



The Role of Bio-pesticides and Biofertilisers in Ensuring Food Security

-Kartik Laijawala
Nico Orgo Manures



www.neemnico.com

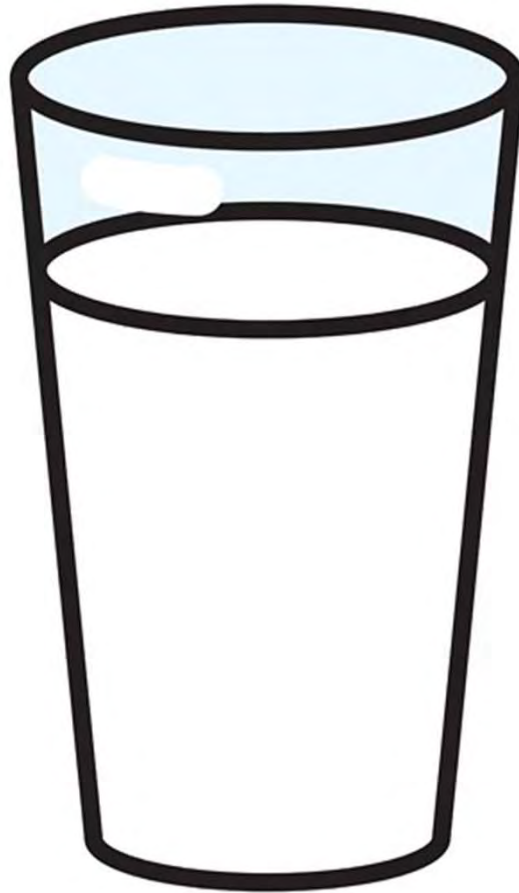


**How will we feed 8 billion people by
2020?**

Biofertiliser

- A substance containing microorganisms that promotes growth by increasing the availability of nutrients in the rhizosphere.

Imagine a glass of milk...



Similarly:

- Decades of use of chemical NPK has left behind large quantities in our soils that are not in a useable form.
- Biofertilisers will free up all that stored nutrition.

Developing nations:

1. Small Farmers

- Hand-to-mouth existence
- Unlikely to try anything new because the cost is prohibitive.
- Biofertilisers are cheap and readily available, even to the smallest farmer.

2. Disjointed fields

- Hard to apply conventional fertilizers appropriately.
- Biofertilisers can easily be applied, on the smallest plots of land.

3. Indiscriminate use of Urea, DAP and other inputs.

- Fertilizer is applied blindly without regard for timely application.
- The problem of shortages.
- 50% of the requirement can be replaced with biofertiliser, preventing excesses of Urea, DAP.
- The plant has access to the nutrition as and when required.

It's all about the yield.

- Easy availability +
- Easy Application +
- Increased Fertiliser Use Efficiency

= Increased yields

= More money in the bank!



Bio-pesticides

The term **bio-pesticide** is used for microbial biological pest control agents that are applied in a manner similar to chemical pesticides

Advantages

- Inherently less toxic than conventional pesticides.
- Affect only the target pest.
- Effective in very small quantities
- Often decompose quickly
- Can be used in IPM programs.

