



Bio-pesticides

Paecilomyces Lilacinus

Bio-pesticides

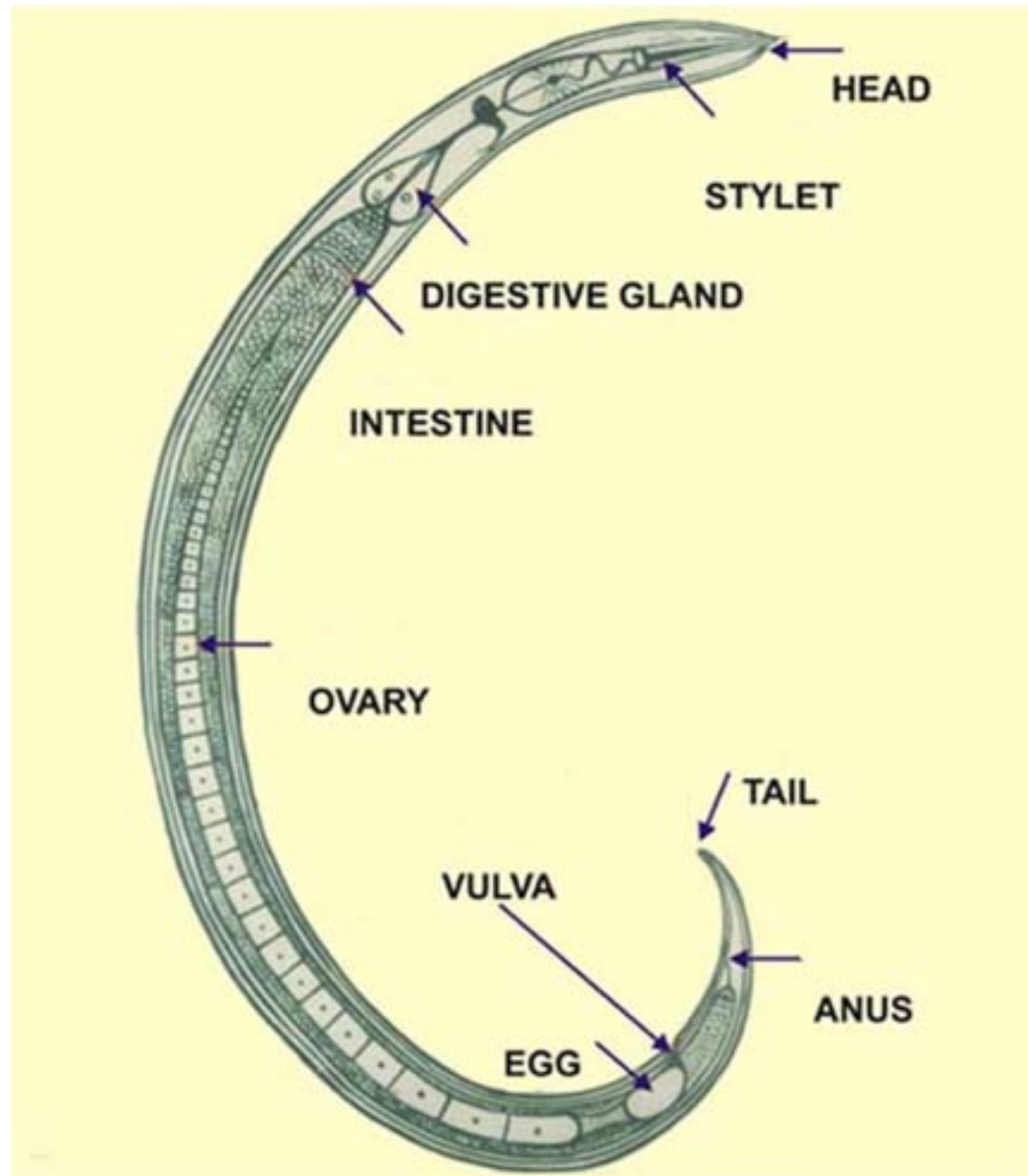
The term **bio-pesticide** is used for microbial biological pest control agents that are applied in a manner similar to chemical pesticides

