The new biological nematicide BioAct, its production, application and efficacy

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The Strain (251)

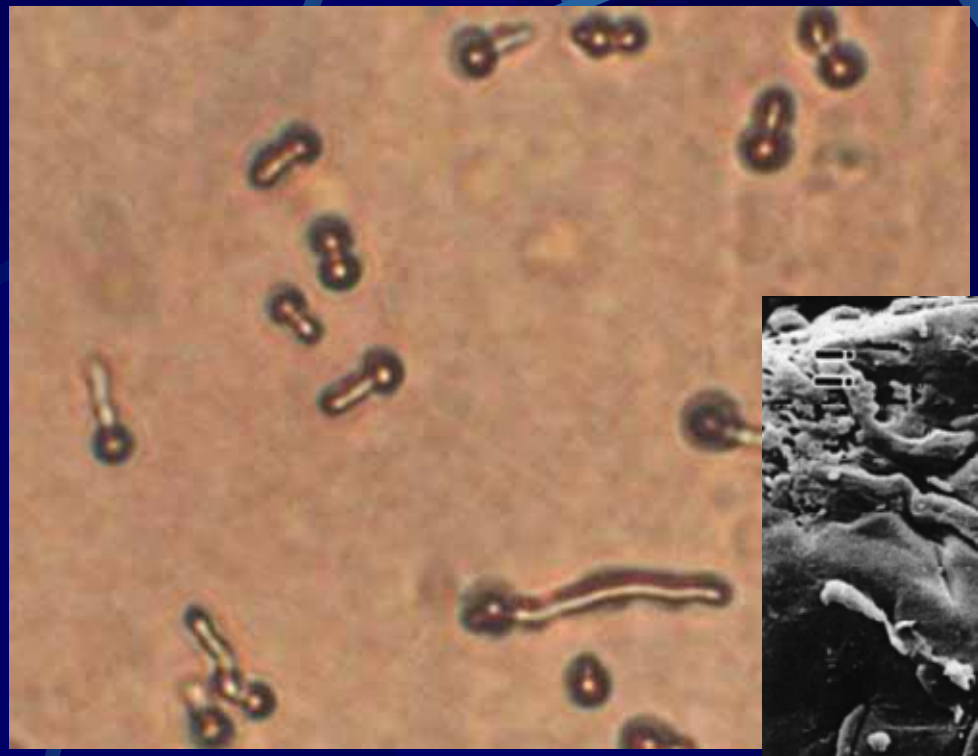
- first isolated from an egg mass of Meloidogyne incognita
- 1980 in the Philippines (University of Los Baños)
- deposited with the Australian Government Analytical Laboratories (AGAL) under the Accession No. 89/030550
- patented in:
  - The Philippines
  - The USA
  - Japan
  - Italy
  - Spain
  - France
  - Germany
  - the UK
- originally registered in the Philippines in 1989
- Prophyta overtook the strain in 2001

Mode of Action

Paecilomyces lilacinus attackes:

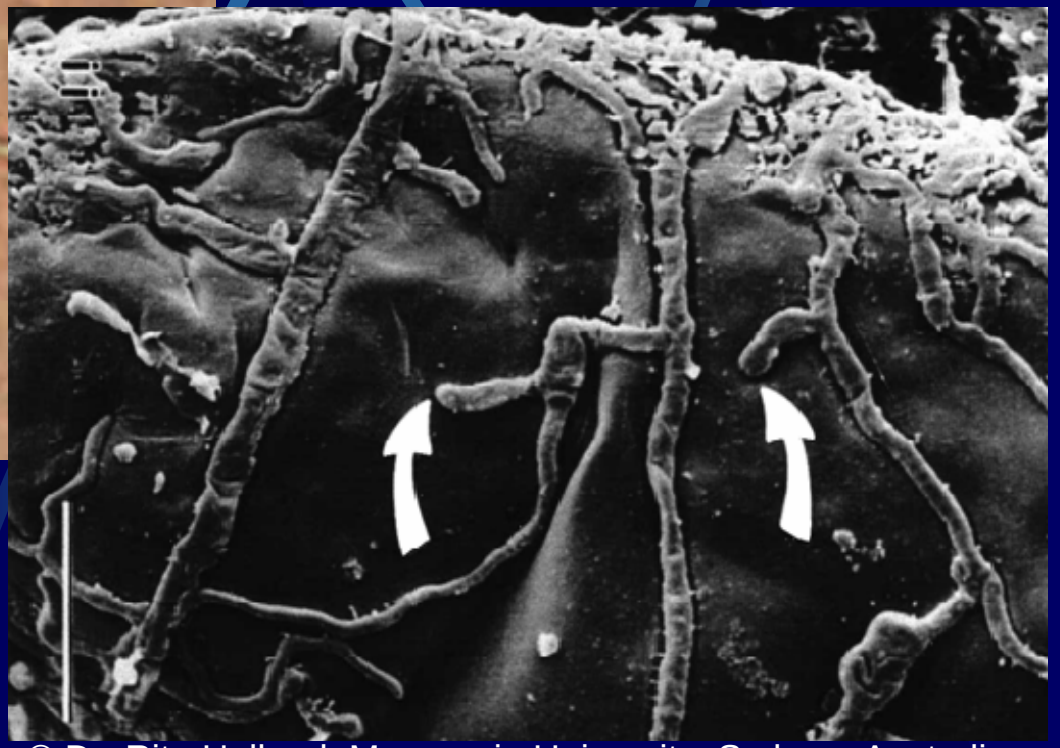
- the eggs of plant parasitic nematodes
- the vermiform stages of plant parasitic nematodes