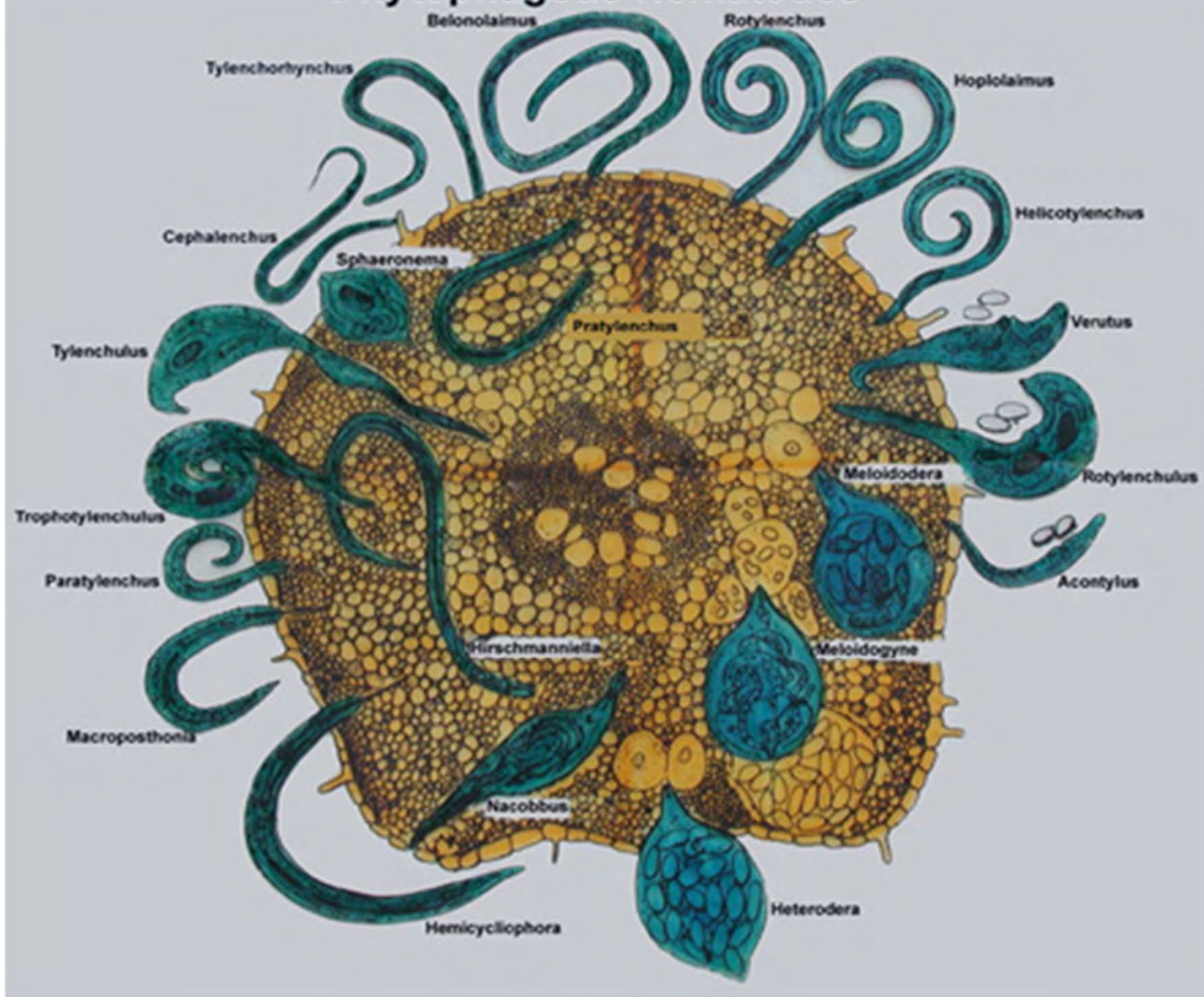
Nematodes, an introduction

- Nematode infestation is one of the major stresses affecting crop production worldwide.
- Chemical control has led to the development of resistance.
- Synthetic nematicides indiscriminately destroy beneficial soil fauna.

Nematodes, an introduction

- Nematodes cause an estimated \$157 billion of crop losses annually.
- Nematodes leave the plant susceptible to disease causing *additional yield losses*.

