

Control of plant-parasitic nematodes using Aqua4D: from fantasy to reality

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Planet Horizons Technologies SA

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The Phylum 'Nematoda'

Animal-parasitic nematodes

Entomopathogenic nematodes

Marine nematodes

Plant-parasitic nematodes

Soil-borne nematodes



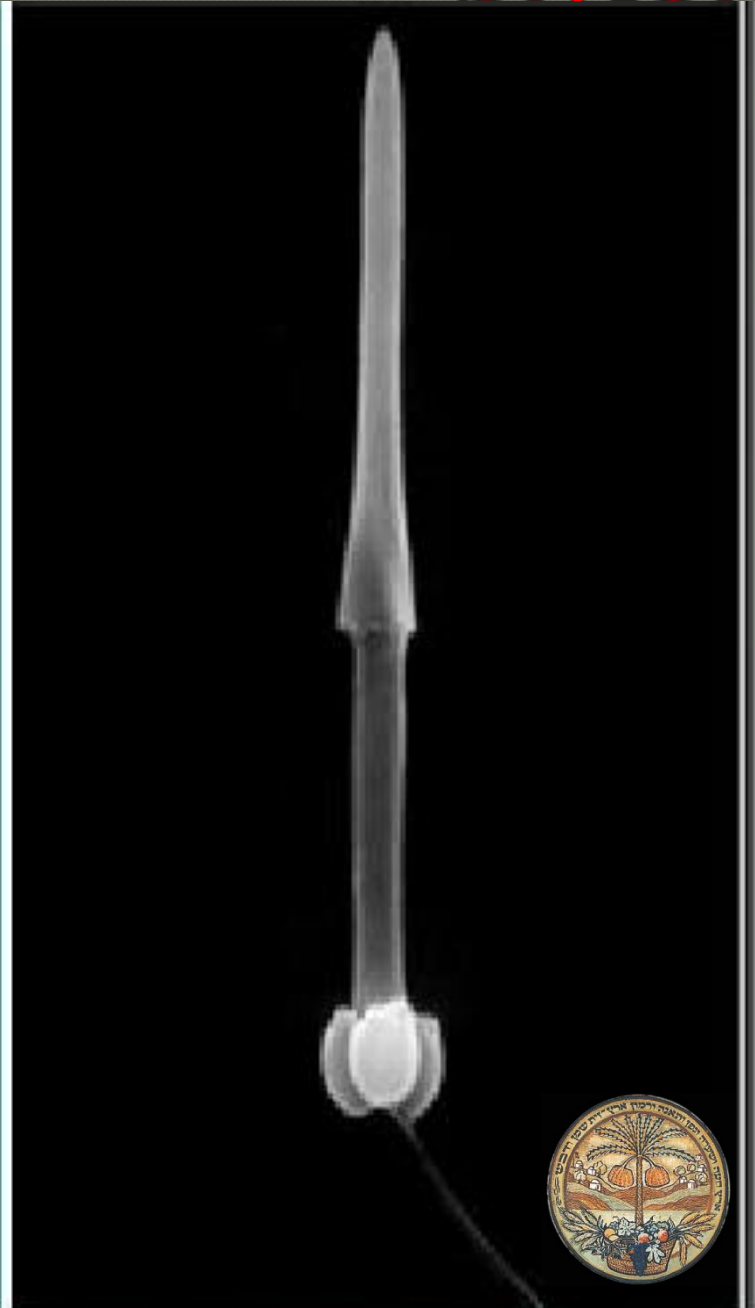
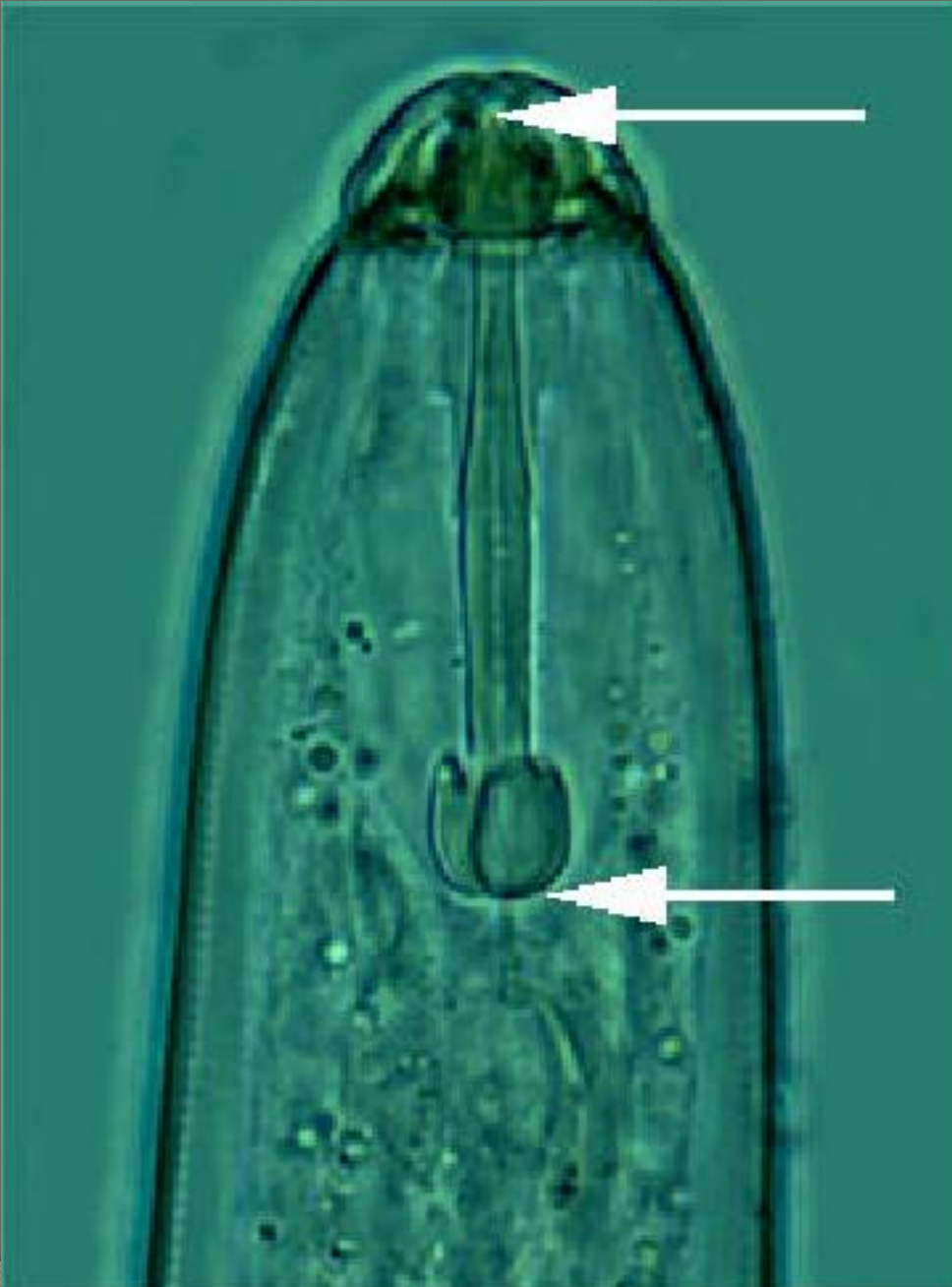
Characteristics of PPN

