

Case studies of Integrated Pest Management (IPM)

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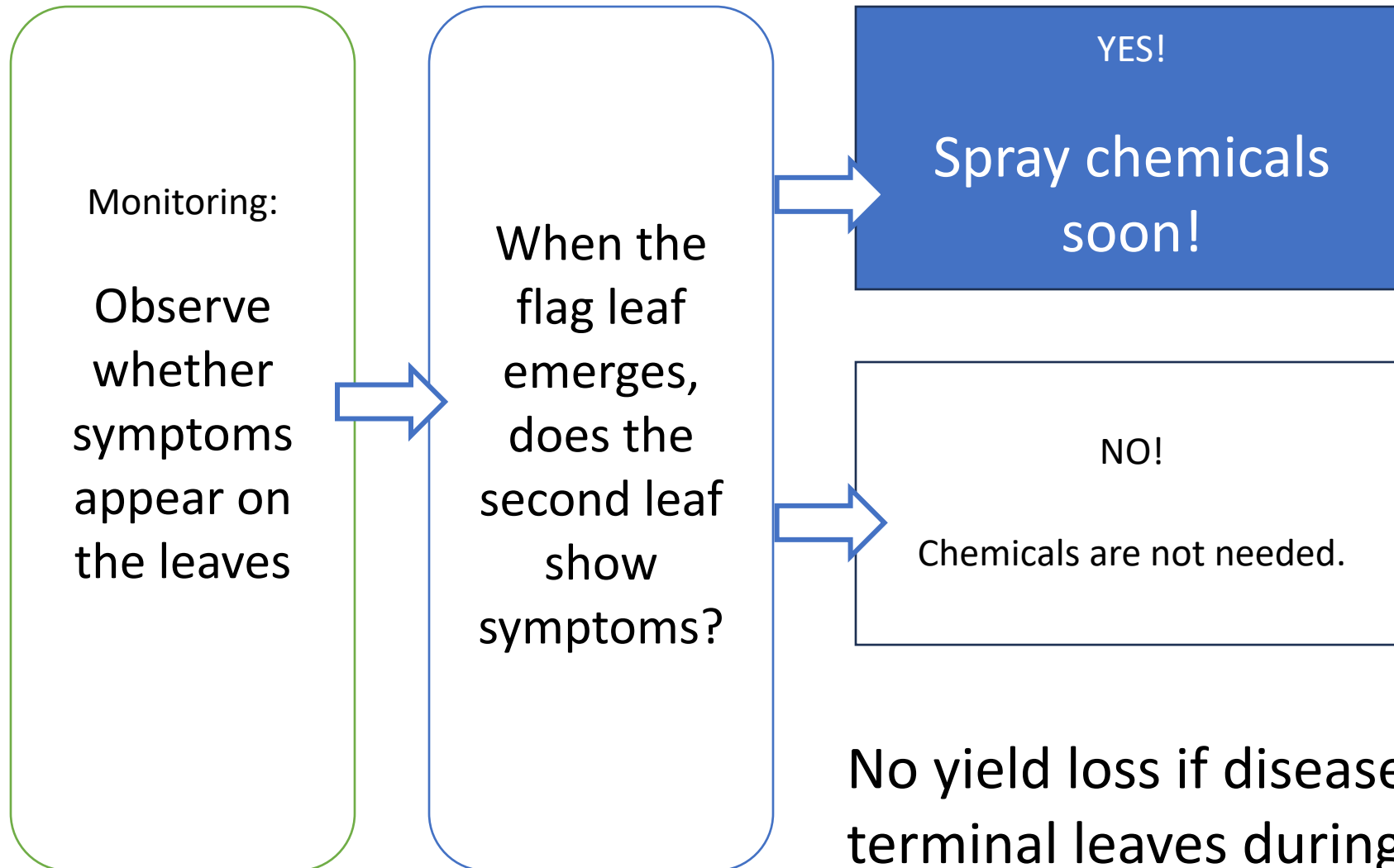
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Powdery mildew on Wheat

(Pathogen is a fungus.)



No yield loss if disease incidence on
terminal leaves during flowering is $< 50\%$.

Rice leaf beetle on Rice

- No pesticide needed if populations are low
- Check egg masses
- Threshold: 1–2 egg masses per plant
- 1 or fewer → no control
- 2 or more → apply pesticide (early larval stage)



Conduct the egg mass survey on approximately 20 to 30 plants within the rice field and calculate the average value.

