Potato tuber moth at Java
Phthorimaea operculella

- vegIMPACT NL – Indonesia Kenhose

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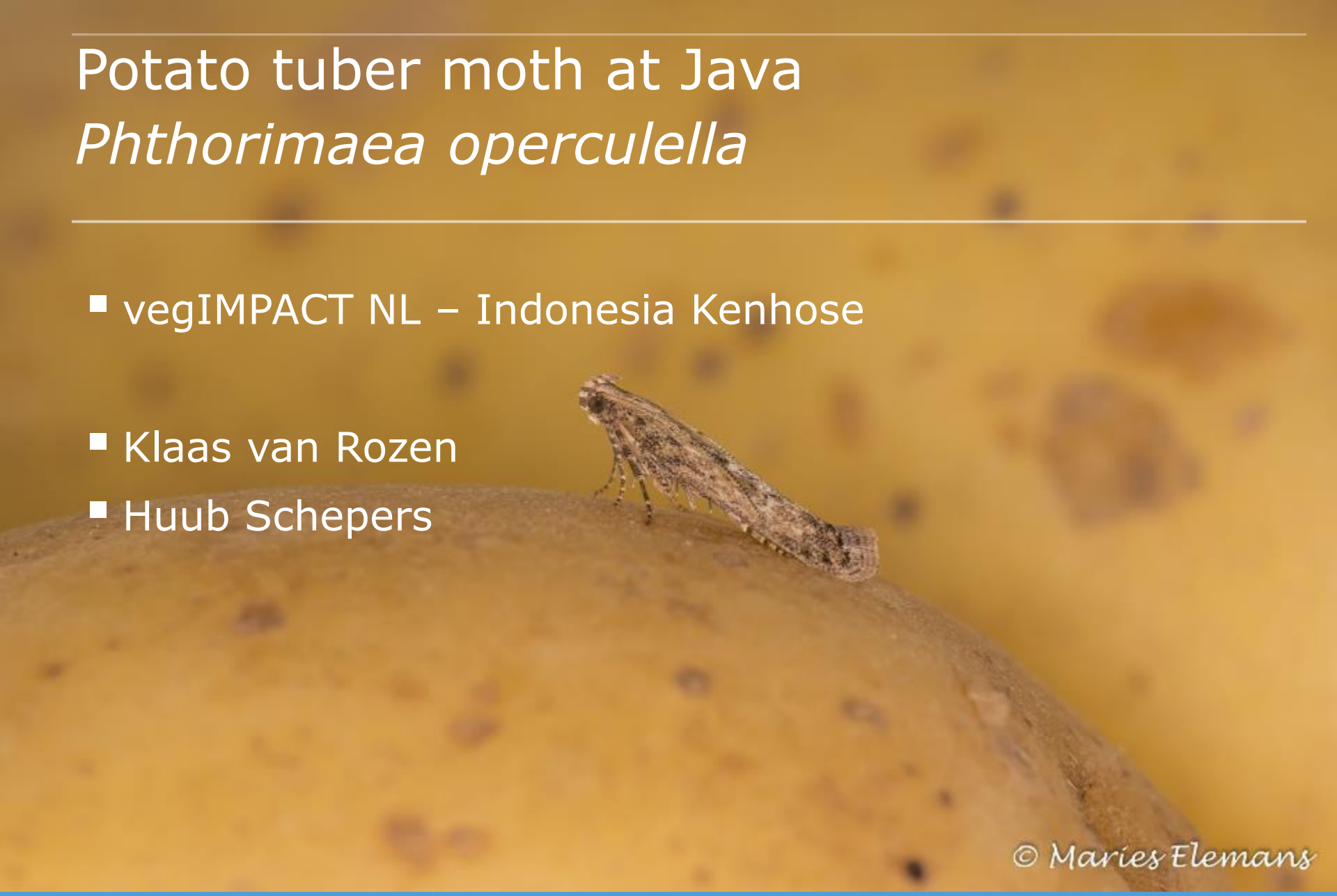


