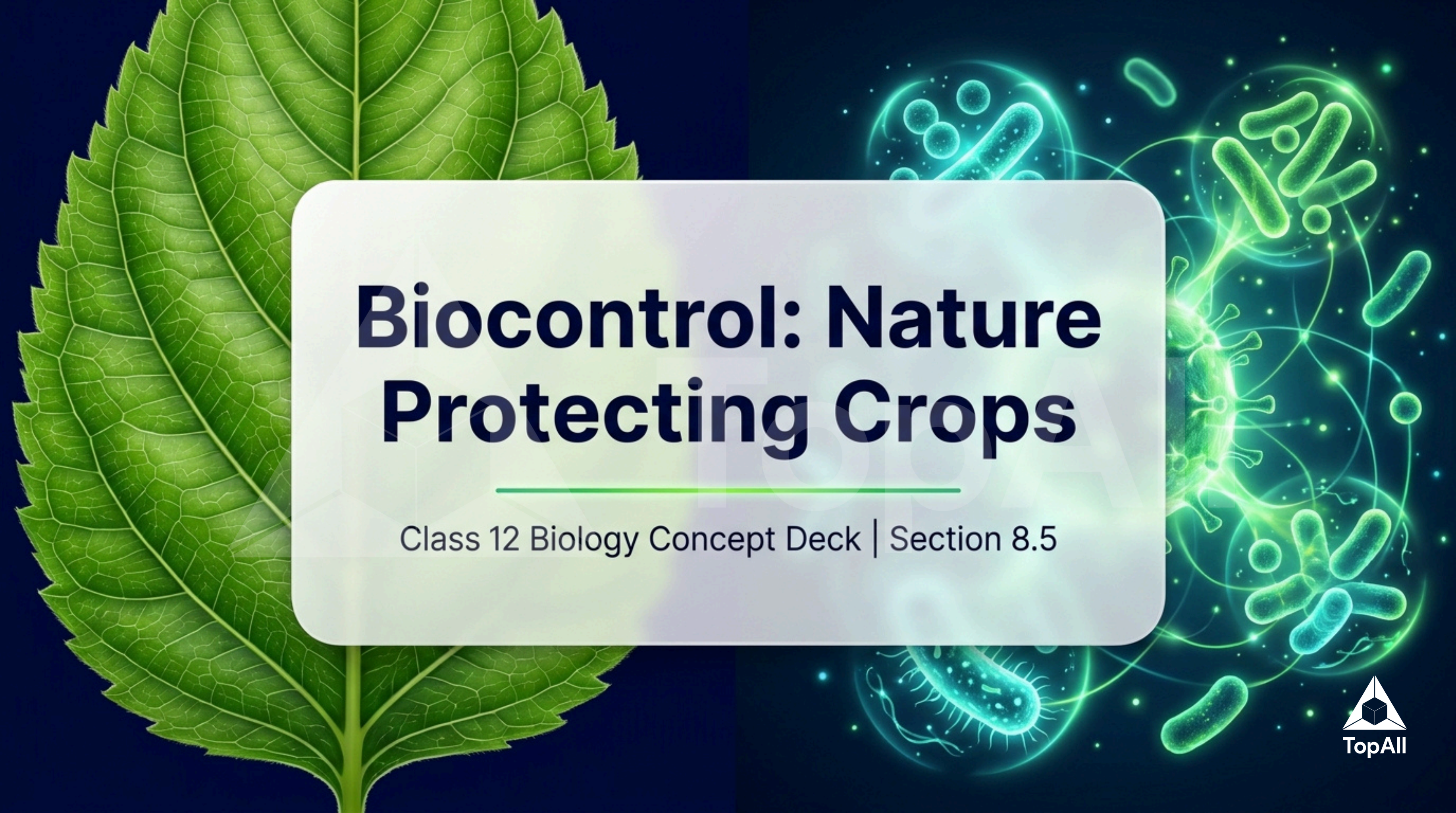




Biocontrol: Nature Protecting Crops

Class 12 Biology Concept Deck | Section 8.5



What is Biocontrol?