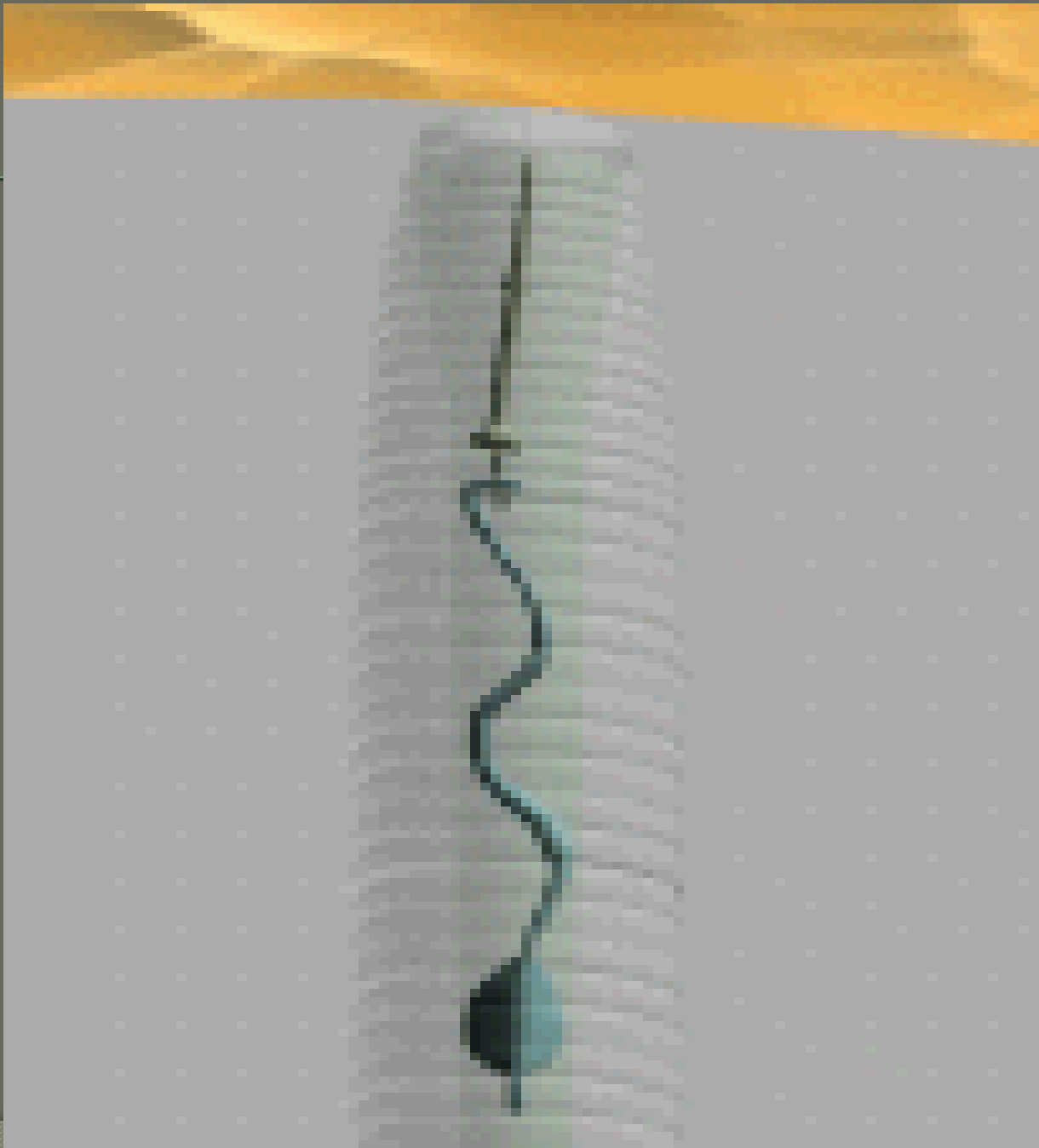
① **1. Obligate parasites**

② **2. Stylet**

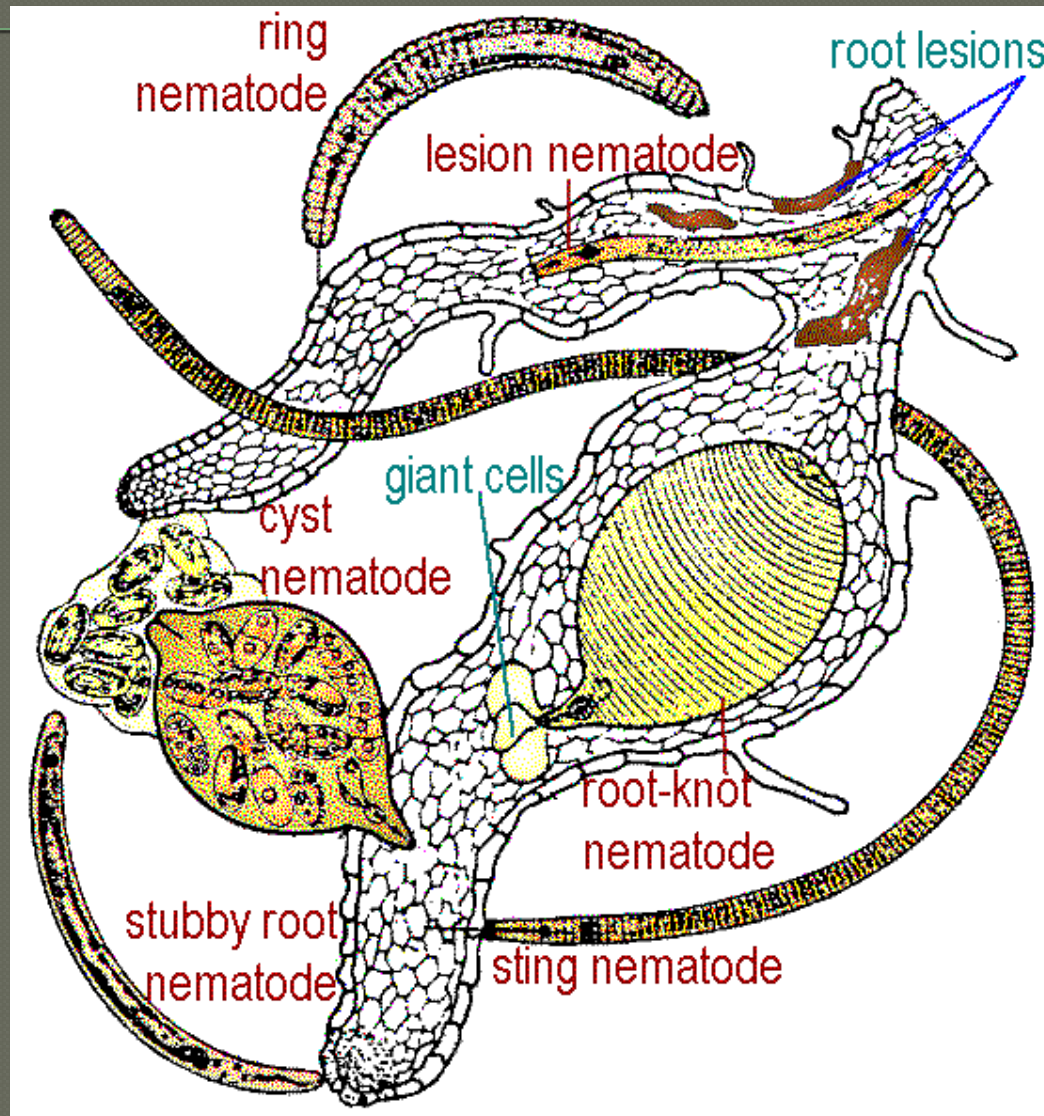


Styilet