Potatoes: life-cycle in the field

Potatoes: life-cycle in the storage

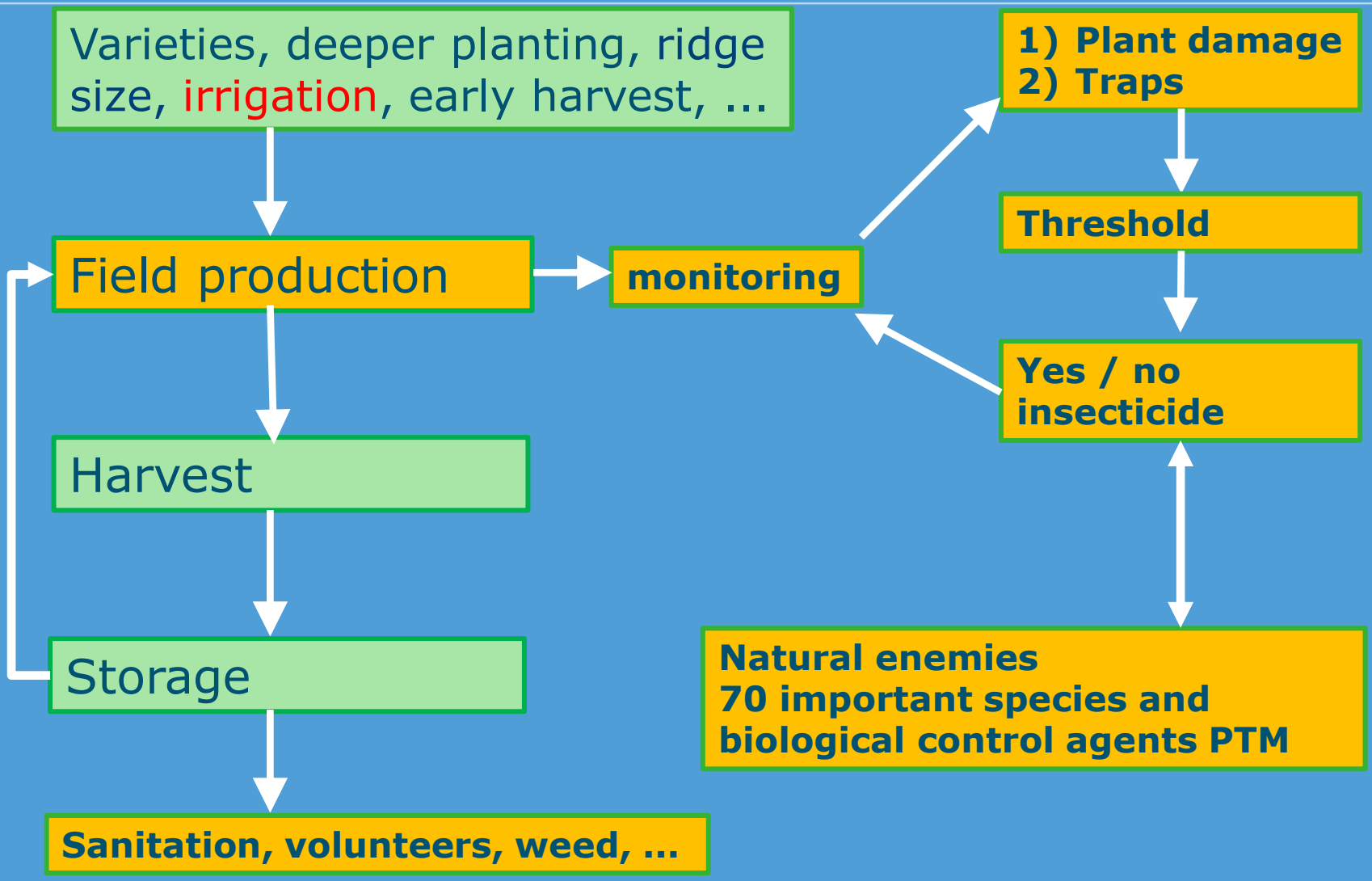
Objectives

1. Develop and design of GAP/IPM to control Potato Tuber Moth (*Phthorimaea operculella*).
    - Current and new practices to control PTM
        - Field
        - Post-harvest
    - Minimal input of synthetic insecticides
2. Describe a roadmap to the development/implementation of a biological product
    - success depends on point 1!

Kenhose

- Discussion of the production chain and PTM biology:
  - State of the Art
  - Points of control action
- Field visits

Potato production & IPM – critical phase?