Advantages

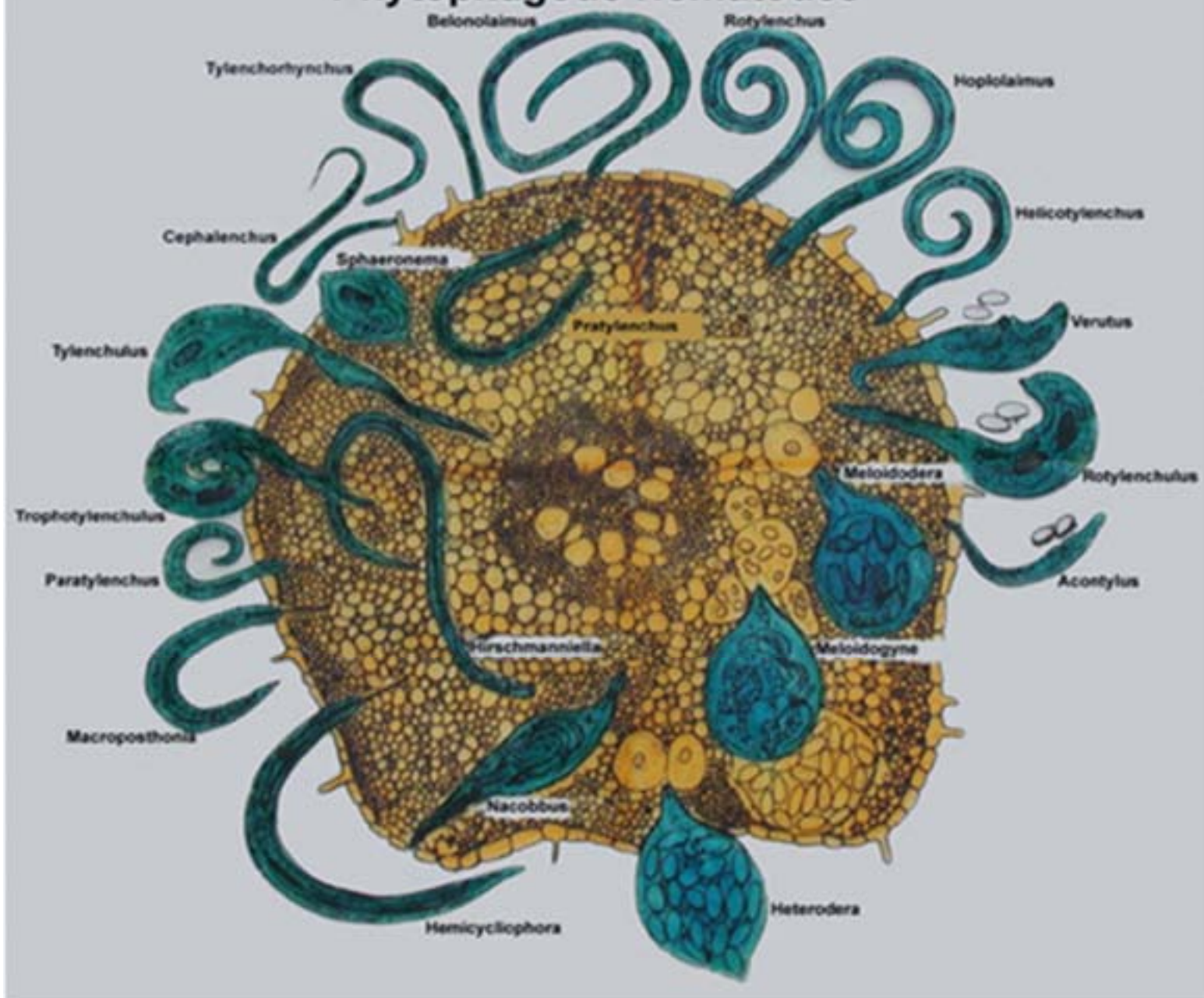
- Inherently less toxic than conventional pesticides.
- Affect only the target pest.
- Effective in very small quantities
- Often decompose quickly
- Can be used in IPM programs.