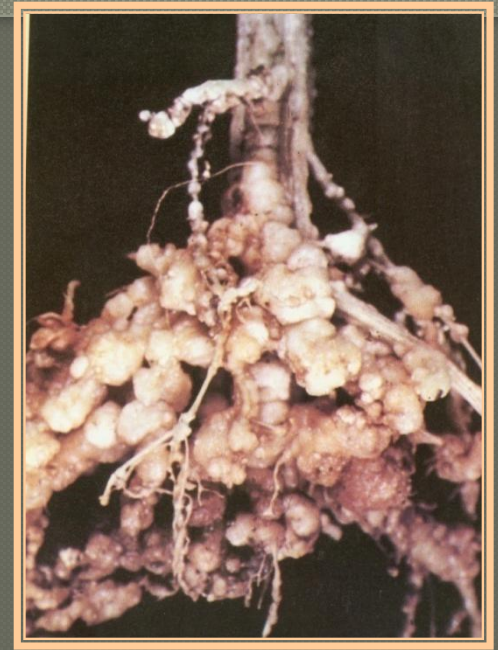




Various types of nutrition



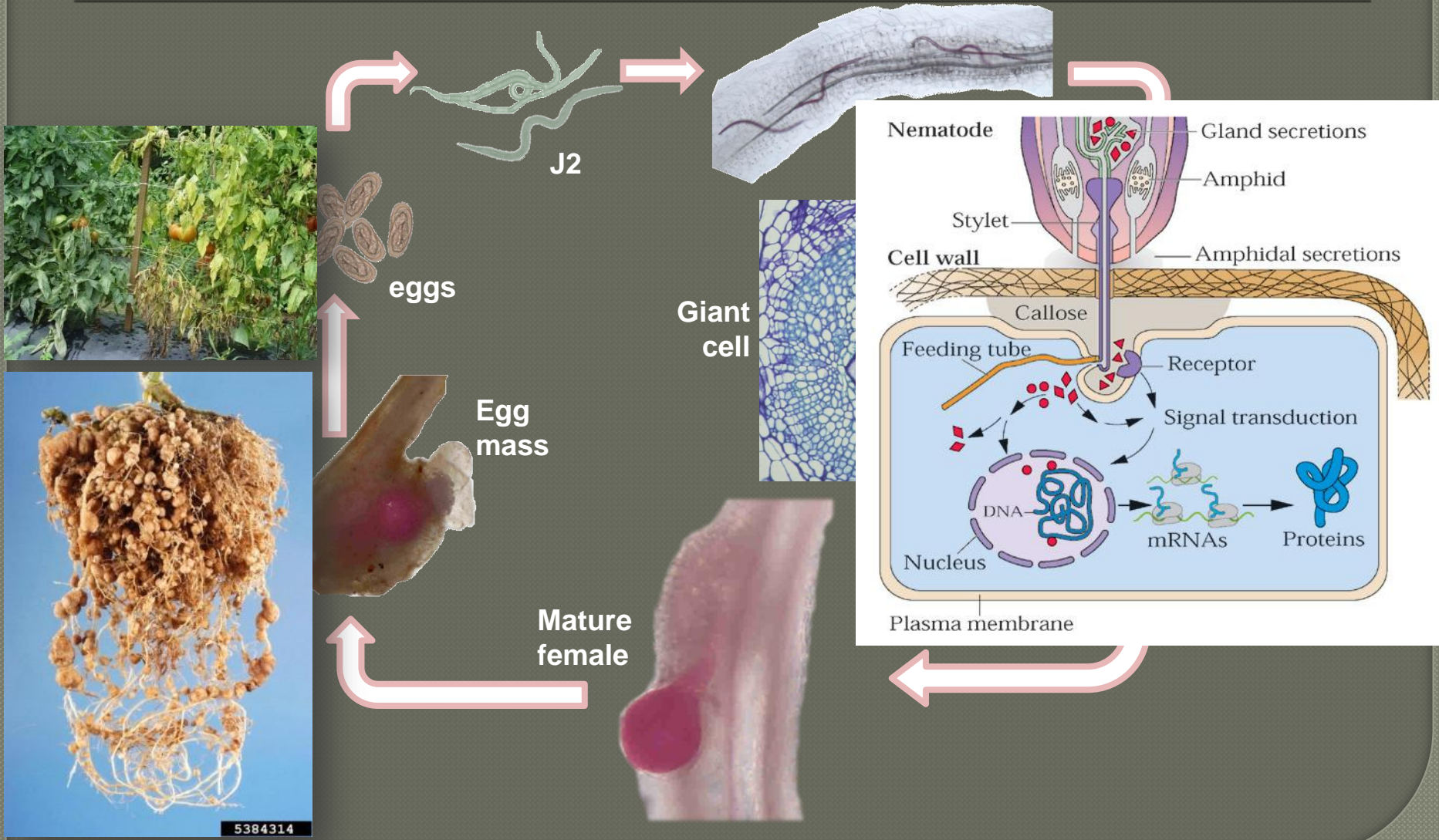
Root-knot nematodes (*Meloidogyne*) are one of the most damaging plant-parasitic species. These sedentary endo-parasites cause root galls and alter the root metabolism.