Waiting for the nocturnal PTM

Conclusions from field visits

- Few moths, damage, caterpillars, eggs:
  - Insecticide strategy Kenhose farmers sufficiënt
  - PTM pest density?
  - Effect natural enemies?
  - New fields, converting nature into agriculture:
    - Impact natural enemies?
    - Impact insecticides?

Natural army



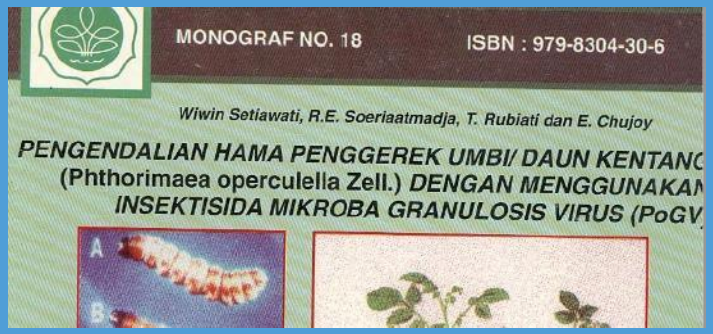






Insecticide potential

Insecticide	Active ingredient	Water life	Soil life	Groundwater	Pollinators	Natural enemies
NeemAzal-T/S / Oikos	azadirachtin				A	A
Tracer	spinosad				B	C
CoStar WG / DiPel DF	Bacillus thuringiensis subsp. kurstaki				A	A
Steward	indoxacarb				B	B
Altacor	chlorantraniliprole				A	A
Vertimec Gold / Vectine Plus	abamectin				B	C
Tutavir	granulovirus PhopGV*				A	A



* granulovirus against Tuta selected from PTM

A	IPM
B	Limited usable
C	Not usable

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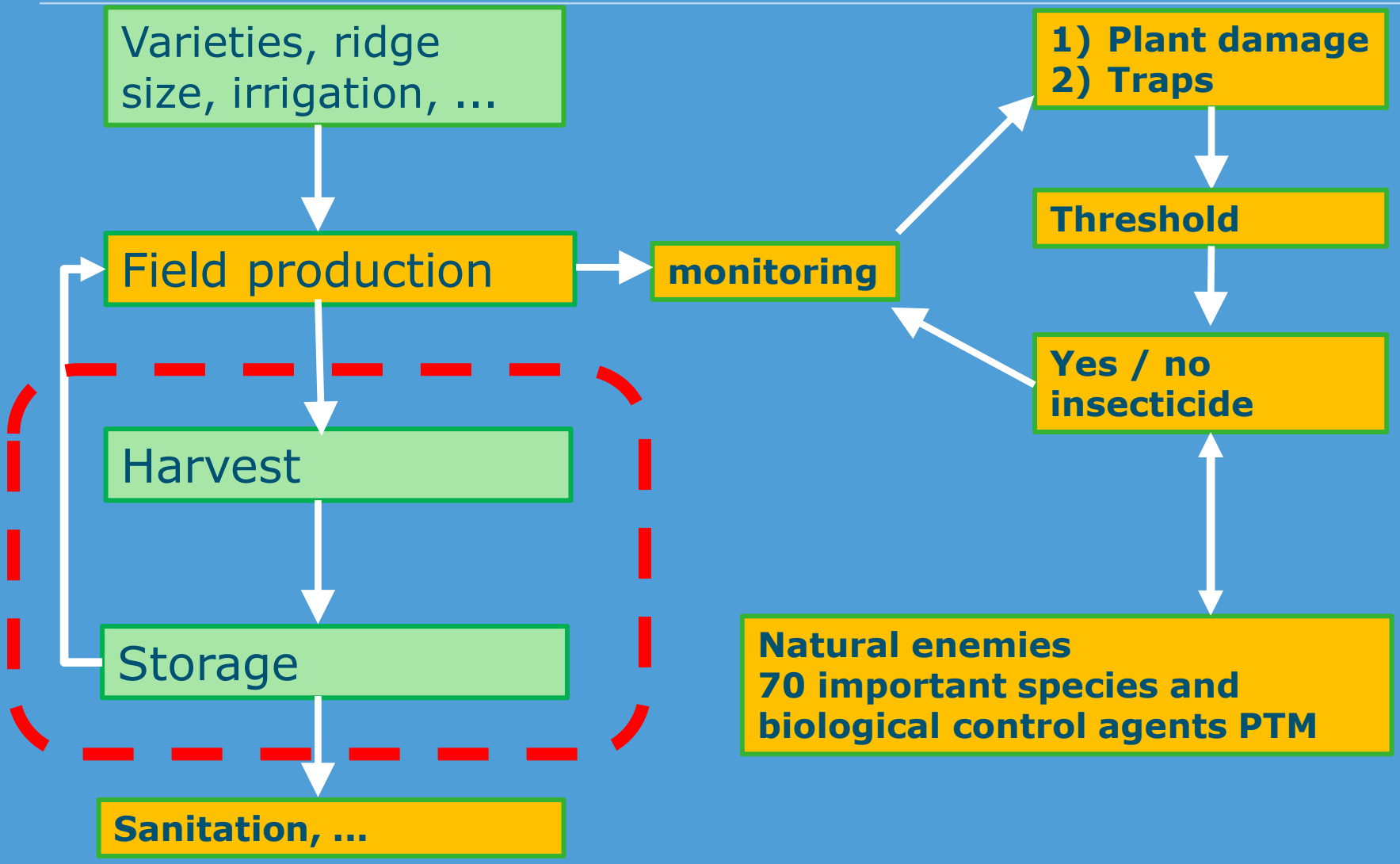
Influence solanaceae weeds and tomatoes?

