



Beyond Pest Control: Rethinking Plant Protection for a Changing World

From changing pest landscapes and early warning to integrated and biologically based pest management

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A CHANGING AGRICULTURAL WORLD



- Climate change
- Global trade
- Agricultural intensification
- Changing landscapes

Pests are not responding to our management plans. They are responding to the environment.

THE PEST LANDSCAPE IS CHANGING

- Pest distribution, abundance, timing and damage are changing.
- Familiar pests may behave differently.
- Yesterday's pest distribution may not reflect tomorrow's risks.
- Monitoring helps anticipate problems and guide better decisions.



THREE CASE STUDIES, ONE MESSAGE

Case	What it illustrates
<i>Eurygaster</i> spp.	Monitoring & population dynamics
<i>Lissorhoptrus oryzophilus</i>	Early detection & emerging threats
Aphids & thrips in pepper	Agroecosystem interactions

UNDERSTAND → ANTICIPATE → MANAGE

Eurygaster spp. in wheat

***Eurygaster* spp.** – important cereal pests.

Monitoring focuses on density, distribution and seasonal dynamics.

Monitoring should support timely management decisions, not just collect data.

Surveillance leads to better understanding and that ultimately leads to better decisions.



MONITORING $\neq$ COUNTING

WHERE?

HOW MANY?

WHEN?

HOW FAST?

WHAT DOES IT MEAN?

FROM DETECTION TO DECISION



1 **Detection**

2 **Monitoring**

3 **Assessment**

4 **Targeted intervention**

Lissorhoptrus oryzophilus Kuschel

Lissorhoptrus oryzophilus Kuschel –
example of an emerging pest threat.
We need to know where it is, how it
spreads, and whether populations
increase.
Early detection gives us time and
more management options.



**Early detection does not eliminate risk.
It increases our options for managing risk.**

EARLY DETECTION = TIME

- Plant protection is a race against time.
- Early detection enables monitoring, risk assessment and timely action.
- Early warning systems create decision time.
- Act early to prevent local problems from becoming major threats.

Pepper agroecosystems

Pepper production and its relationship between weeds, aphids and thrips.

Weeds are not only competitors — they can provide food, shelter and alternative hosts.

The field should be viewed as an agroecosystem.

Instead: **How do we control the aphid or the thrips?**

We can ask: **What ecological factors are influencing their occurrence in the first place?**



FROM PEST – CENTERED TO SYSTEM – CENTERED THINKING

OLD QUESTION

- How do we kill the pest?

NEW QUESTION

- Why is the pest successful here?
- ↓
- Can we change the conditions?



FROM PEST CONTROL TO IPM

1

Prevent

4

Decide

2

Monitor

5

Manage

3

Assess

6

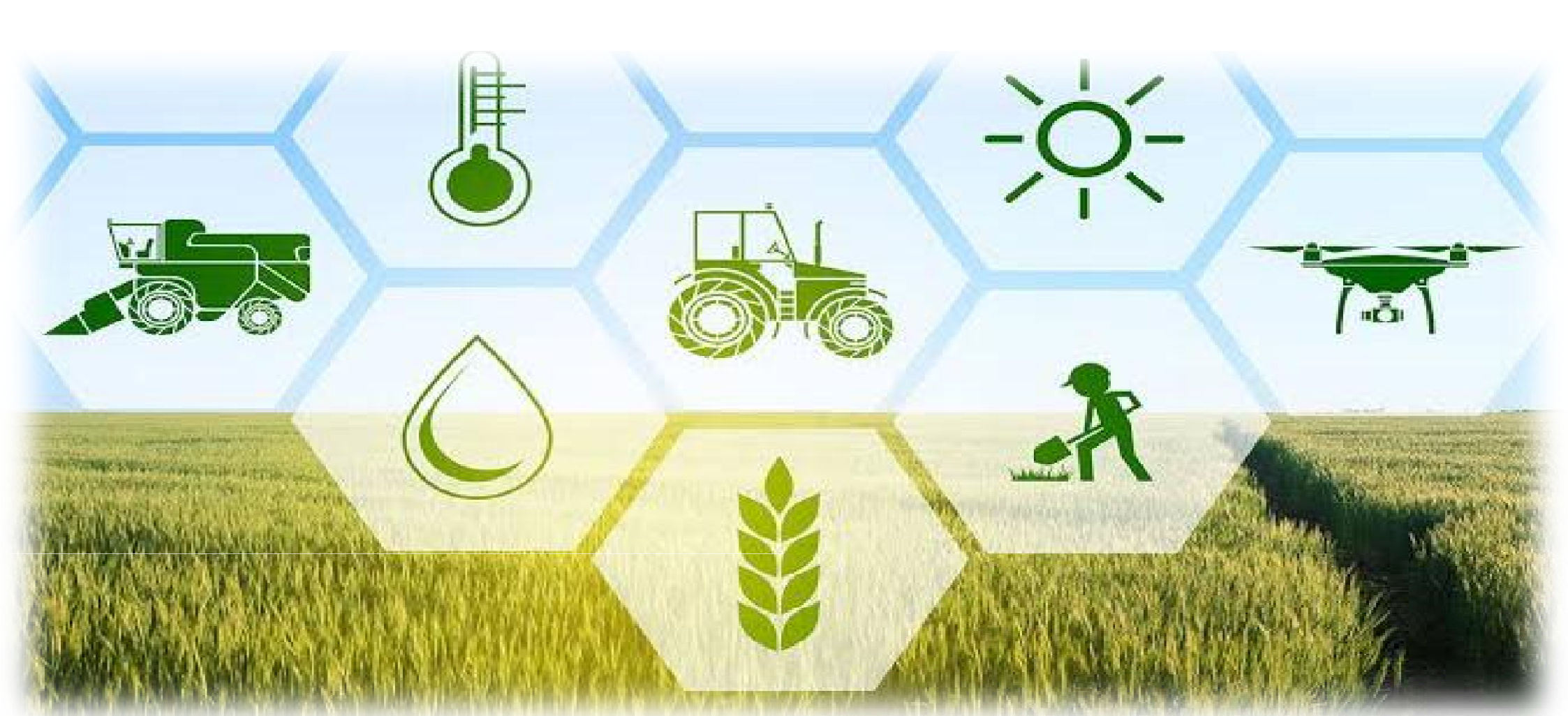
Evaluate

BIOLOGY MUST RETURN TO THE CENTER

- Pests are part of ecosystems
- Natural regulation matters
- Support natural enemies
- Design pest-resilient systems
- Biological control ≠ pesticide replacement
- Strengthen ecosystem resilience

BIOLOGY + ECOLOGY





TECHNOLOGY: TOOL, NOT SOLUTION

Sensors | Drones | Remote sensing | AI | Precision application

BIOLOGY + DATA + TECHNOLOGY

THE PLANT PROTECTION SYSTEM OF THE FUTURE



FOUR CHANGES WE NEED TO MAKE

FROM	TO
Reactive	Preventive
Uniform	Site – specific
Input – based	Knowledge – based
Pest – centered	System – centered

BEYOND PEST CONTROL

- From reaction



prevention

- From control



management

- From isolated tools



integrated systems



UNDERSTAND EARLIER | DECIDE BETTER | MANAGE MORE SUSTAINABLY

THANK YOU FOR YOUR ATTENTION!

