



Urban Agriculture Centre of Innovation

Centre for Research & Opportunities in Plant Science (CROPS)

Dr Kadamb Patel
Temasek Polytechnic
School of Applied Science
Singapore

Urban Agriculture Centre of Innovation

Centre for Research & Opportunities in Plant Science

Seed Innovation

- Seed Priming Technologies for Healthy Seedlings (Reduced hypocotyl)
- Better Seed Germination Rate
- Disease Management

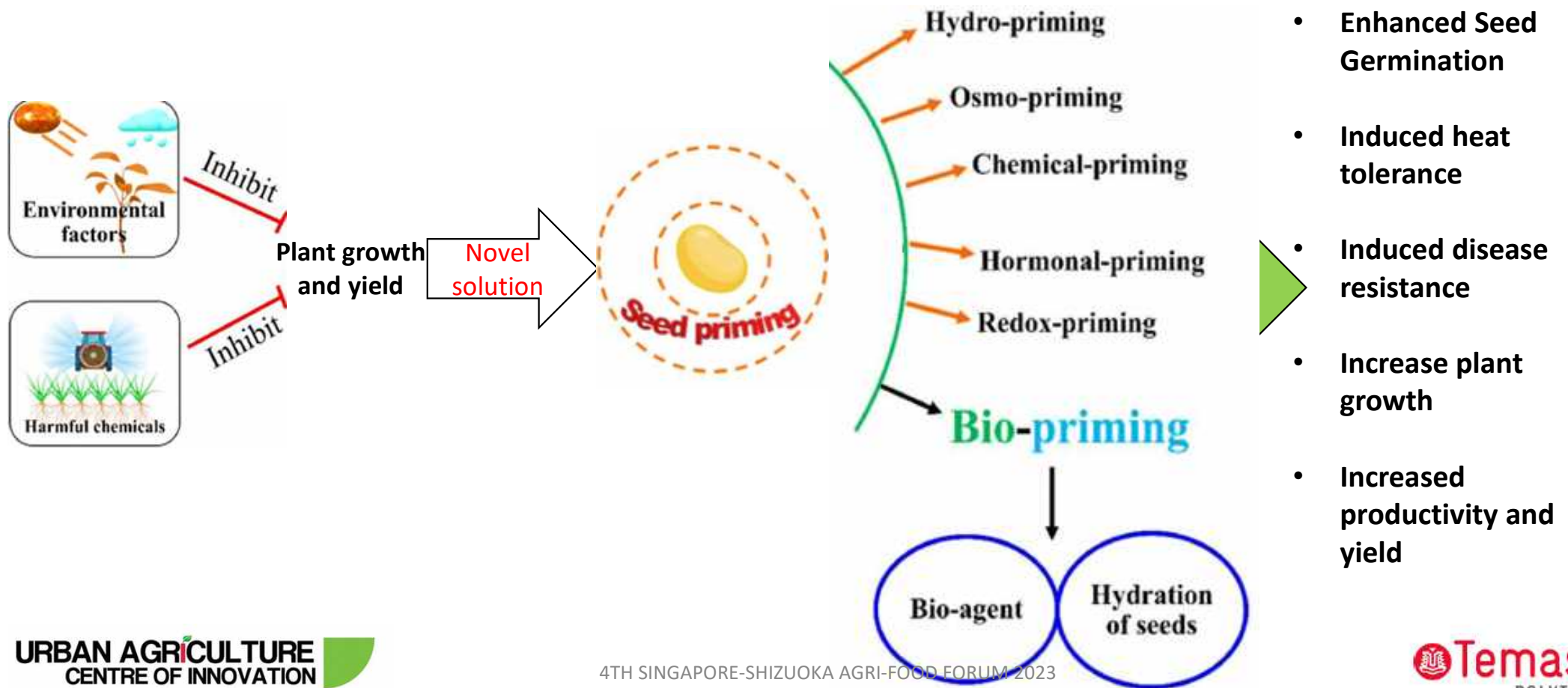
Soil Microbiome Modulation

- Species-specific microbiome
- Disease and Health Management of Plants
- High-Value Metabolites Enhancement