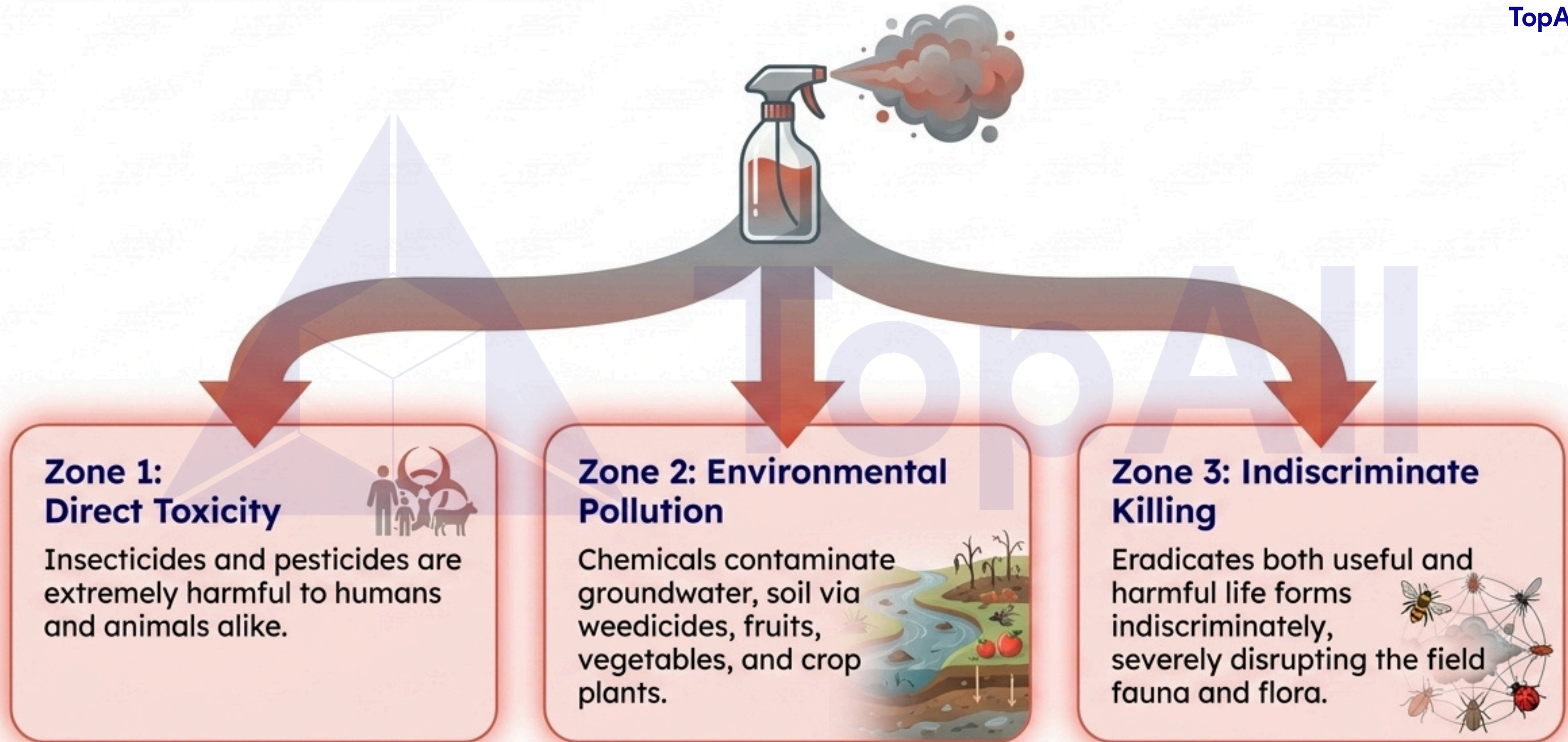


The use of biological methods for controlling plant diseases and pests.