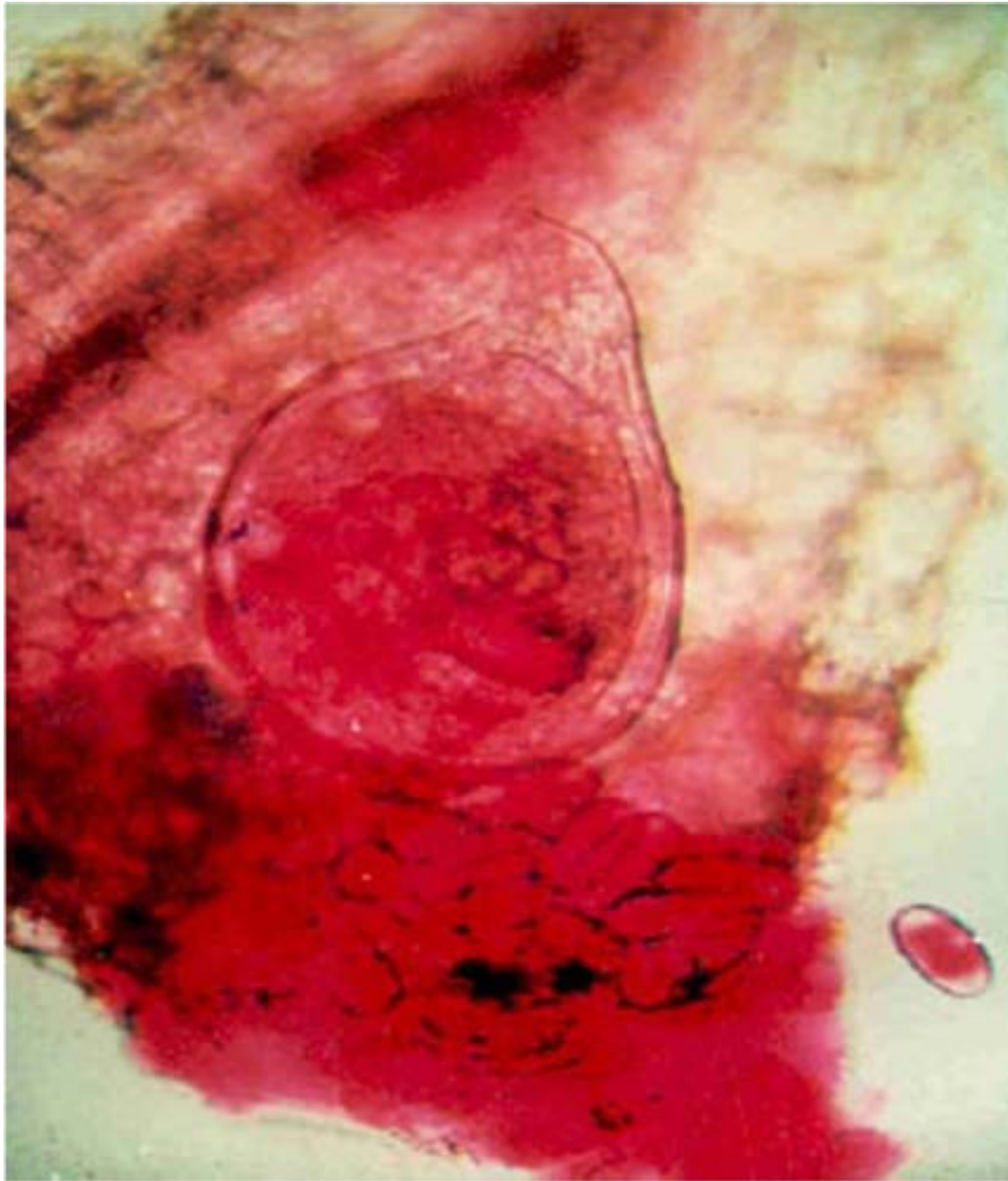
Nematodes, an introduction

- Nematode infestation is one of the major stresses affecting crop production worldwide.
- Nematodes leave the plant susceptible to disease causing *additional yield losses*.
- Chemical control has led to the development of resistance.
- Synthetic nematicides indiscriminately destroy beneficial soil fauna.