Post Harvest Technologies

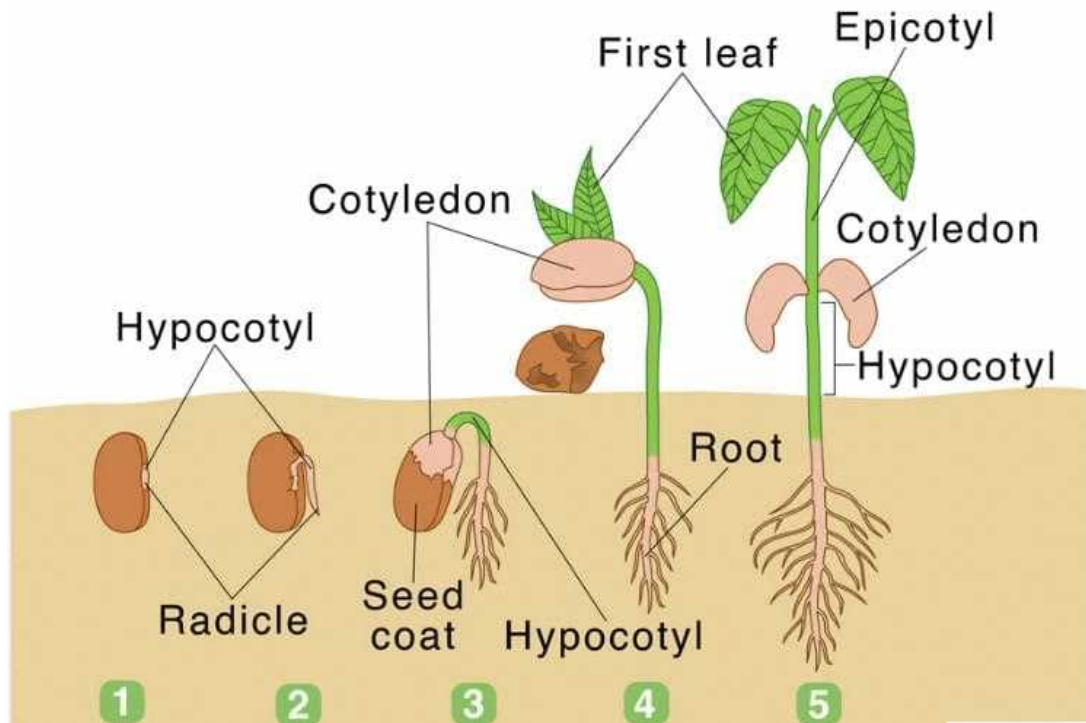
- Shelf life extension of green leafy
- Biowaste management
- Upscaling of Biowaste

