

# Influences of Pesticide Residue on attaining Food Security in Mauritius



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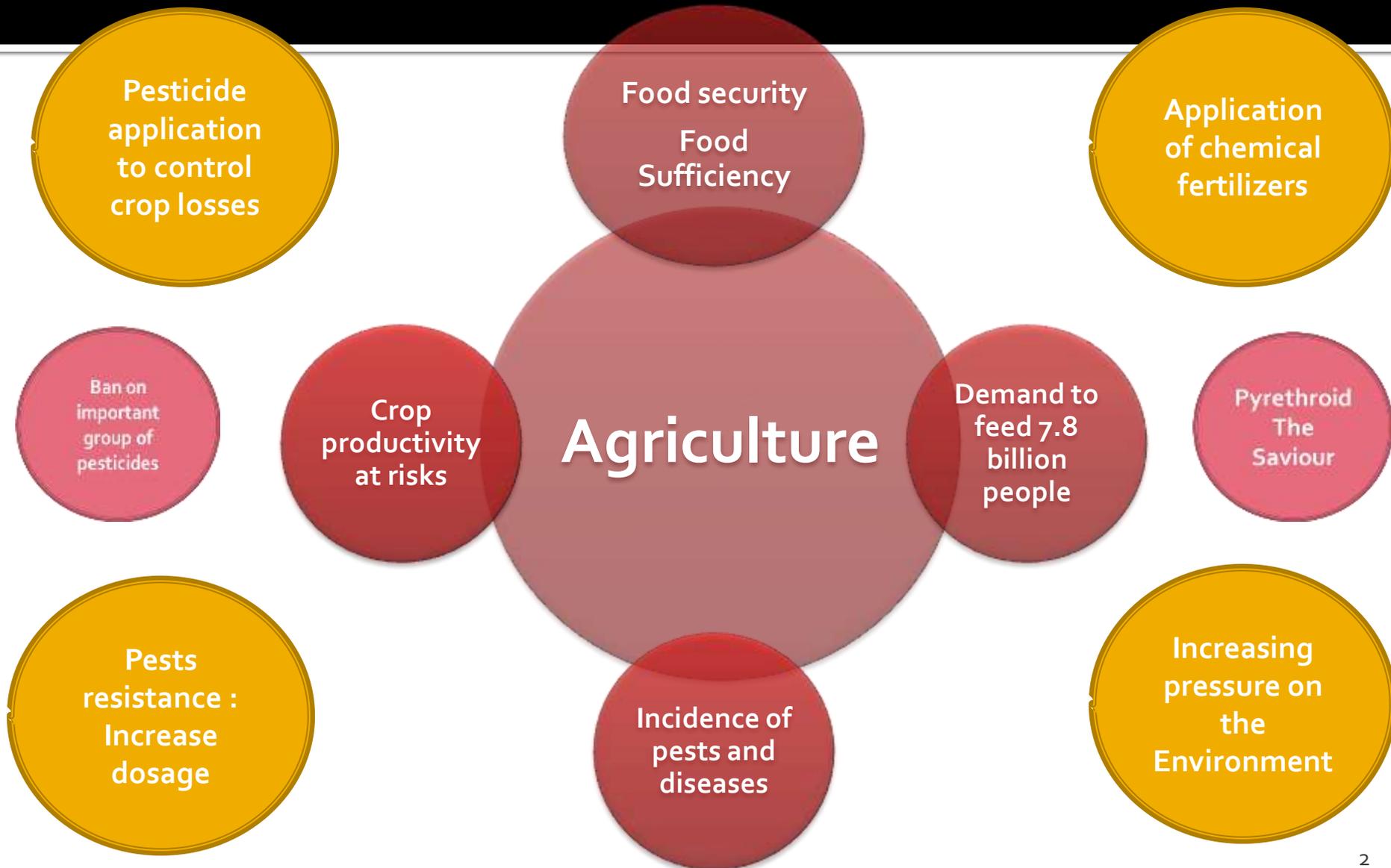
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# Introduction



# Objectives

- 1) To conduct a survey on cultivation practices among farmers in Mauritius who are growing mainly food crops.
- 2) To analyze different cultivation practices following the survey in terms of pesticides, fertilizers, manure and municipal solid waste compost uses and applications for the growth of *Daucus carota*.
- 3) To assess the soil quality under different cultivation practices in terms of nutrient content and heavy metals in the two selected agro-climatic regions.
- 4) To assess the environmental impacts of the different cultivation practices in terms of midpoint and endpoint categories.