- Rotation – spatial and temporal dynamics
- Adults do not oviposit in the soil close to tubers if potato foliage is available
    - Spatial and temporal harvesting per field
    - Potato plants should be larval free at harvest!

Production & IPM – critical phase East-Java



Harvest

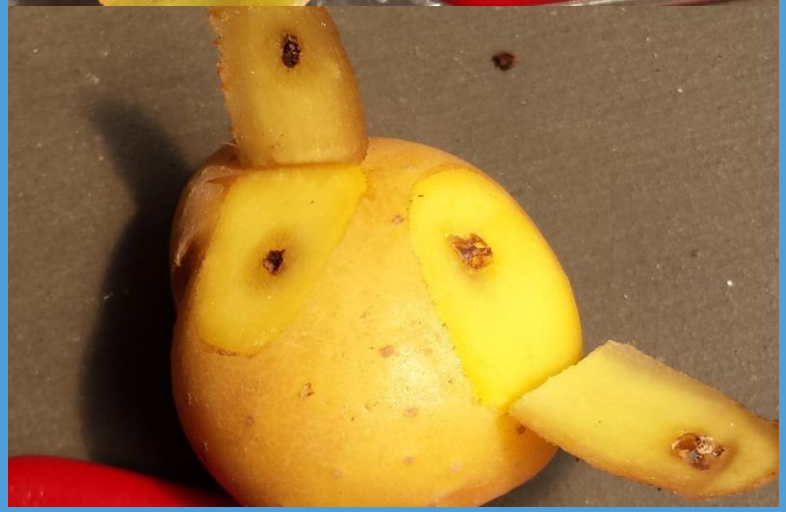
- New Zealand
  - Primarily a field pest
  - Cooled conditions PTM no risk
  - Natural storage in the soil, year round fresh potatoes – PTM sensitive
  - Damage in field after defoliation >2 weeks

- United States
  - No store problems (T regulated)
  - From out of 50 stores 1 with severe PTM densities: from a heavily infested field

Ridges

- Robust ridges at Kenhose potatoes
- August 2019: 150 exposed, green potato tubers no eggs observed