Seed Priming Technology



Seed Priming Technology

Seed Germination



<https://www.utthancareerinstitute.com/seed-germination/>

- Enhanced Seed Germination
- Reduction of hypocotyl elongation

Seed Priming Technology



Control: Xiao Bai Chai 10- days seedling
with **slanted hypocotyl**



Treated Xiao Bai Chai 10-day Healthy
Seedling **Reduced hypocotyl**

Seed Priming Technology



Control: Chinese Cabbage 10- days seedling with **slanted hypocotyl**



Treated Chinese Cabbage 10 - days healthy seedling with **reduced hypocotyl**

Seed Priming Technology

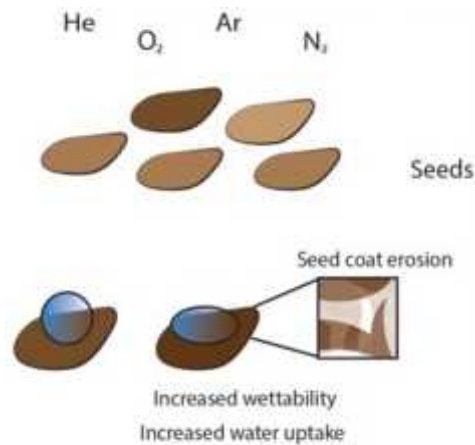


**Control: Choy Sim 14- days old seedling
with **slanted hypocotyl****

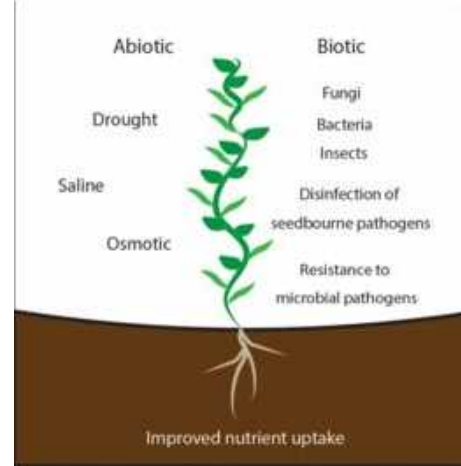


**Treated Choy Sim 14- days old healthy
seedling **reduced hypocotyl****

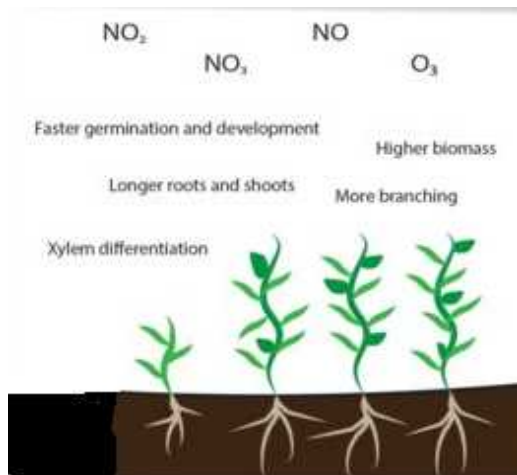
Seed Priming Technology



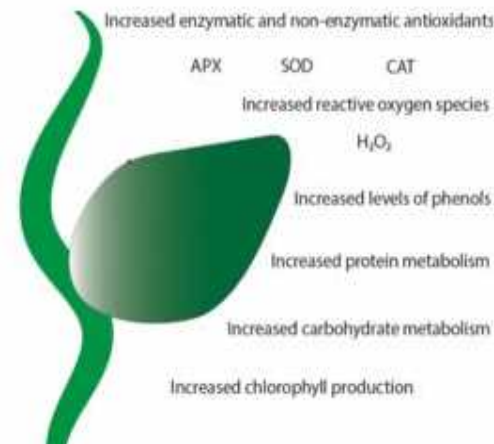
Seed priming recipes with natural extracts / microbes for healthy germination



Seed treatment recipes to induce heat tolerance using LED light and microbes



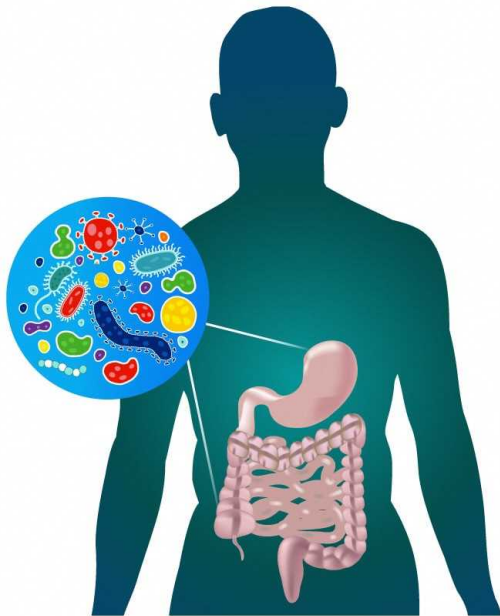
Seed priming recipes with microbes for faster germination, healthy roots and increased biomass