The infective juveniles and eggs are the 'preferable' candidates for microbial & chemical attacks in soil.



The Root-Knot Nematode, *Meloidogyne* spp.



**The damage caused
by plant-parasitic
nematodes' parasitism is
estimated by more than
100 billion dollars world-
wide**



**One billion \$ - the
market for
nematicides and
sterilants to be
replaced.**



'Conventional' Control Methods

- ◉ **Resistant varieties**
- ◉ **Chemical control**
- ◉ **Agrotechnical methods (e.g. fallow)**
- ◉ **Physical control (e.g. soil solarization, steam sterilization)**
- ◉ **Biological control**



Updated Forecast for Nematicides according to EU-Pesticides database

Available soil sterilization agents active against nematodes

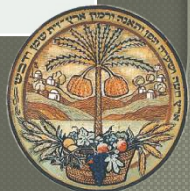
Licensed in Europe	Active compound	Organic farm	Before planting
Banned	1,3 DICHLOROPROPENE	-----	91% Condor 94% Telon
Banned	DIMETHYL DISULPHIDE	-----	Paladin
Approved	METHAM SODIUM	-----	Edigan
Banned	CHLOROPICRIN	-----	Chloropicrin

We have left with soil solarization, animal manure & steam

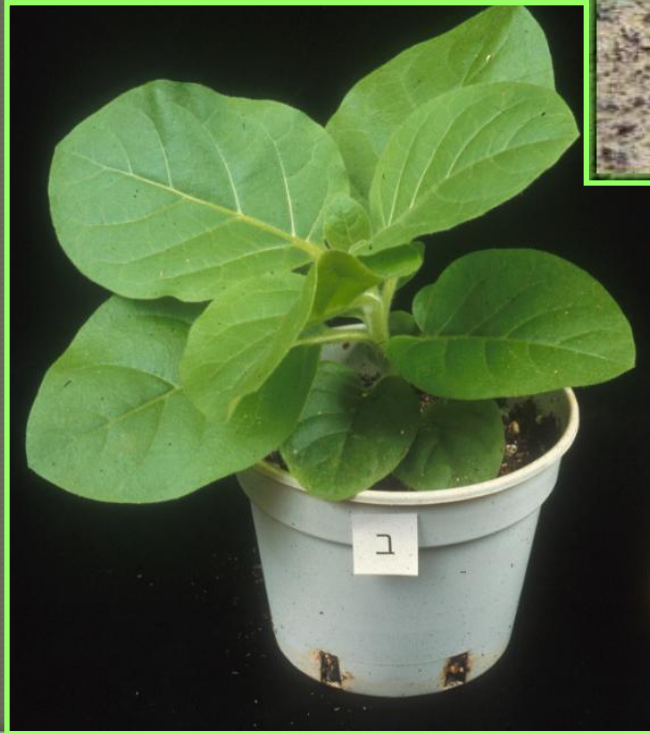
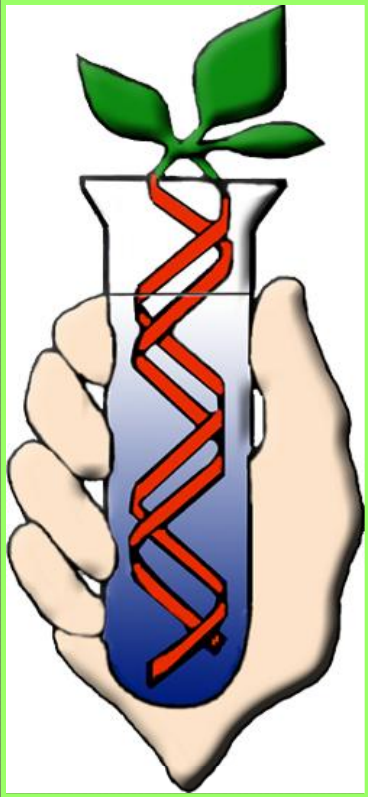