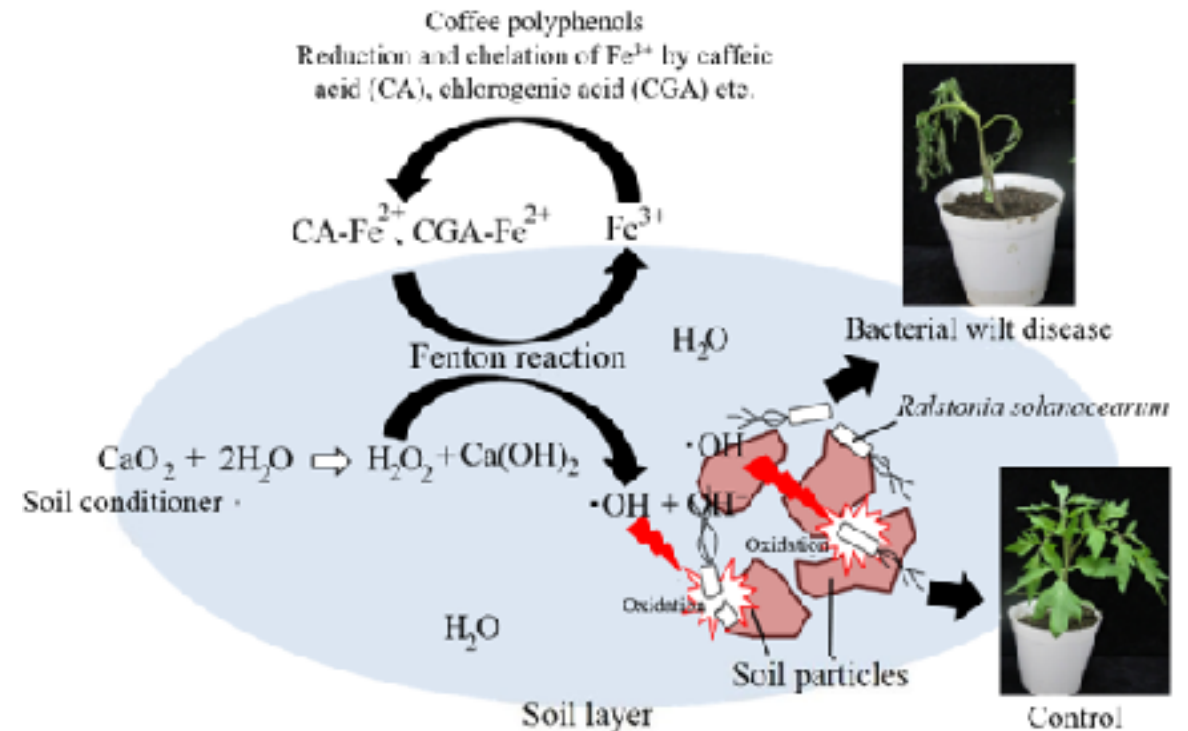
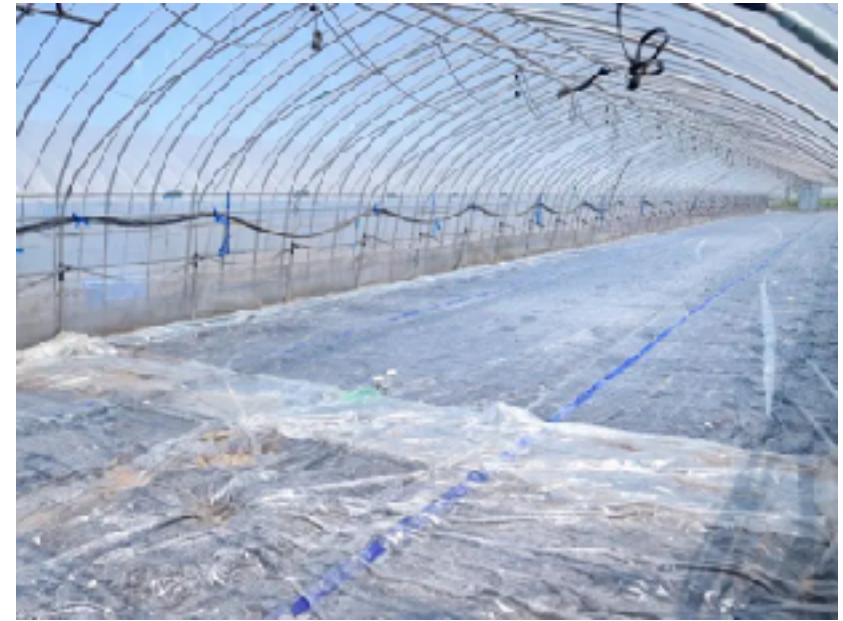
←Egg masses