Phytophagous Nematodes



તમાકુ ના પાક માં ગંઠવા કૃમીથી થતું બુકસાન





Root-knot nematodes on Bitter-gourd







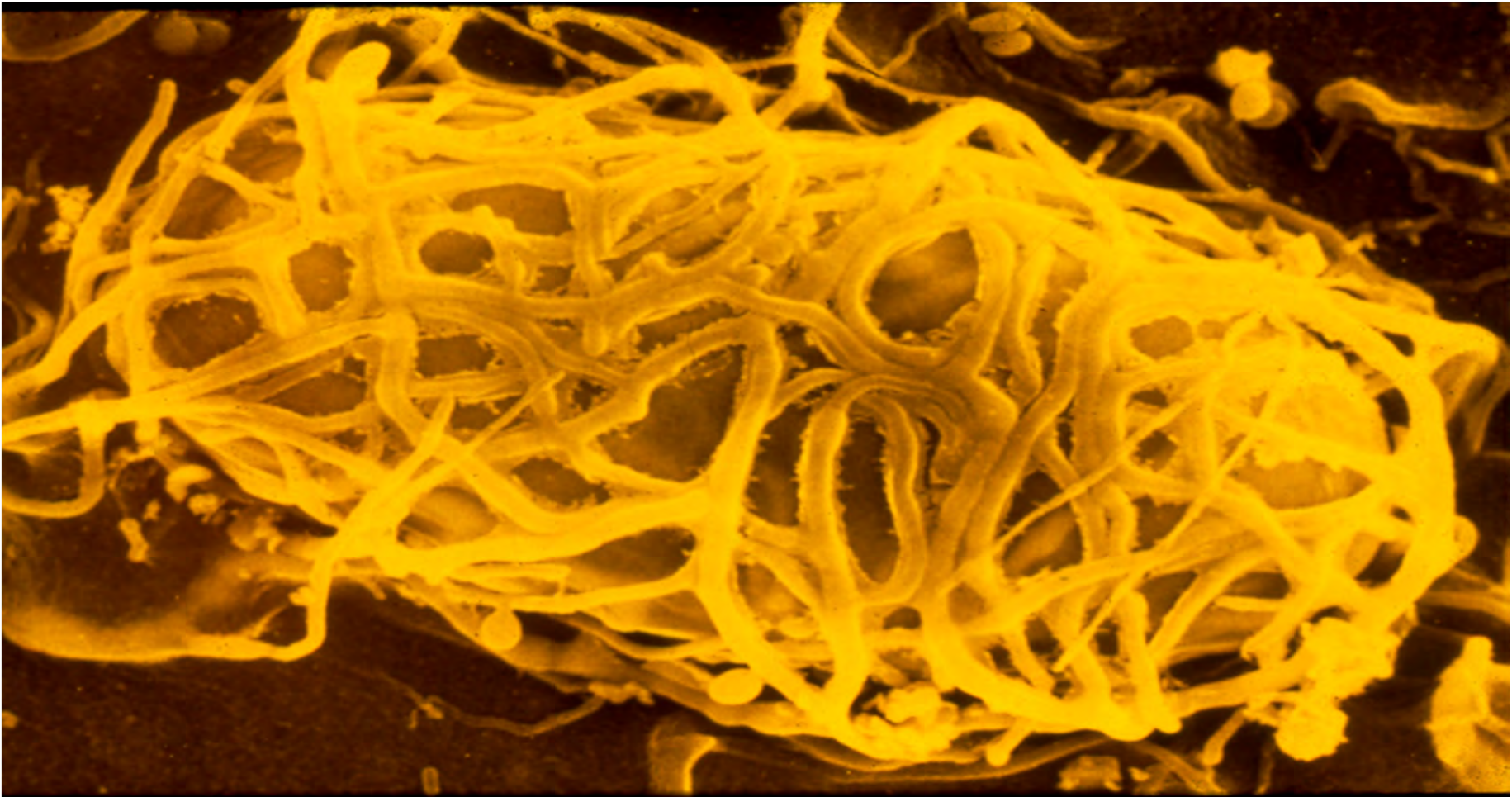
The bio-solution for Nematode infestation

- A common, filamentous fungus known as *Paecilomyces lilacinus*.

Mode of action

- *P. lilacinus* colonizes the nematode eggs and destroys up to 90% of eggs and 75%-80% of egg masses or cysts.

Colonised Nematode egg



Benefits

- Acts in decomposing raw organic substances and solubilizing phosphorus.
- Eliminates the use of costly and harmful chemicals.
- Zero residual toxicity.
- Promotes plant growth.
- Does not lead to development of resistance in plant pathogens.

Benefits

- Can be used at all stages of plant growth.
- Biodegradable & target specific.
- Eco-friendly.
- Non toxic to humans, animals, plants and predators of insects.
- Amends the soil.

Potato Research Station, Deesa, India

Treatment	Potato yield (MT per hectare)	Percent increase
Control	16.54	-
5 kg <i>P. lilacinus</i> as basal dose	22.53	36.2% increase over control

Conclusion

- Biofertilisers and bio-pesticides can increase yields incrementally, without burdening the farmers pocket.
- That very point makes them the most likely to help us solve the food security problem.



Thank you!



www.neemnico.com