Nematicides applied during growth period

Licensed in EU	Active component	Organic farming	Commercial Name
Approved	PHENAMIPHOS	-----	Nemacur
Approved	OXAMYL	-----	Vydate
Banned	CADUSAFOS	-----	Super Rugbi
Not approved	ABAMECTIN	-----	Vertimec
Within a process	FLUENSULFONE	-----	MCW
Approved	<i>Bacillus firmus</i>	Biosafe	Bionem



From the Petri dish to the field





Control
(non-treated plants)





Control
(non-treated plants)





Control
(Treated-plants)





Control
(treated-plants)






control
(non-treated plants)

Control
Treated-plants





Control
(treated-plants)



Control
(non-treated plants)





Nematode-infected
(non-treated plants)





**Nematode-infected
(non-treated plants)**





Nematode-infected
(treated-plants)





Nematode-infected
(treated-plants)





**Nematode-infected
(treated-plants)**

**Control
(treated-plants)**





Nematode-infected
(non-treated plants)

Nematode-infected
(treated-plants)





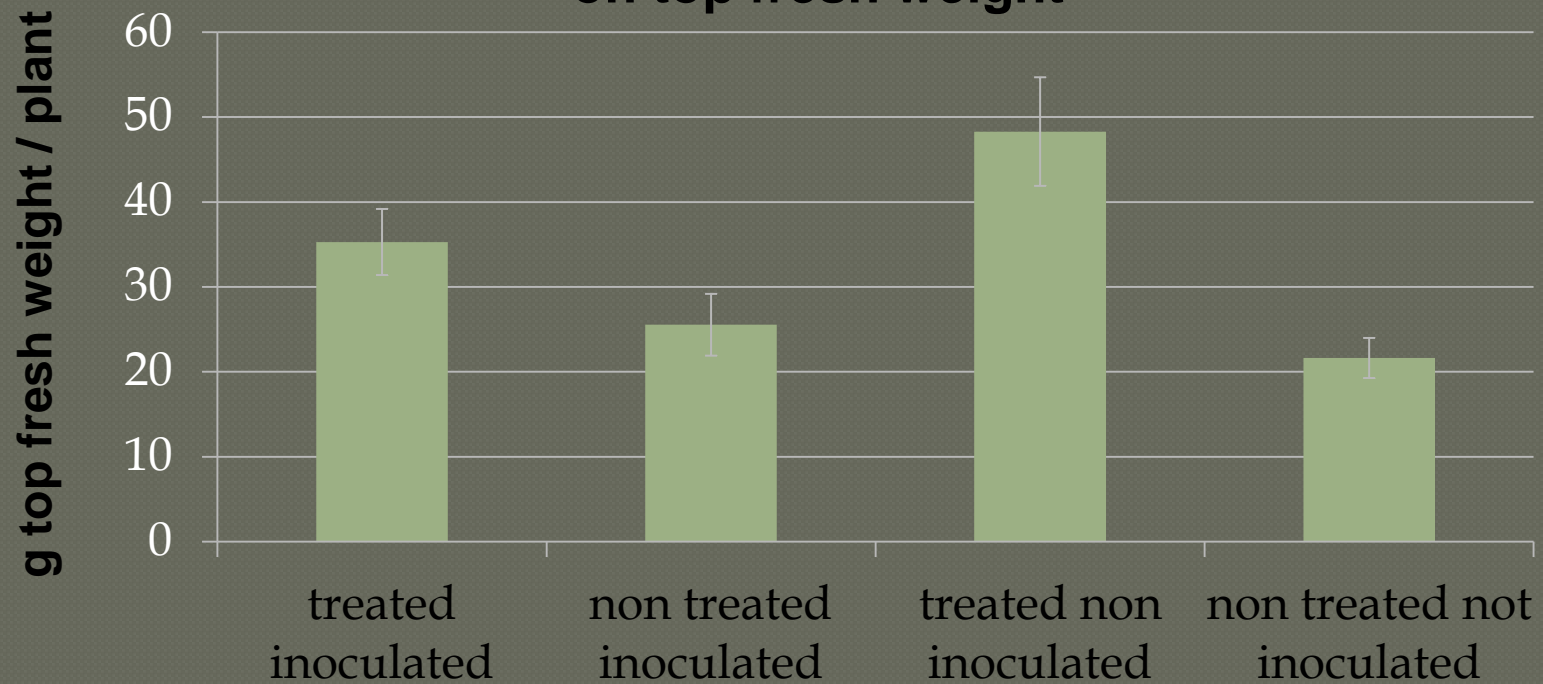
**Nematode-infected
(non-treated plants)**