Paecilomyces lilacinus



conidia are germinating

the fungus is attacking a nematode egg



Paecilomyces lilacinus

conidia are germinating

the fungus has killed an adult nematode of the genus Pratylenchus

Requirements to bring a biocontrol agents to the market

- cost effective manufacturing
- registration
- good efficacy and applicability (including shelf life)

Manufacturing

Filling of the fermenter

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Sterilising of the fermenter

- 121 °C
- 20 min
- vacuum technology

Incubation of the fermenters

Harvest of the fungus from the fermenter

Separation of the conidia

Registration

Tox and Eco-tox Studies

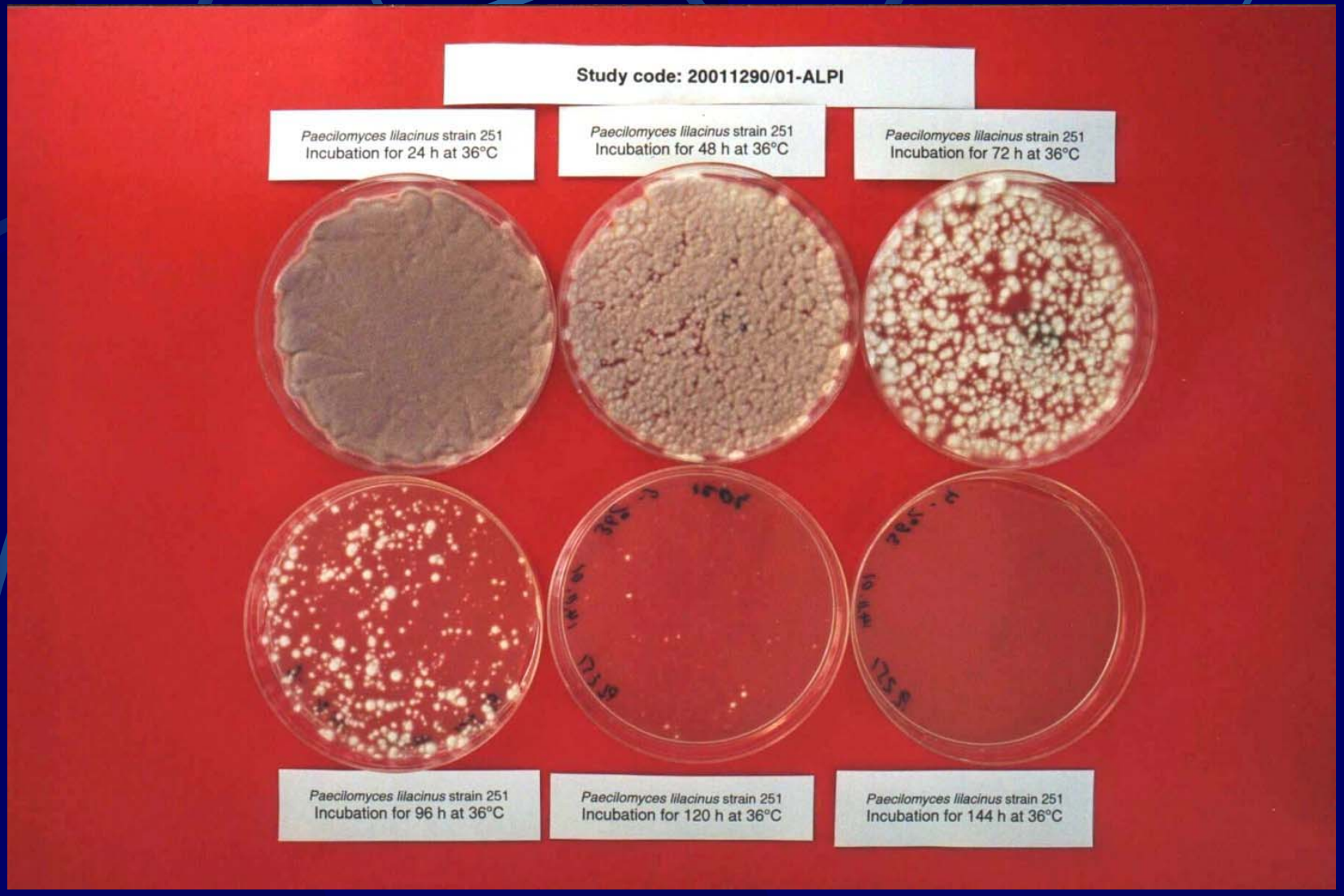
Tox studies
- oral tox
- inhalative tox
- pulmonary tox
- dermal tox
- intraperitonial tox
- eye irritation
- skin irritation
- skin sensitization
- genotoxicity on S. typhimirium