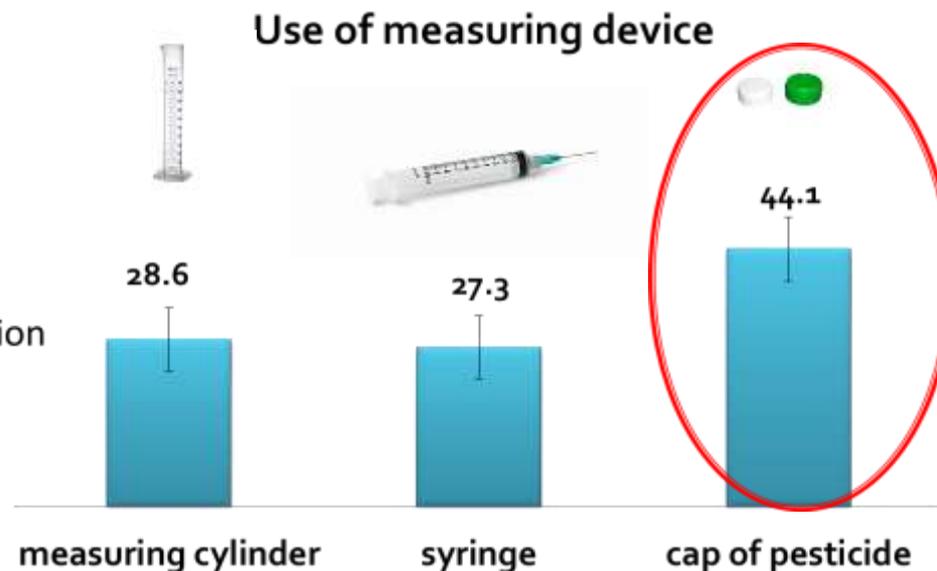


# Farmer's Survey



- 300 farmers interviewed
- 60 farmers from each region

- Pyrethroids most widely used: 95%
- Many malpractices detected
- 44 % farmers exceeded the dosage of pesticides unknowingly
- Factor analysis: influence from fellow farmers