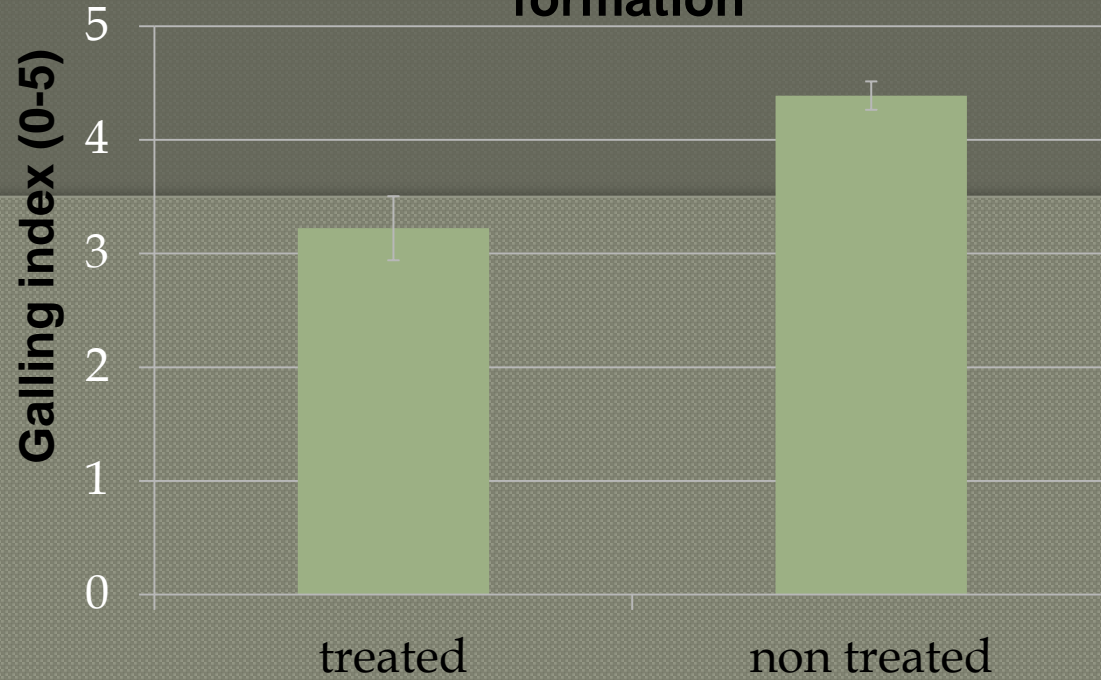
**Nematode-infected
(treated-plants)**



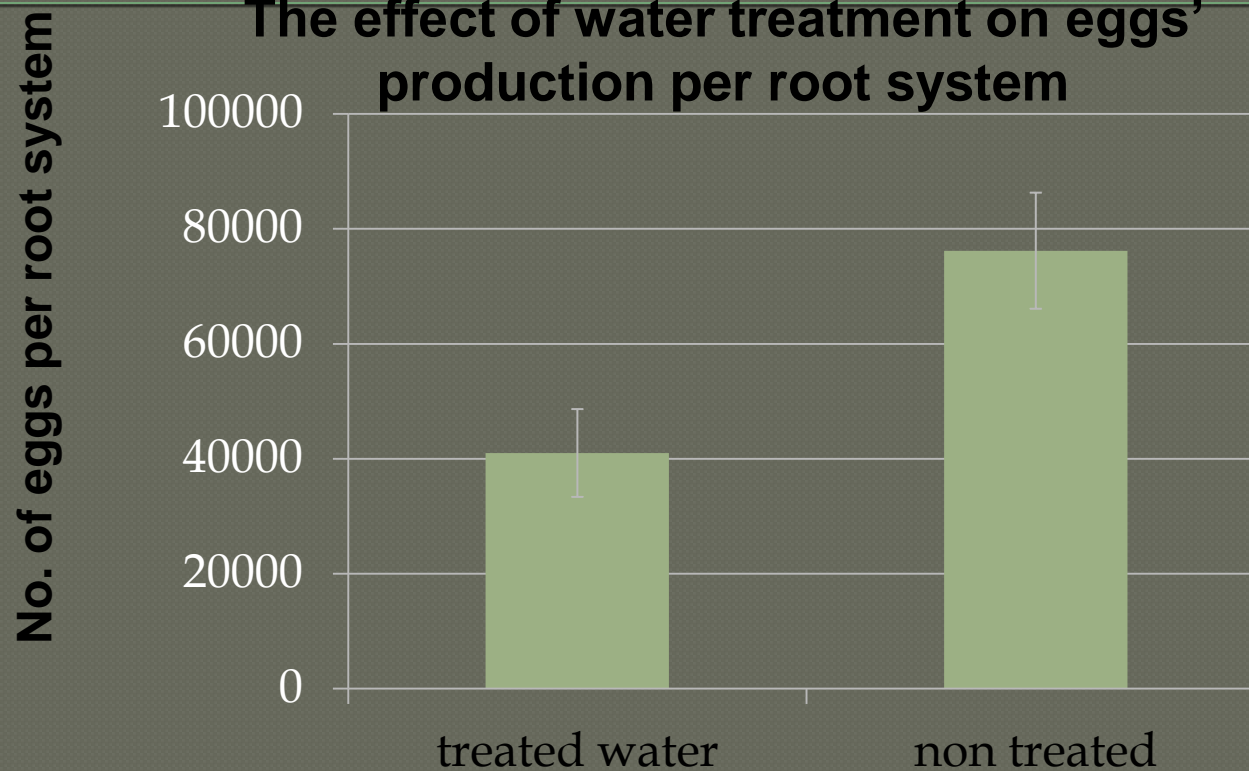
The effect of water treatment on top fresh weight