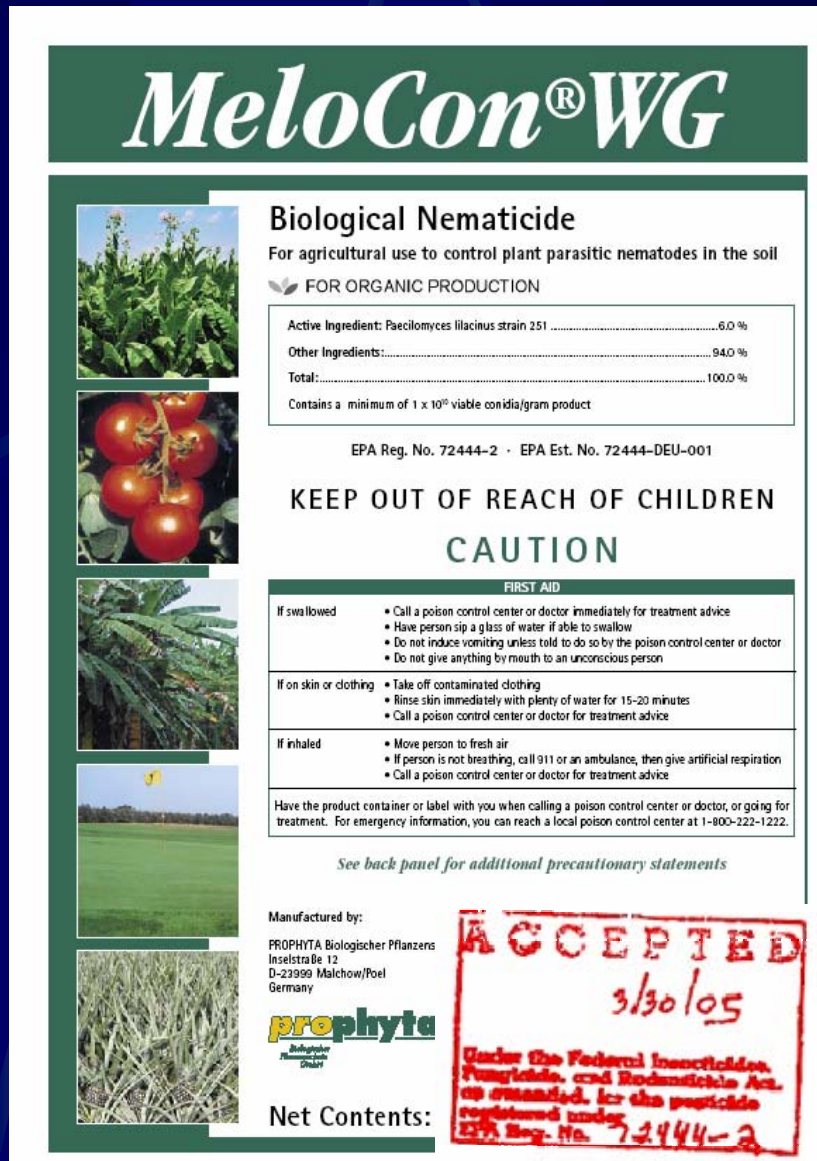
Eco-tox studies
- rainbow trout
- Daphnia magna
- Desmodesmus subspicatus
- earthworm (Eisenia fedida)
- Aphidius rhopalosiphi
- Typhhlodromus Pyri
- Poecilus cupreus
- Aleochara bilineata
- soil micro-flora

Physical and Chemical Properties

Influence of the temperature on the germination of the spores

Influence of the Temperature





MeloCon®WG

Biological Nematicide

For agricultural use to control plant parasitic nematodes in the soil

FOR ORGANIC PRODUCTION

Active Ingredient: Paecilomyces lilacinus strain 251	6.0 %
Other Ingredients:	94.0 %
Total:	100.0 %

Contains a minimum of 1 x 10^{10} viable conidia/gram product

EPA Reg. No. 72444-2 · EPA Est. No. 72444-DEU-001

KEEP OUT OF REACH OF CHILDREN

CAUTION

FIRST AID	
If swallowed	• Call a poison control center or doctor immediately for treatment advice • Have person sip a glass of water if able to swallow • Do not induce vomiting unless told to do so by the poison control center or doctor • Do not give anything by mouth to an unconscious person
If on skin or clothing	• Take off contaminated clothing • Rinse skin immediately with plenty of water for 15-20 minutes • Call a poison control center or doctor for treatment advice
If inhaled	• Move person to fresh air • If person is not breathing, call 911 or an ambulance, then give artificial respiration • Call a poison control center or doctor for treatment advice

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. For emergency information, you can reach a local poison control center at 1-800-222-1222.

See back panel for additional precautionary statements

Manufactured by:

PROPHYTA Biologischer Pflanzens
Inselstraße 12
D-23999 Malchow/Poel
Germany

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Net Contents:

ACCEPTED
3/30/05
Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 72444-2

Old formulation

- Water dispersible granule
- Carrier: Glucose
- 1 x 10^{10} living conidia per gram product
- Rate: 0.2 gram per plant
- Shelf life: 6 months at +4 °C and 12 months at –10 °C
- Applicable to control: Root-knot nematodes, lesion nematodes, burrowing nematodes, citrus nematodes, sting nematodes and others
- The product is manufactured on a pure biological basis.