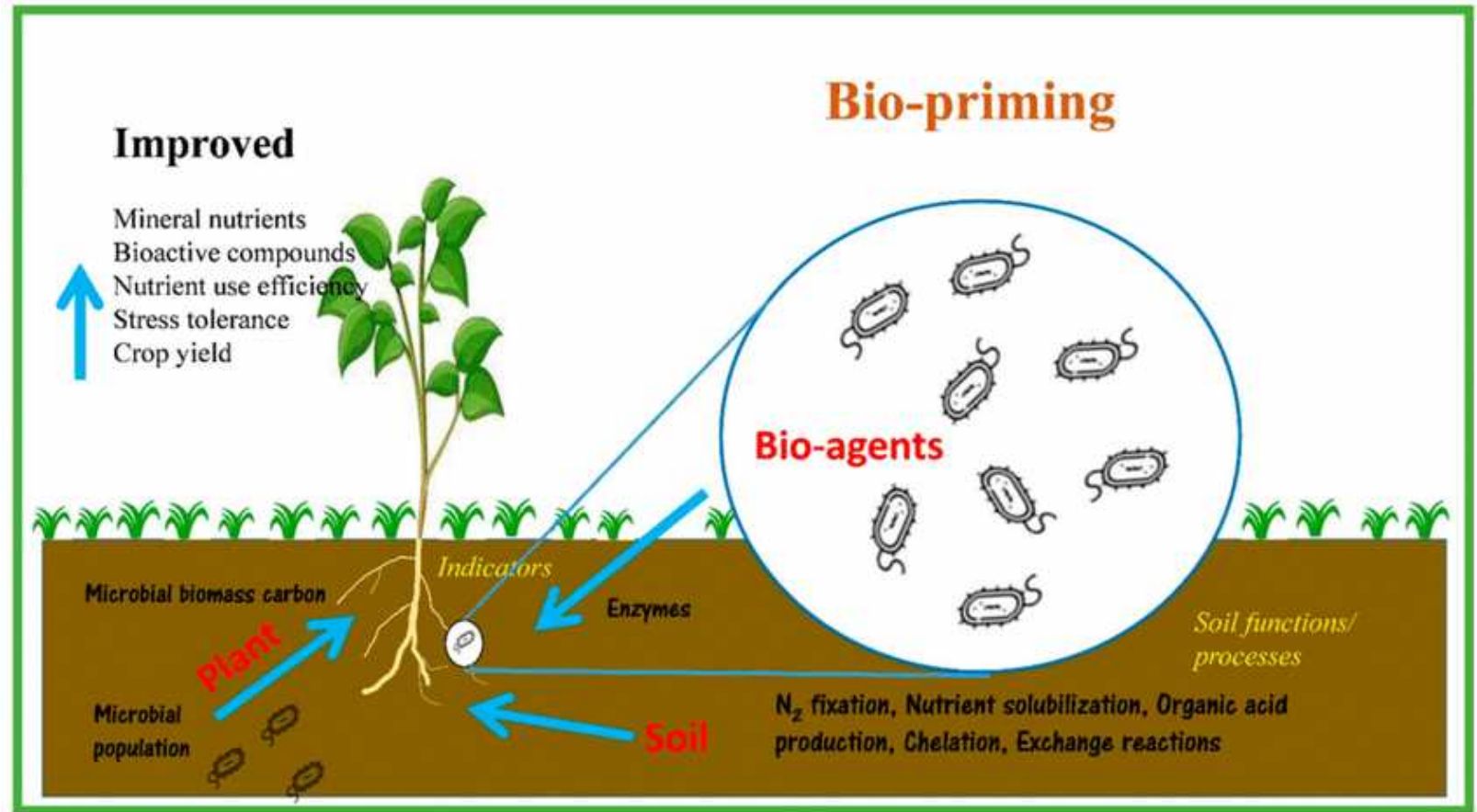
Seed germination recipes to increase metabolism