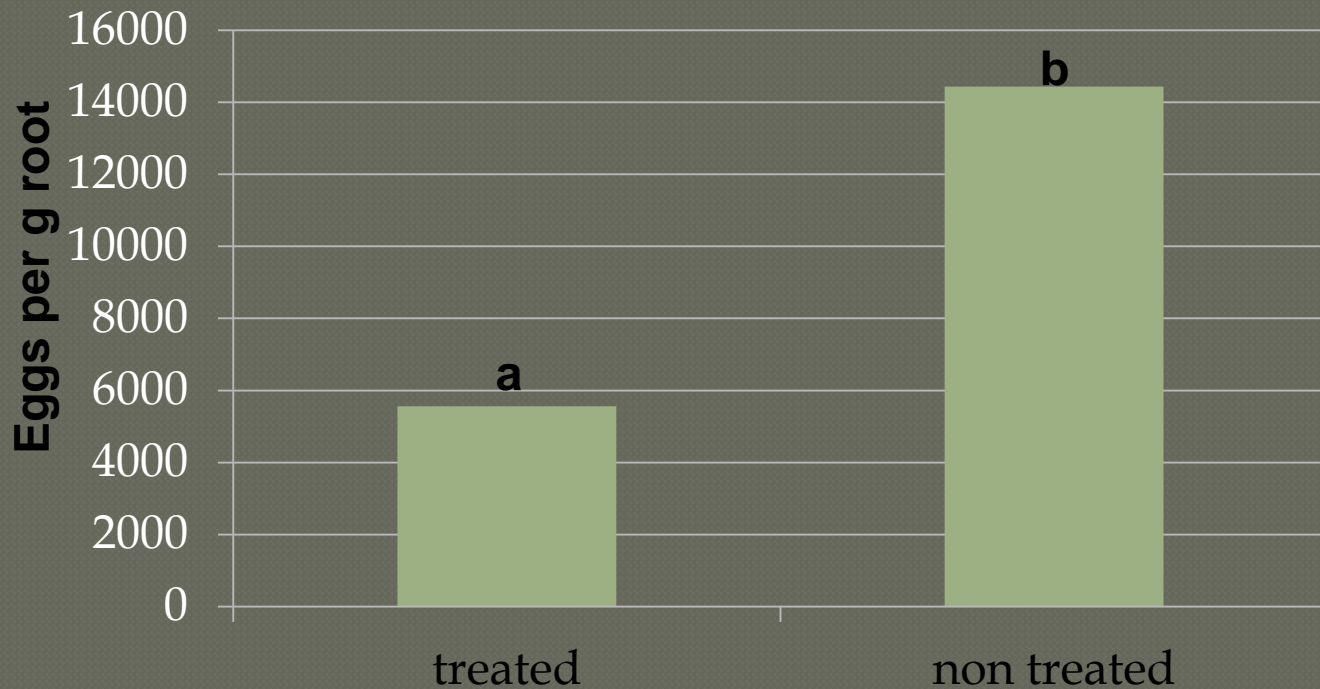
The effect of water treatment on galling formation



The effect of water treatment on eggs' production per root system



The effect of water treatment on eggs' production per g root



THANK YOU