New formulation

- Wettable powder
- Carrier: milk powder
- 1 x 10^{11} living conidia per gram product
- Rate: 0.02 gram per plant
- Shelf lige: 6 months at room temperature
  12 months at +4 °C
  24 month at -10 °C

BioAct®WG (MeloCon®WG) is registerd in:

- USA (after 21 months)
- Bulgaria
- The Philippines
- New Caledonia
- Italy
- Turkey
- Mexico (Myconema)

BioAct®WG is applied for registration in:

- Europe (not yet granted after 50 months)
- Morocco
- Argentina
- Costa Rica

Efficacy

Results from a pot trial in Japan (Cucumber)

2. Sowing at 7th day after drench.

	Dosage(kg/10a)	Drench volume(L/10a)	Plant growth		Living% of nematode
			Length	Weight	
1.BIOACT	0.5	5000	149	1.8	91
2.BIOACT	1.0	5000	168	2.0	96
3.BIOACT	2.0	5000	149	1.7	91
4.NEMATHORIN	20.0	5000	169	2.3	23
5.Control	-	-	87	1.3	100

	Dosage(kg/10a)	Drench volume(L/10a)	Plant growth		Living% of nematode
			Length	Weight	
1.BIOACT	0.5	10000	222	2.9	29
2.BIOACT	1.0	10000	201	2.6	28
3.BIOACT	2.0	10000	223	2.6	25
4.NEMATHORIN	20.0	10000	169	2.3	23
5.Control	-	-	87	1.3	100

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Results from GEP trials in Italy and Greece 2004

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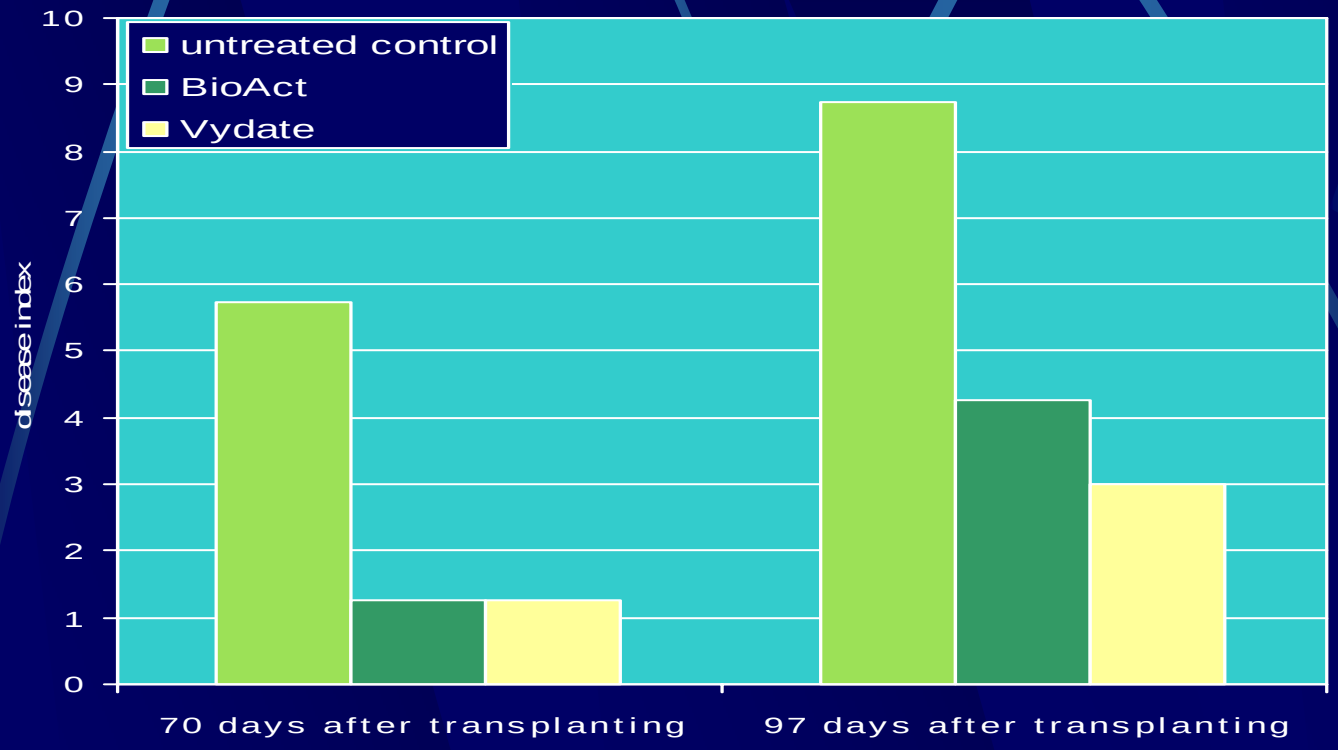
Cucumber trial in Bodeica/Patra (Achaia), Greece 2004
Nematode species: Meloidogyne incognita

Application of BioAct: 14 days prior to transplanting, at transplanting and 6 weeks after transplanting.

Disease index (0 – 10)



