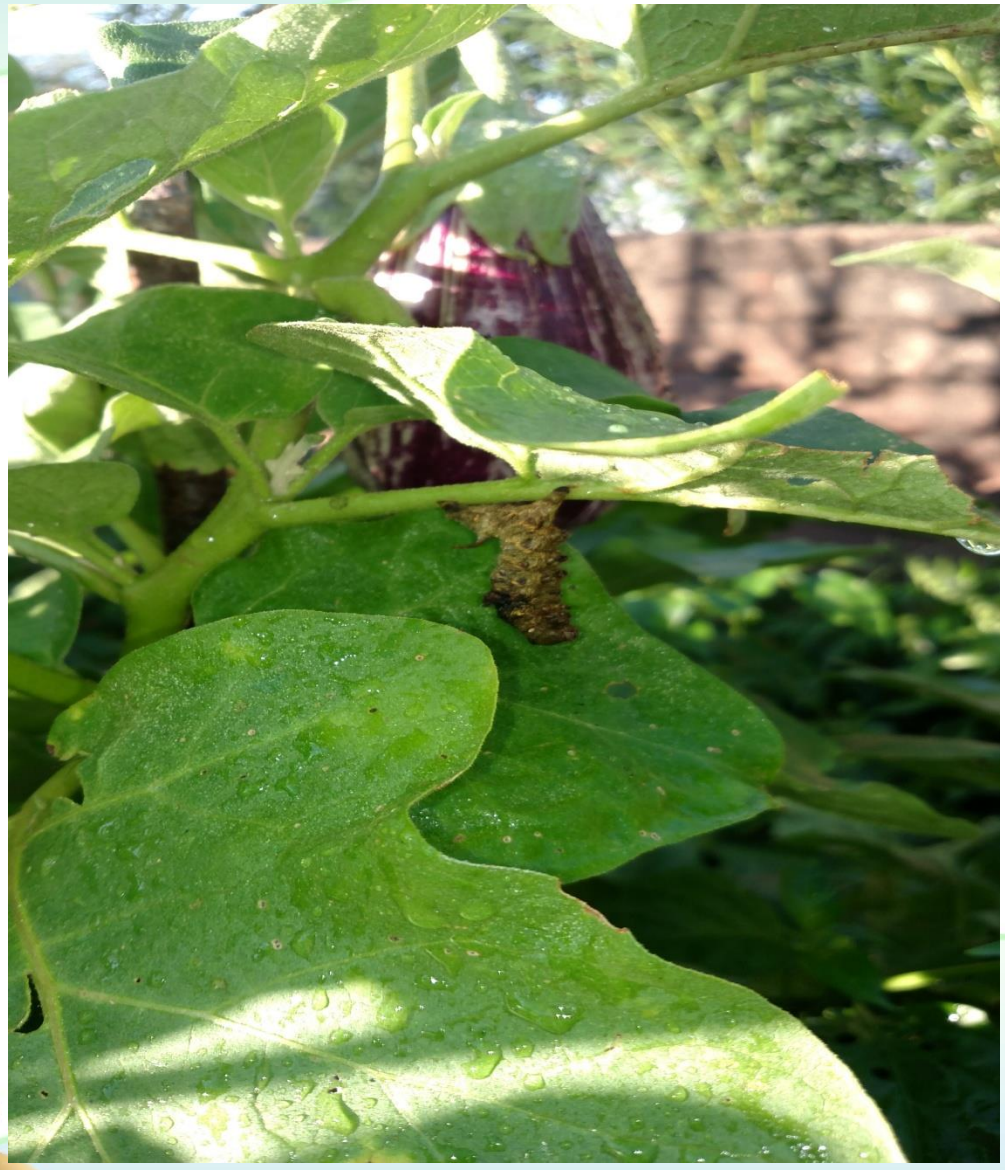
Steinernema feltiae

S. carpocapsae

Heterohabditis heliothidis

Make Your Own Microbial Control

Find an infected caterpillar, grind and mix with water. Add to your sprayer and apply to your garden. Bug Juice!