Eggs and a larva

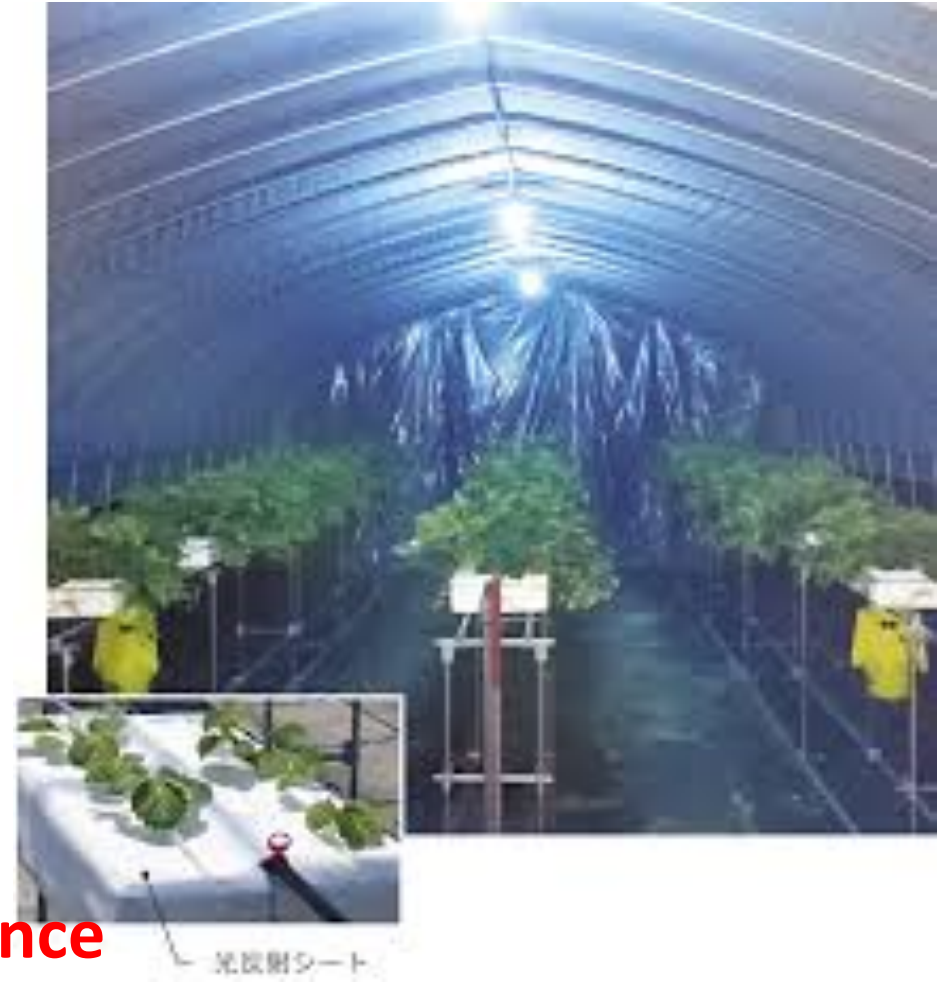
Soil Reduction Sterilization (Greenhouse)

- Mix organic materials (rice bran, wheat bran, molasses, etc.) into soil
- Irrigate and cover with plastic → block air, keep soil hot
- Microorganisms multiply → consume oxygen
- Creates oxygen-depleted soil → **kills soil-borne pathogens (bacterial wilt, brown root rot, nematodes)**



Ultraviolet irradiation: Powdery mildew and spider mite on Strawberry (Greenhouse)

- UV-B lights on ceiling (3h/night)
- Reflecting sheets under seedlings
- Release predatory mites at start
- Pesticides only if mites surge in summer
- UV lights prevent powdery mildew



UV-B damages spider mite DNA → kills them

UV-B activates plants → increases disease resistance

UV-B reduces powdery mildew spore germination

Ultraviolet irradiation: Bean Weevil on Soybean (Open field)

- Wavelength: 448–458 nm
- Disrupts moth behavior and reproduction by interfering with light–dark rhythm
- Start 1 week after flowering to avoid affecting growth
- Irradiate 3 PM – 7 AM, late July to late August
- Less effective in continuous cropping fields