Use of measuring device – 297 farmers  
Use of PPE – 105 farmers

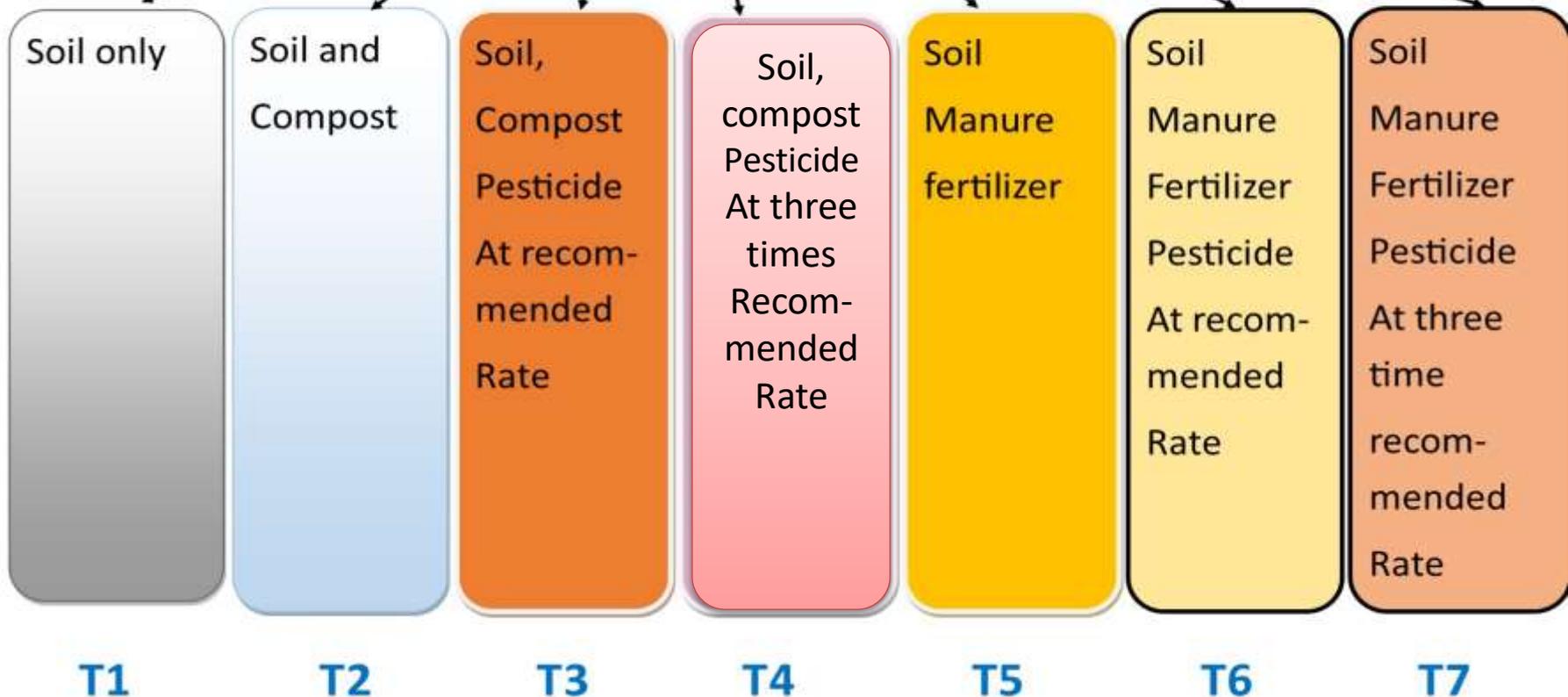


# Experimental Trial

Conducted in Sub Humid and Super Humid Regions  
Carrots grown under 7 treatments randomly replicated 4 times

Cypermethrin: 0.5 & 1.5 mL/L  
Deltamethrin: 0.5 & 1.5 mL/L

## Treatments



# Results and Discussions

**Highest yield** – T6 Conventional treatment

**Heavy metals** – Cd exceeded the limits at Super humid Region

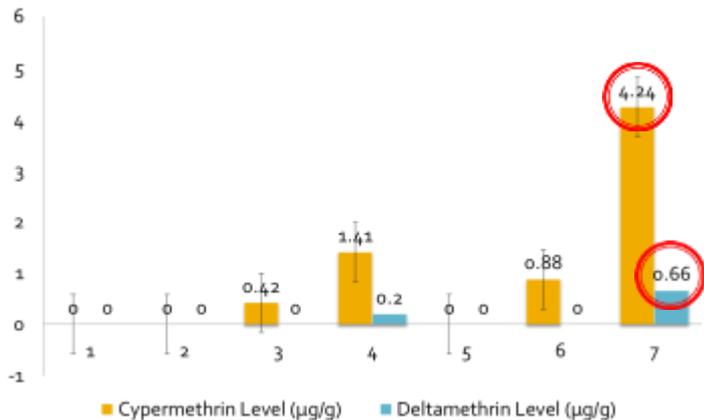
**Presence of pesticide in carrots**

- Where three fold pesticides were applied: Residue limits exceeded the MRL
- 2 times higher for cypermethrin
- 3 times higher for deltamethrin

Maximum Residue Levels (MRL)

Cypermethrin = 2µg/g

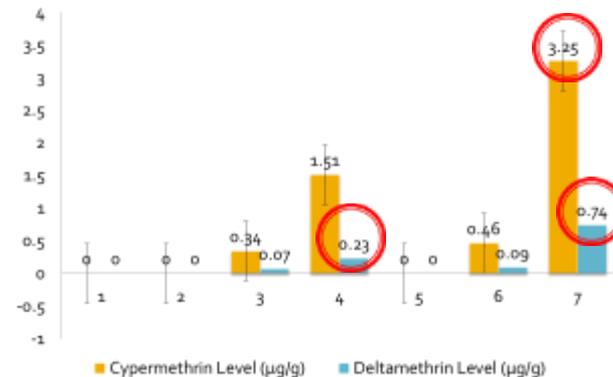
Deltamethrin = 0.2µg/g



Nutrients: N,P,K,  
Ca, Mg,  
Basic Parameters: pH, CEC, OM,  
Heavy metals: Pd, Zn and Cd

Yield in kg

Pesticide residue: Cypermethrin  
Deltamethrin



# Life Cycle Assessment

- A life cycle assessment was carried out to assess the environmental impacts of producing 1 ton of *Daucus carota* under two different scenarios (functional unit):

Scenarios	Description
Scenario 1	Conventional practice (Baseline): Chemical fertilizer and Manure – T6
Scenario 2	Recommended treatment: Municipal solid waste compost – T3

- On the whole, it was found that both scenarios have a negative impact on human health and the environment.
- However, in both cases the most hazardous substance to use was pesticides.



# Conclusions, Recommendations and future work

- Pesticide was detected in carrots where the dosage was exceeded
- Crops with excessive Pesticides cannot be consumed
- Hence excessive pesticide application has a negative impact on Food Security
- Investigation and continuous monitoring of pesticide residue on edible crops
- Tighter regulations in food crops
- More sensitization campaigns regarding dangers of pesticide usage
- Use of AI to detect pesticide at early stage
- Future of Agriculture lies in Organic Farming



# References

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