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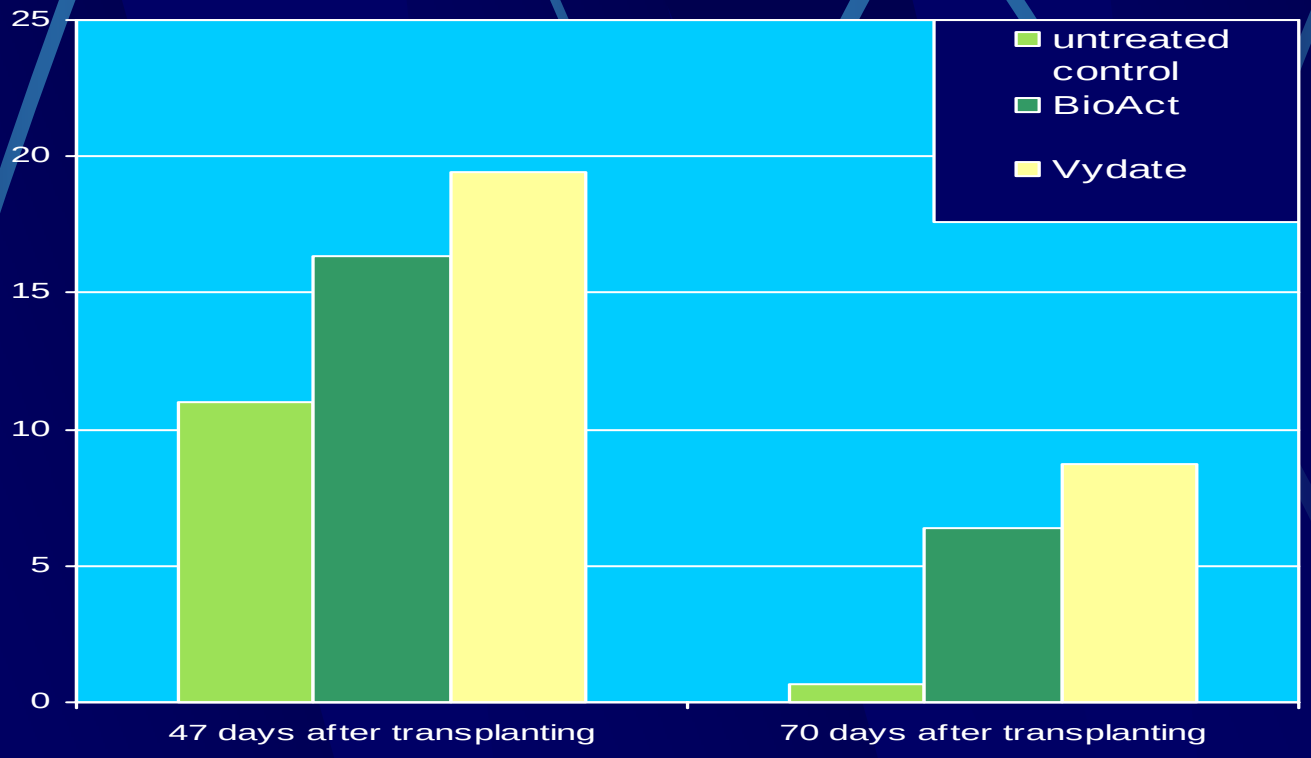
Yield (kg/plot)



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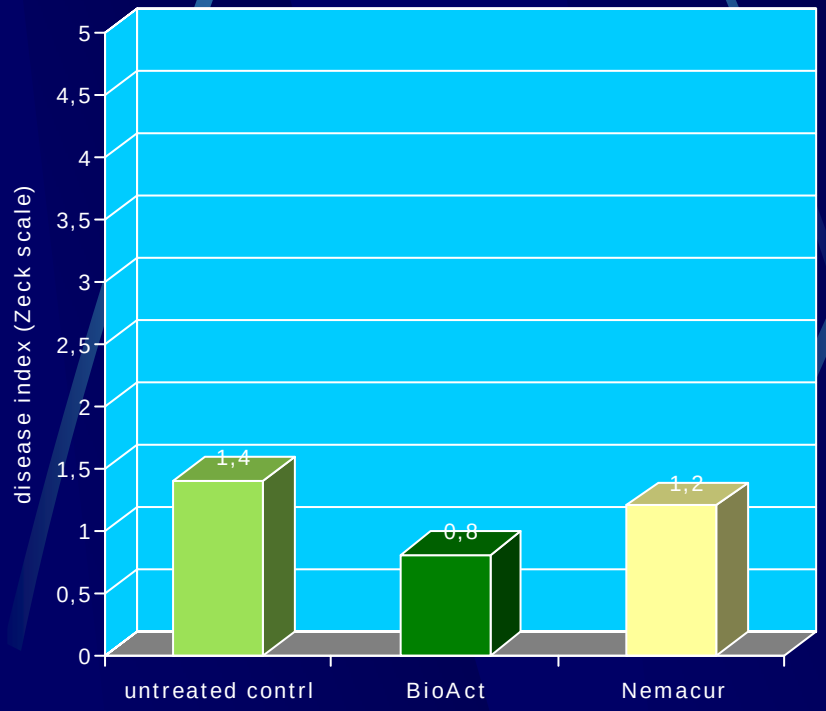
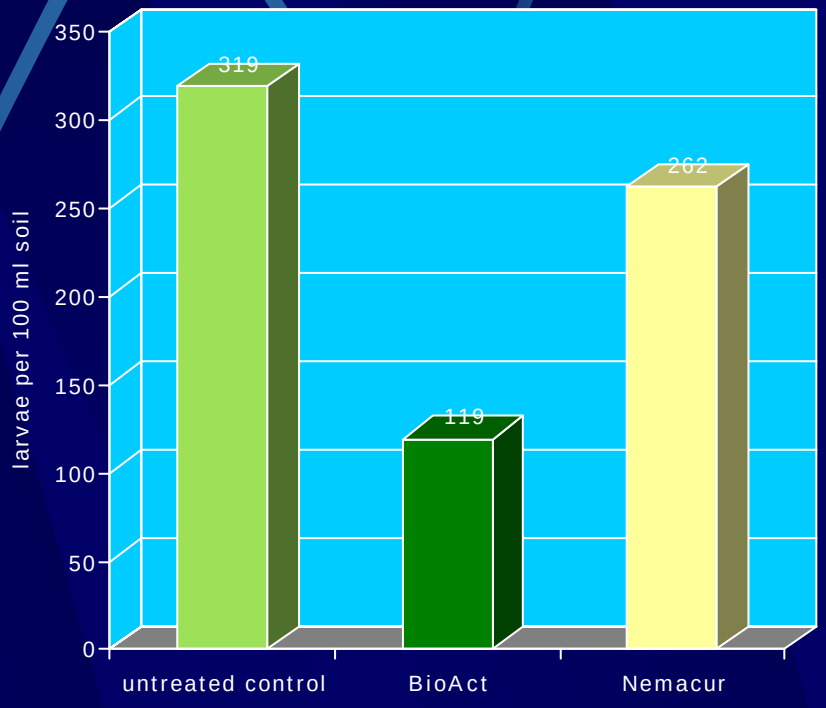
Tomato trial in Italy 2004 (Agrigeos S.r.l.)
Nematode species: Meloidogyne incognita