Species-specific Microbiome

The Gut Microbiome is Unique

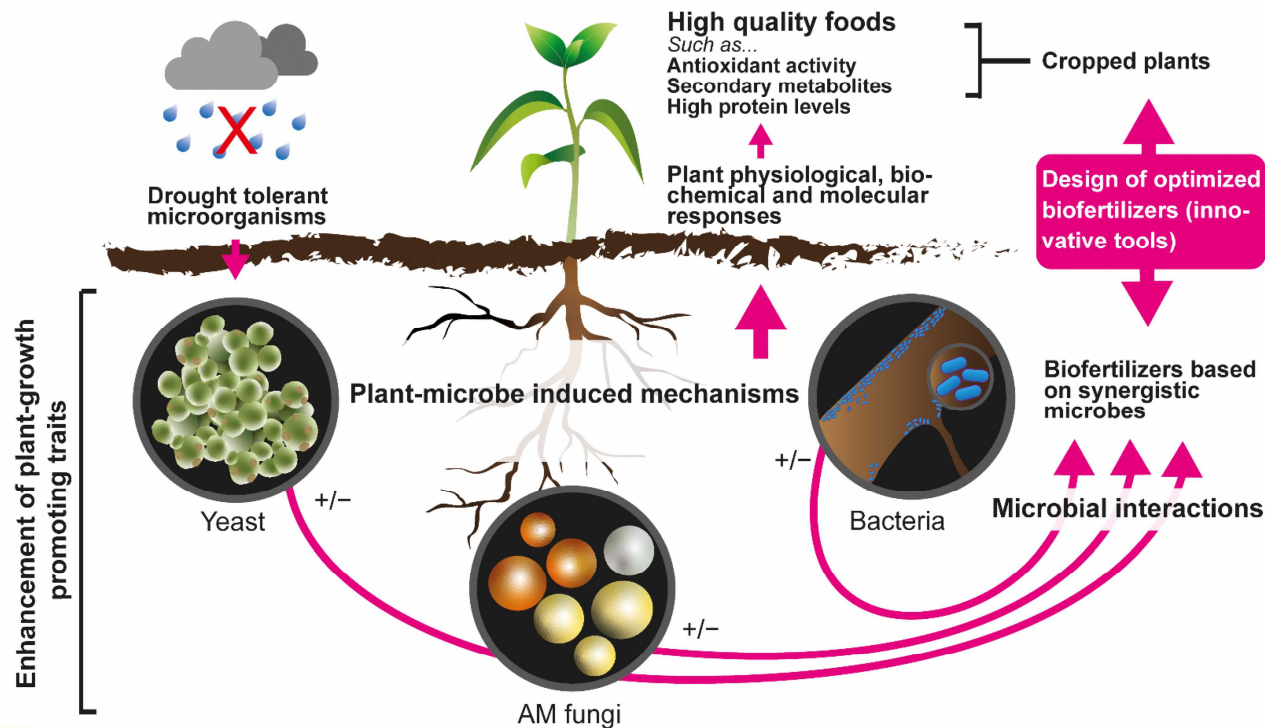


So is Soil Microbiome



Soil Microbiome Modulation for High-Value Metabolites Enhancement and Disease management

- Metabolites Enhancement: Micronutrients (Hormones, Vitamins and Minerals)
- Modulation of soil microbiome for management of plant disease:
Systemic acquired resistance (SAR) and Induced systemic resistance (ISR)



Extension of shelf life

Hydrogel and edible coating formulations technologies for enhancing the post-harvest shelf life of agricultural produce.

Edible coating:

- Polysaccharides, Lipid and proteins and their combinations.
- Enriched with antibacterial plants extracts



Desirable impacts:

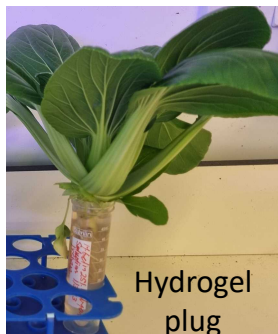
- Reduce gas exchange
- Reduce moisture loss
- Reduce microbial infection
- Preserve nutrients



Desirable outcomes:

- Improved shelf life
- Reduced microbial spoilage

Hydrogel plug formulation



Extension of shelf life of green leafy by five days

Reduction in biowaste

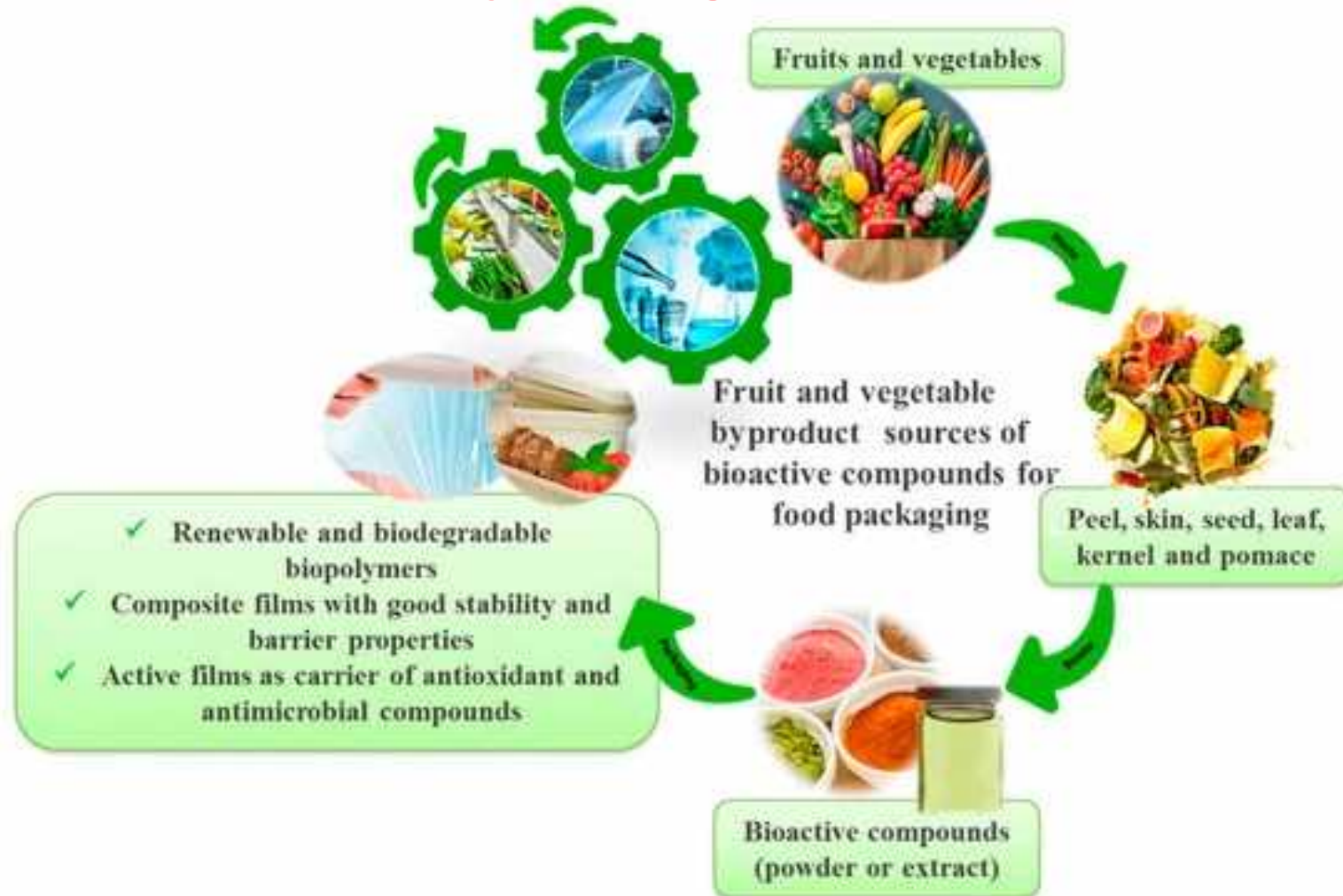
Better returns for growers



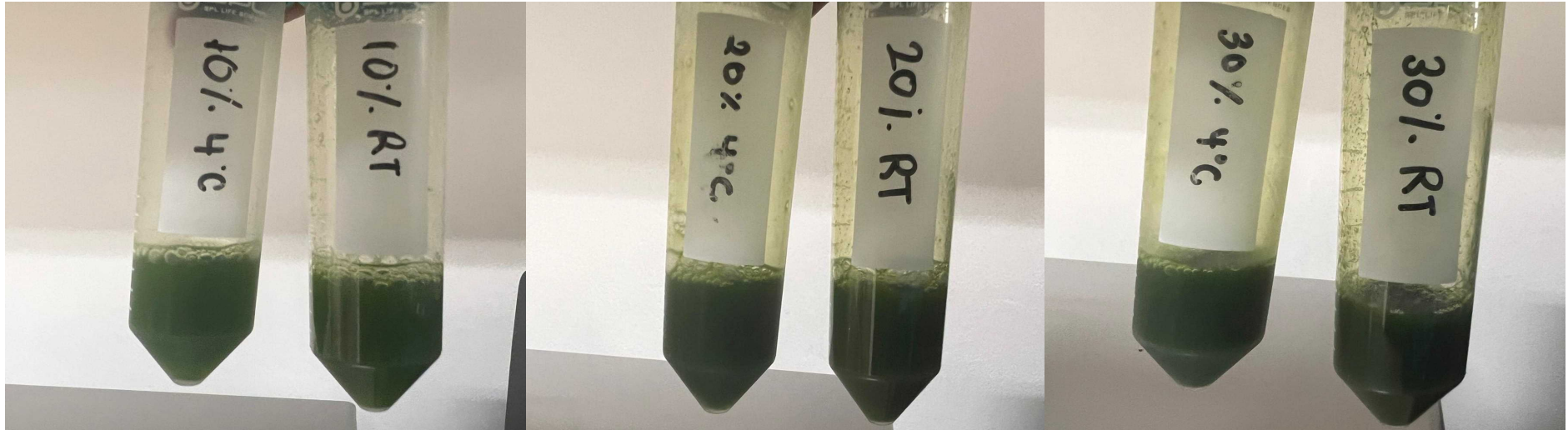
Biowaste Management



Upscaling of Biowaste



Upscaling of Biowaste



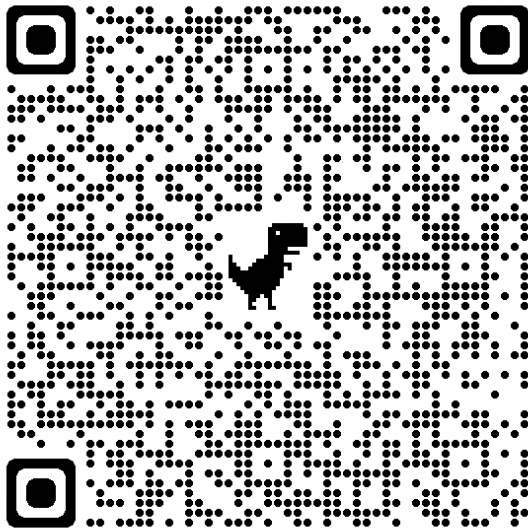