A paradigm shift: Relying on natural predation and complex ecosystem interactions rather than toxic chemical eradication.

Natural Predation > Introduced Chemicals

The Chemical Crisis





You've Learned the Theory. Let's Test Them Now.

$$E=mc^2$$



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- » Get Clear Explanations, Not Just Marks
- » Track Your Performance Smarter



The Organic Philosophy: Biodiversity Furthers Health

Conventional Myth



Goal

Eradicate all pests.

Result

Beneficial predators and parasitic insects starve, lacking food or hosts to survive.

Organic Reality



Goal

Keep pests at manageable levels.

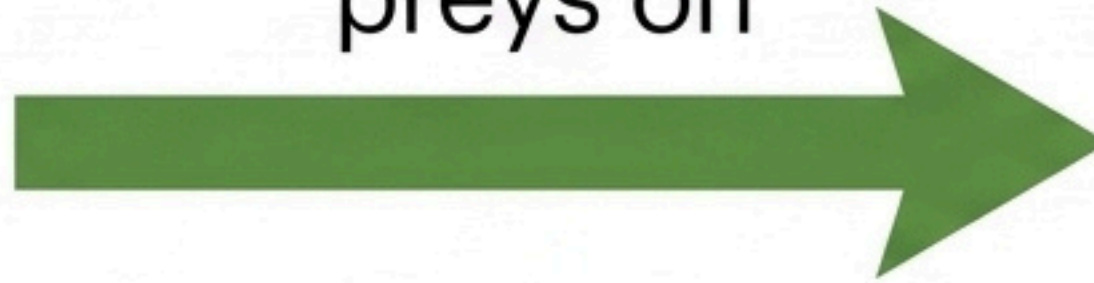
Result

Creates a complex system of checks and balances within a living, vibrant ecosystem.

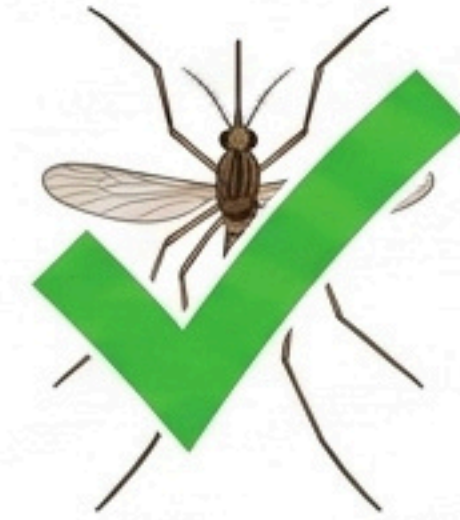
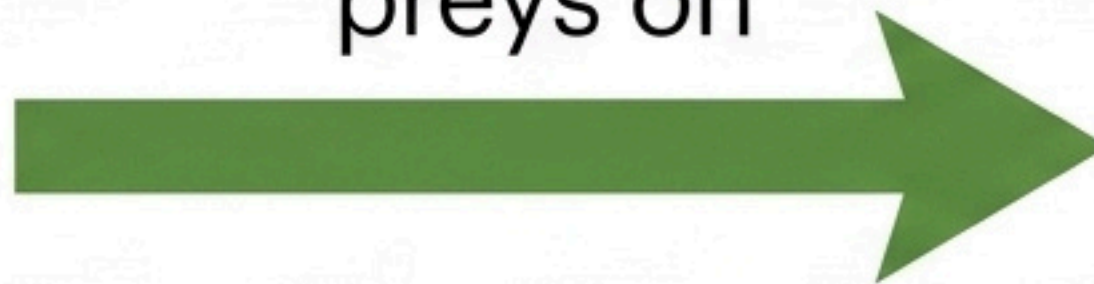
Macroscopic Biocontrol Agents