Application of BioAct: 14 days prior to transplanting, at transplanting and 4x in a distance of 6 weeks after transplanting.

disease index (0 – 5)



larvae per 100 ml soil



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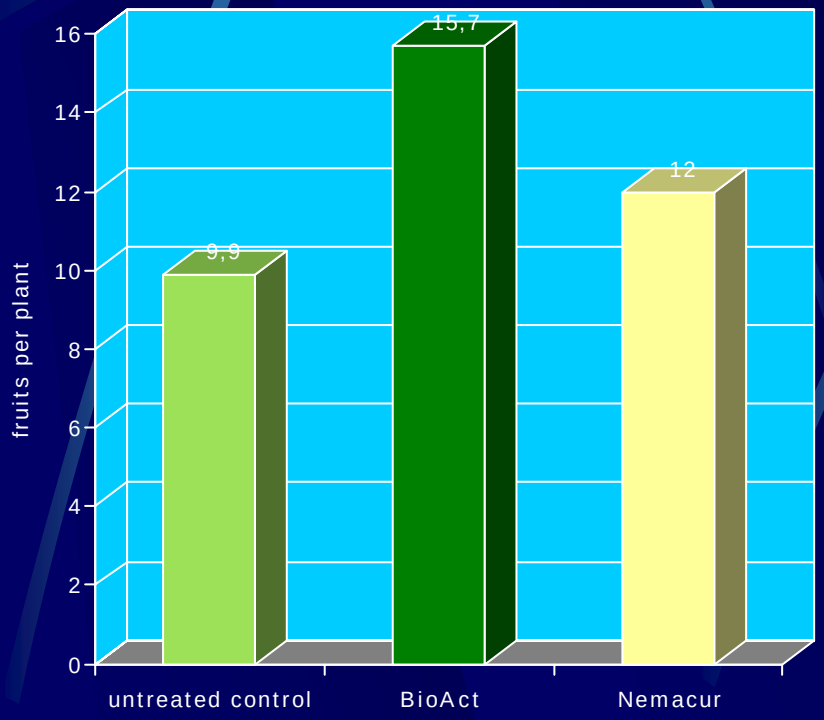
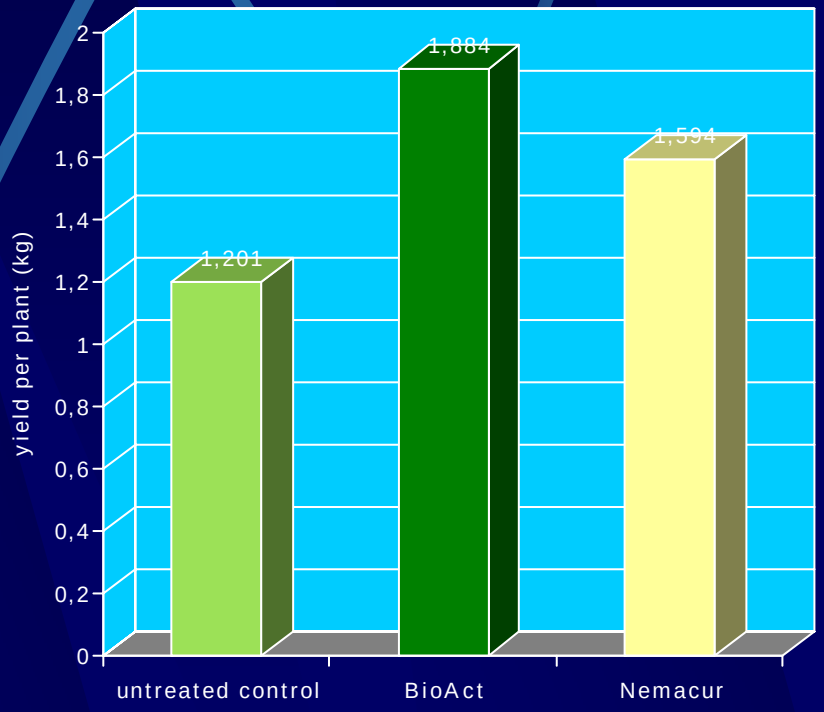
yield