Extraction and stabilization of pigments from wasted vegetable trimmings (Green/Red Tatsoi)

Food color
High-value antioxidant
Cosmeceuticals ingredient
Health supplement

UA COI CROPS Team



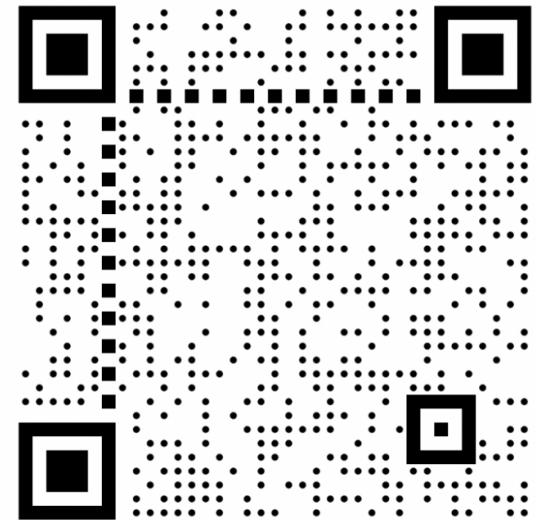
Thank you



CROPS

Contact us:

Centre for Research &
Opportunities in Plant Science
(CROPS)



**Dr Kadamb Patel,
HEAD, CROPS**