preys on

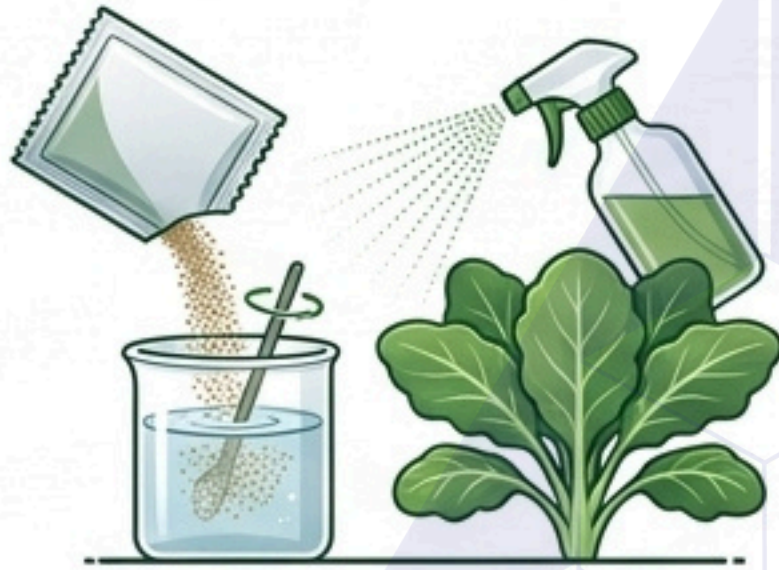


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Micro-Targeting with *Bacillus thuringiensis* (Bt)

1. Application



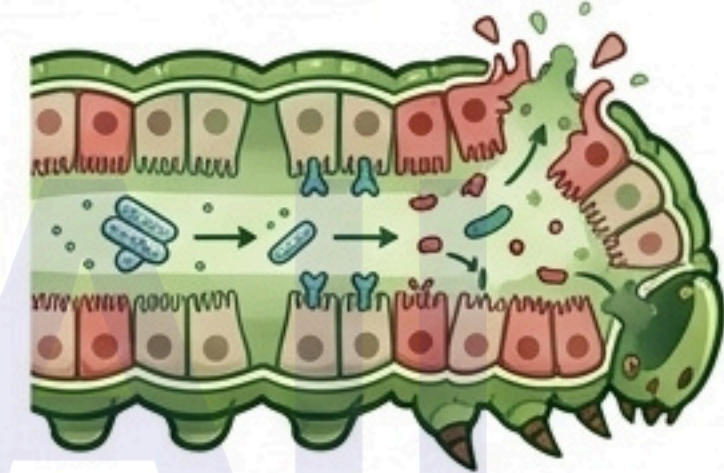
Dried spores in sachets are mixed with water and sprayed onto vulnerable plants.

2. Ingestion



The microscopic spores are eaten by butterfly caterpillar larvae.

3. Elimination



The toxin is released in the larval gut, killing the caterpillar.

Crucial Trait: Leaves other insects completely unharmed.
(Note: Scientists have now introduced Bt toxin genes directly into plants, creating pest-resistant crops like Bt-cotton).

Microbial Arsenal: Fungi vs. Viruses

Fungi: Trichoderma



Free-living fungi highly common in root ecosystems.

Highly effective biocontrol agents against several plant pathogens.

Viruses: Baculoviruses



Pathogens that specifically attack insects and other arthropods.

Excellent candidates for species-specific, **narrow spectrum** insecticidal applications.

No negative impact on plants, mammals, birds, fish, or non-target insects.

Ideal for **Integrated Pest Management (IPM)** programs or ecologically sensitive areas.

Section 8.5 Synthesis & Exam Takeaways



Key Paradigm:
Organic farming
relies on maintaining
pests at manageable
levels rather than
striving for complete
eradication.

**Biocontrol greatly reduces our
dependence on toxic chemicals
and pesticides by leveraging
natural predation and
ecosystem balance.**



Macro-Agents:
Ladybirds control
aphids; Dragonflies
control
mosquitoes.



Micro-Agents: *Bacillus thuringiensis* (Bt), *Trichoderma*
fungi, and *Baculoviruses* offer precision targeting
without harming the broader ecosystem.



You've Learned the Theory.

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