Phytophagous Nematodes





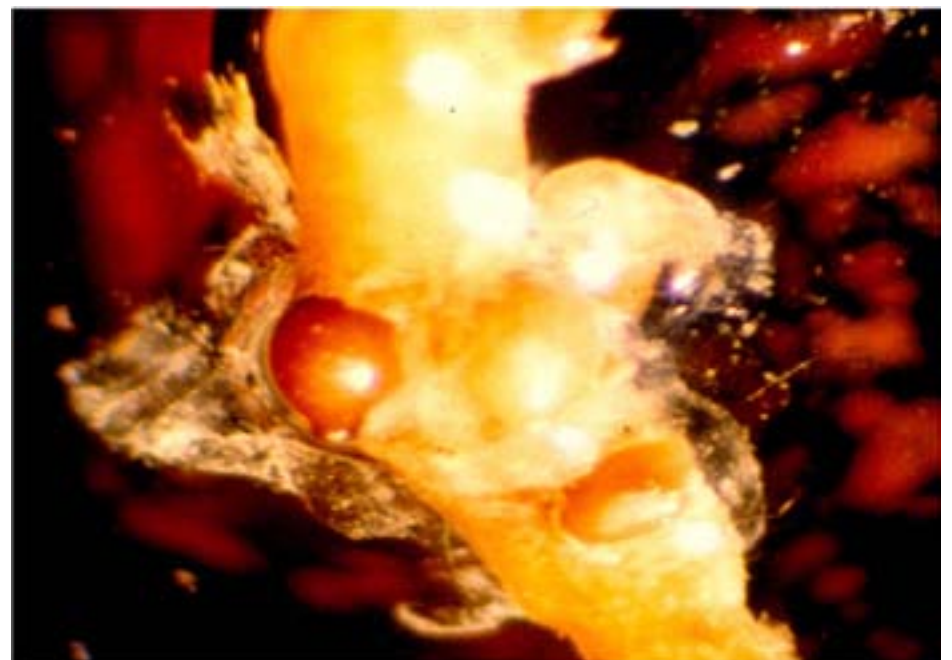


Root-knot nematodes on Bitter-gourd





Cyst Nematodes on Pigeon pea





What is the solution?

Chemical Solutions?

Methyl Bromide:

- Is a recognized ozone-depleting chemical.
- Its use is severely restricted under the Montreal Protocol

Carbofuran:

- Neurotoxic, kills non target organisms.

Chemical Solutions?

- Newer chemical nematicides are still under the testing phase.
- Chemical nematicides cause pollution during production as well as field use, a serious problem.

The real solution:

- A common saprobic, filamentous fungus.



Paecilomyces Lilacinus

- *Paecilomyces* is a cosmopolitan filamentous fungus which inhabits the soil, decaying plants, and food products.
- The colour is initially white, and becomes yellow, yellow-green, yellow-brown, olive-brown, pink, or violet, depending on the species.

Paecilomyces Lilacinus

P.lilacinus is a commonly soil saprophyte and a facultative parasitic fungus attacking sedentary stages of nematodes.

Protects the root system against diseases caused by plant parasitic nematodes.