20 July harvest farmer, 8 August -> Kenhose 1.8% PTM

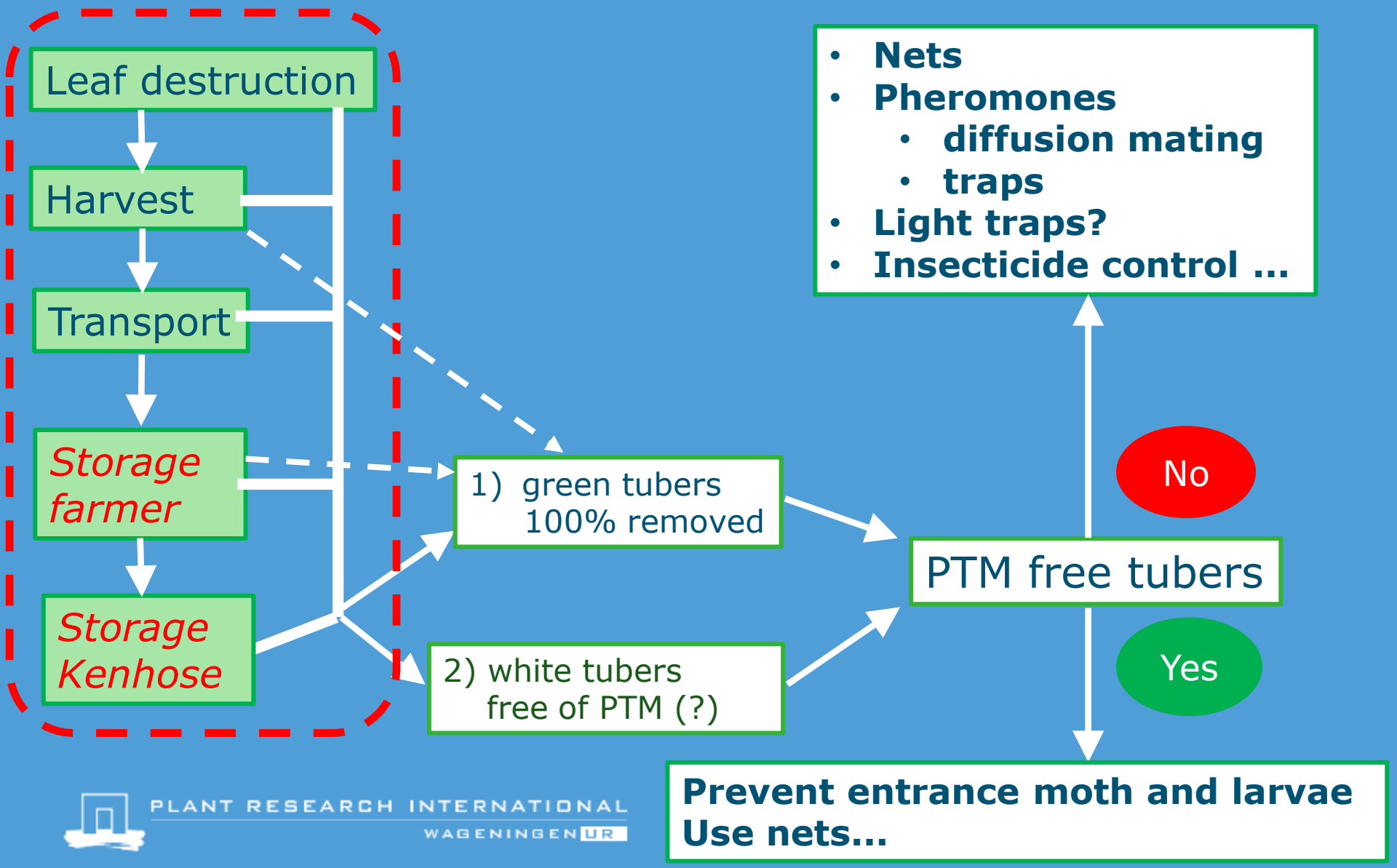


14 August tuber check end L2/L3

Infestation: eggs after harvest

Re-sorting ~14 days after harvest

Critical phase: optimizing IPM



Experience in Tanzania

- Nets (0,75 x 1,00 mm)
- Natural ventilated stores (nets in the door)
- Diffused Light Store (DLS), pre-germination, nets
- Extra traps with light, electric and pheromones
- Both stores no PTM (with outside PTM pressure)

Recommendation Kenhose IPM step by step

- *Current situation: stable*
  - *Control in the field and store*
  - *IPM is (partly) carried out!*
- Field
  - Stimulating natural enemies - identification
  - Selective insecticides – Btk, azadirachtin
- Harvest & storage
  - Quick and clean harvest - sanitation
  - Netting (0,75 x 1,00 mm) & cooling (<10°C)
  - Selective insecticides – Btk, granulovirus
- Population dynamics