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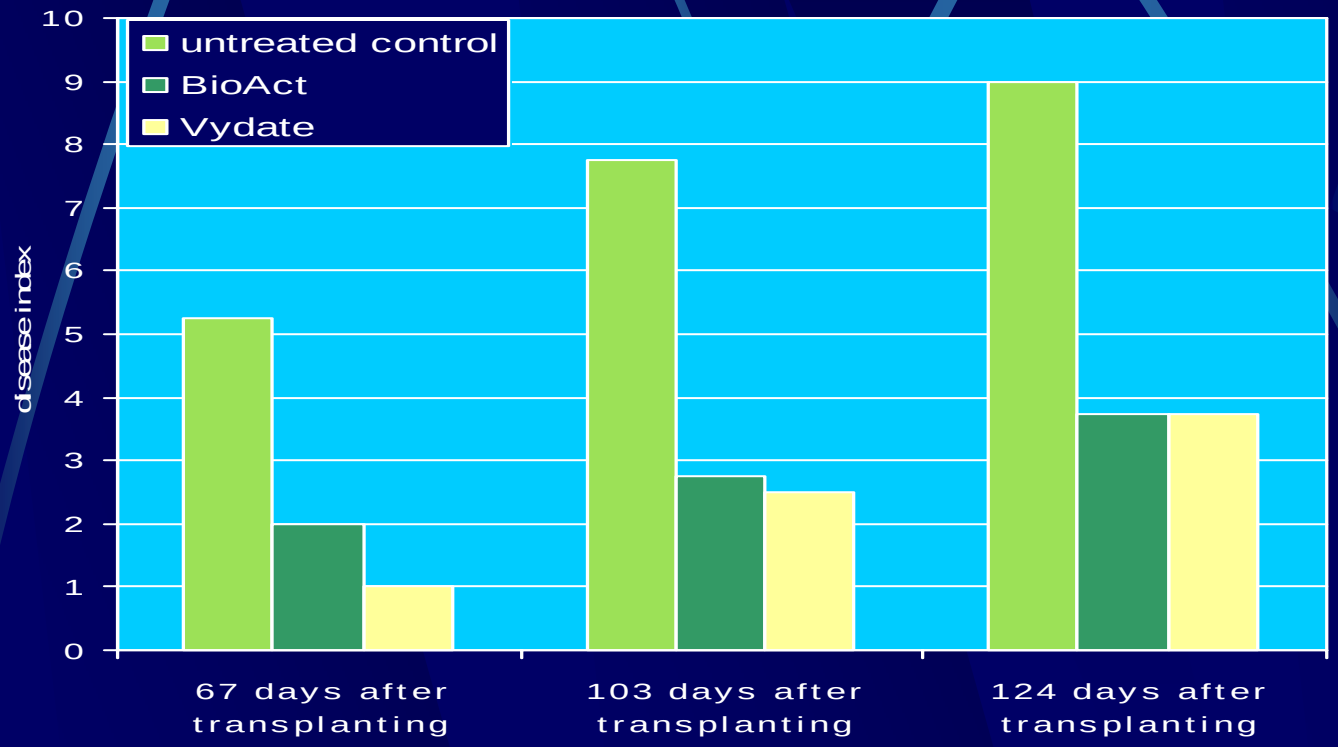
Tomato trial in Greece 2004 (GAB)
Nematode species: Meloidogyne incognita

Application of BioAct: 14 days prior to transplanting, at transplanting and 2x in a distance of 6 weeks after transplanting.

Disease index (0 – 10)



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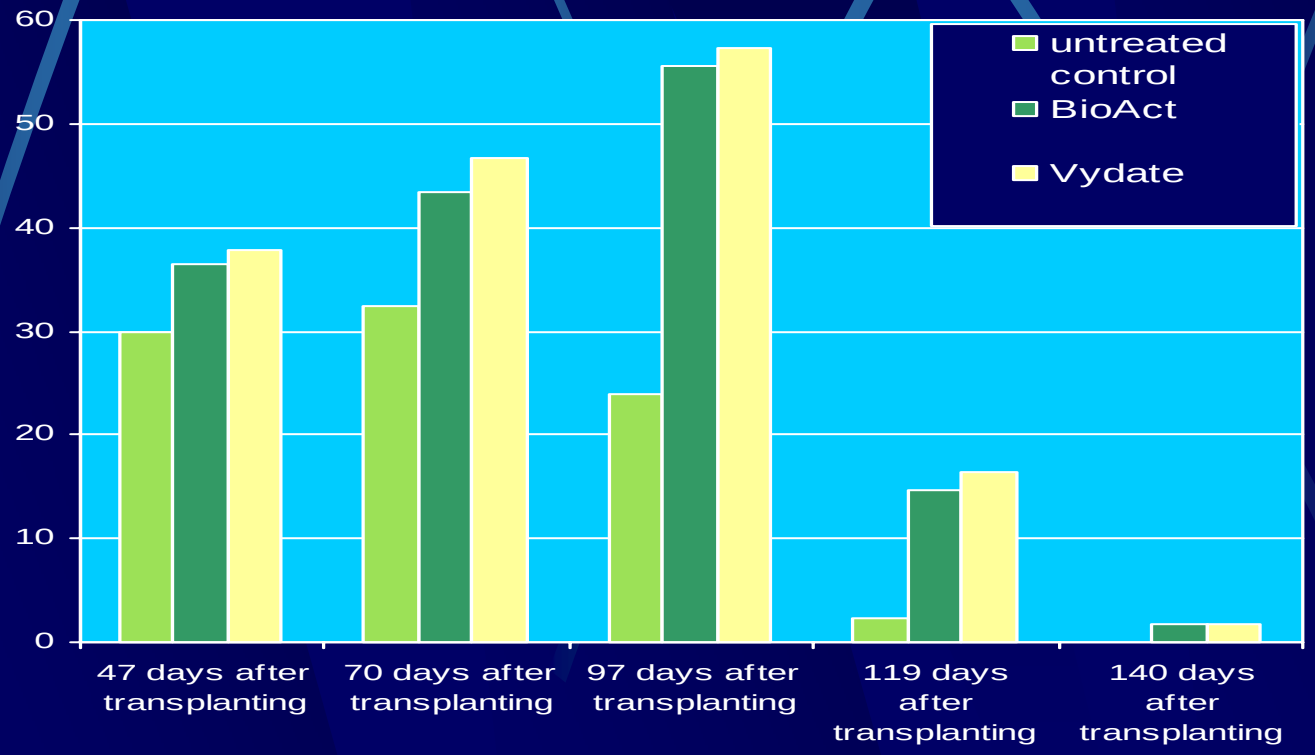
Tomato trial in Greece 2004 (GAB)
Nematode species: Meloidogyne incognita