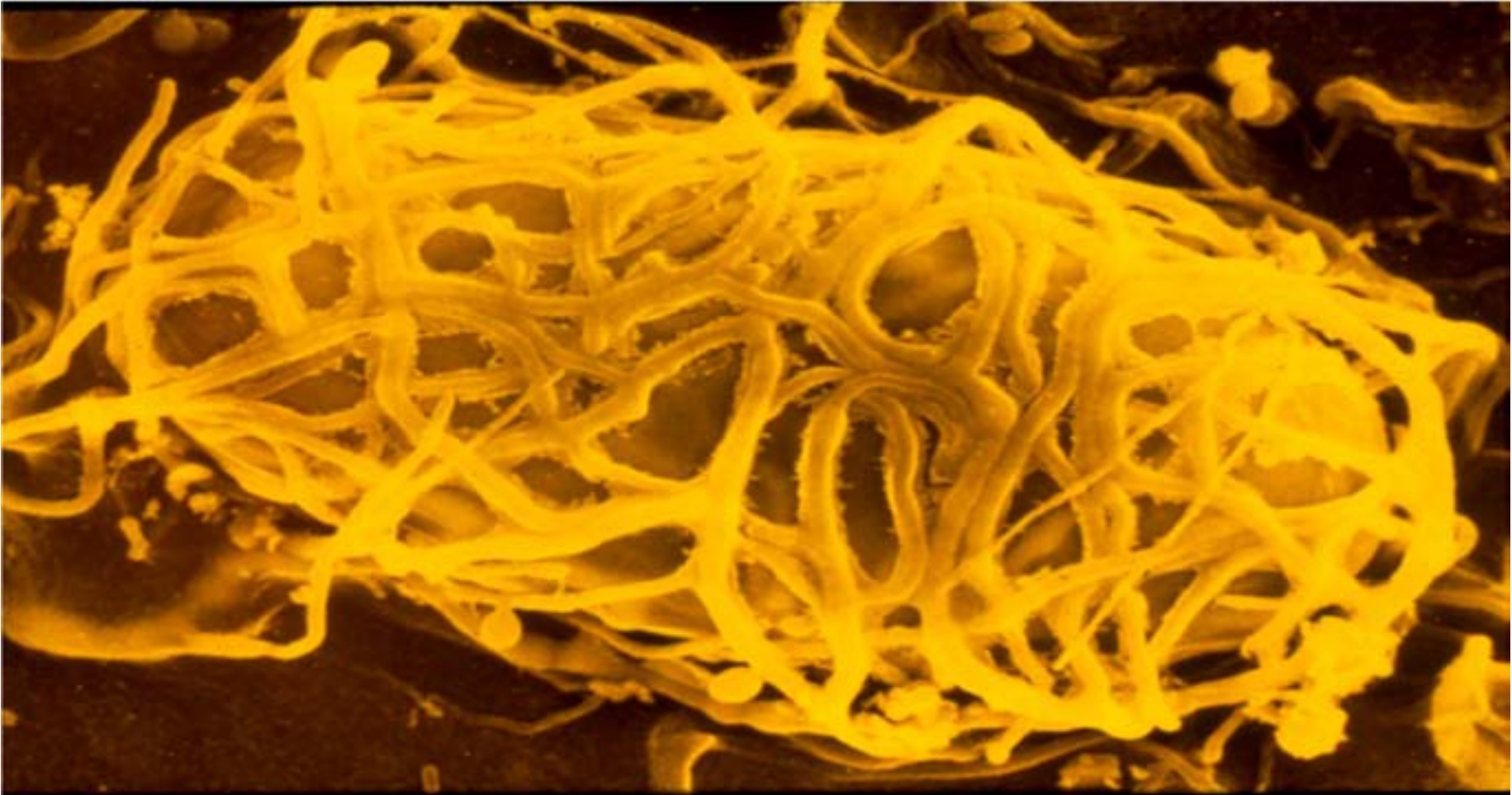
Taxonomic classification

Kingdom: Fungi
Phylum : Ascomycota
Class : Euascomycetes
Order : Eurotiales
Family : Trichocomaceae
Genus : *Paecilomyces*

Mode of action

- Destroys up to 90% of eggs and 75%-80% of egg-masses or cysts.

Colonised Nematode egg



Composition of the nematode eggshell

- Inner lipid layer
- Middle chitinous layer
- Outer vitelline layer.

Effective against nematodes such as:

- Root-knot nematodes : *Meloidogyne spp.*
- Golden cyst nematode : *Globodera pallida* & *G. rostochiensis*
- Cyst nematode : *Heterodera spp.*
- Citrus nematode : *Tylenchulus semipaenetrans*
- Burrowing nematode : *Radopholus similes*
- Reniform nematode : *Rontylenchulus reniformis*

Our Observations:

- Proteases are secreted by the fungus in order to penetrate the cuticle and cell wall of the target.
- This protease activity is induced after the fungus has been in contact with the nematodes .

Our Observations:

- *P.lilacinus* does not recognize the plant root surface as a potential host.
- *P.lilacinus* is not a plant pathogen

Benefits

- Acting in decomposing raw organic substances and solubilizing phosphorus.
- Eliminating 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.

Precautions

- Apply during evening in humid conditions. If conditions are dry irrigate the field before application.
- Chemical fertilizers/ insecticides should not be sprayed before or after 5-7 days for best results.
- Do not mix with chemical fertilizers or insecticides at the time of application.
- Store in cool place away from direct light and heat.

Crops

- It is useful for over 200 Field, Fruit, Vegetable, Plantation, Ornamental and Greenhouse crops.
- It can also be used for Landscape, Forest, Turf and other agriculture crops.



Thank you!



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