Direct Suppression – Sprays and Dusts

Sprays and Dusts are broad spectrum, contact killers that should only be used as a last resort

Repellants:

Garlic/Pepper Concentrates

Essential Oils

Homemade and Commercial

Strongly or broadly toxic sprays and dusts:

Water

Insecticidal Soap

Neem

Dormant Oils

DE

Pyrethrum

Sulfur/Copper

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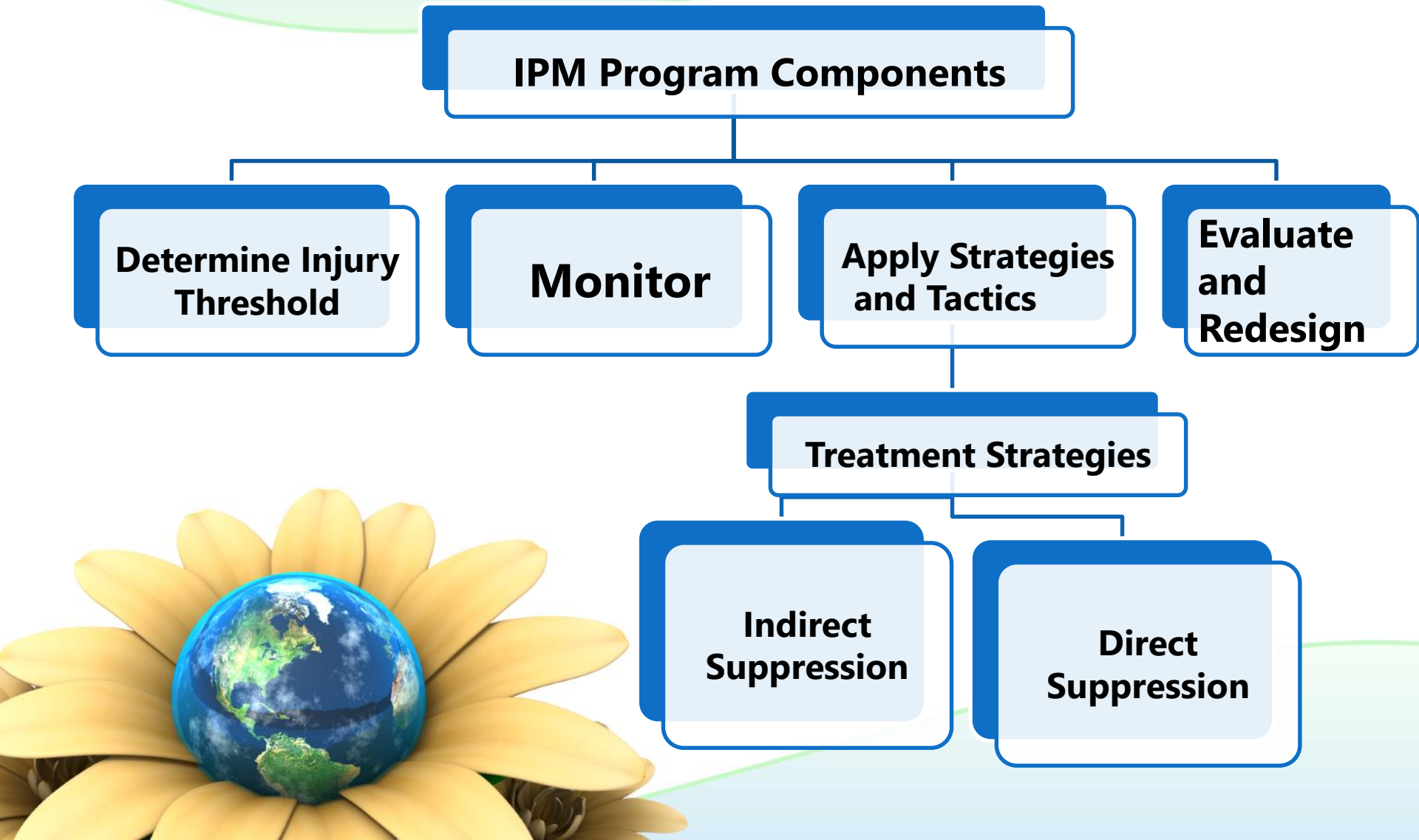

Evaluate and Improve

- What worked?
- What didn't?
- What can you do different?
- How can you make it easier for next year?

In Conclusion

There is no Silver Bullet

Your Garden is a Complex ecosystem

Use Sprays and Dusts only as a Last Resort

Thanks for coming!