Application of BioAct: 14 days prior to transplanting, at transplanting and 2x in a distance of 6 weeks after transplanting.

Yield (kg/plot)



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Directions for Use in vegetable production (via the drip irrigation system)

1st application (14 days prior to transplanting): 0.2 g BioAct/plant

2nd application (at transplanting): drench of the potting soil with 0.01 g per 100 ml soil

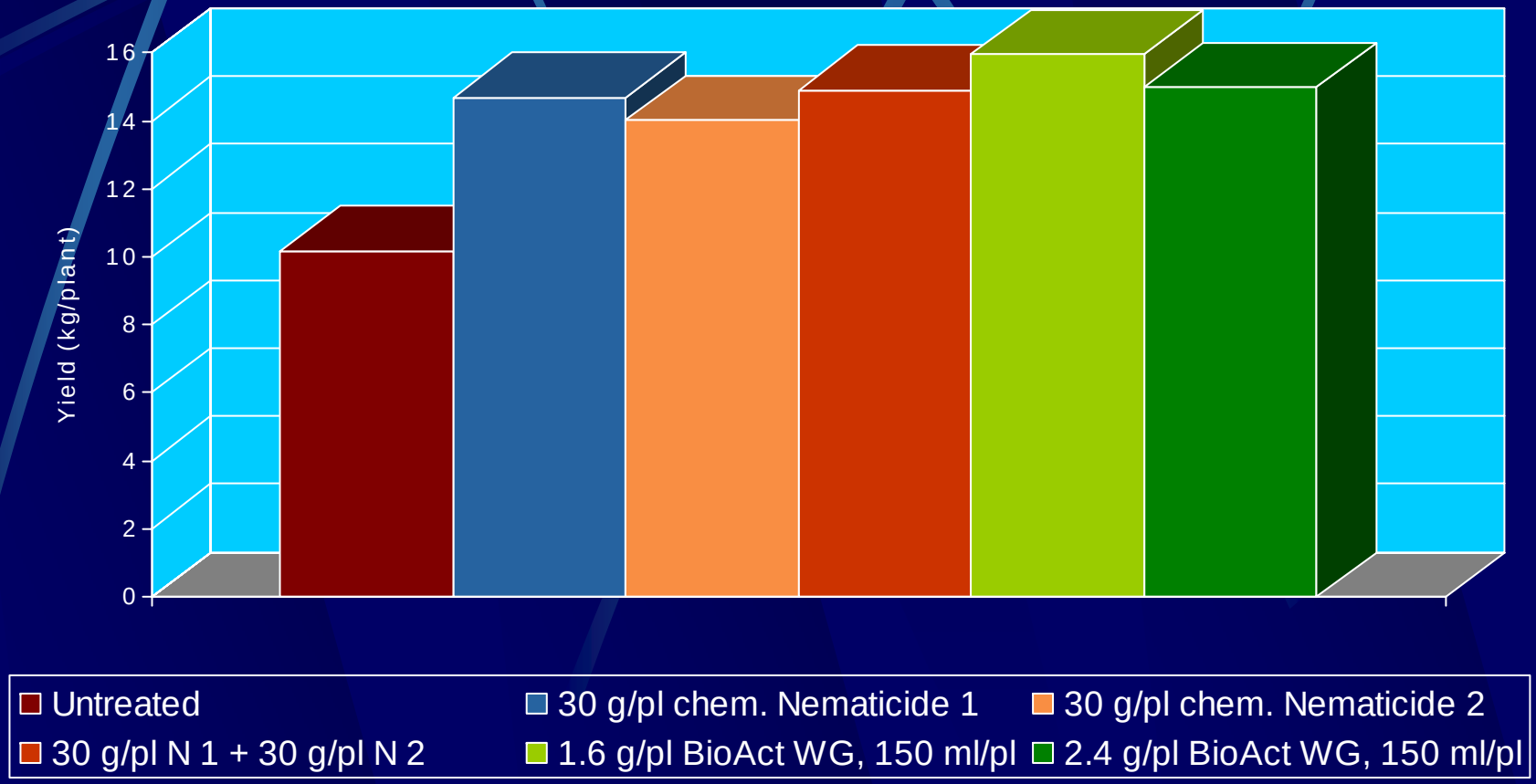
3rd application (6 weeks after trasnsplanting): 0.2 g BioAct/plant

4th application (6 weeks later): 0.1 g BioAct per plant

Results on banana

Field trial in Costa Rica

Influence of different nematicide treatments on the yield of banana plants



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Root promoting effect of MeloCon®WG

(results from a pot trial in the Philippines)

Banana roots without MeloCon®WG and without any nematodes

Banana roots with MeloCon®WG but without any nematodes

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Banana trials in the Philippines

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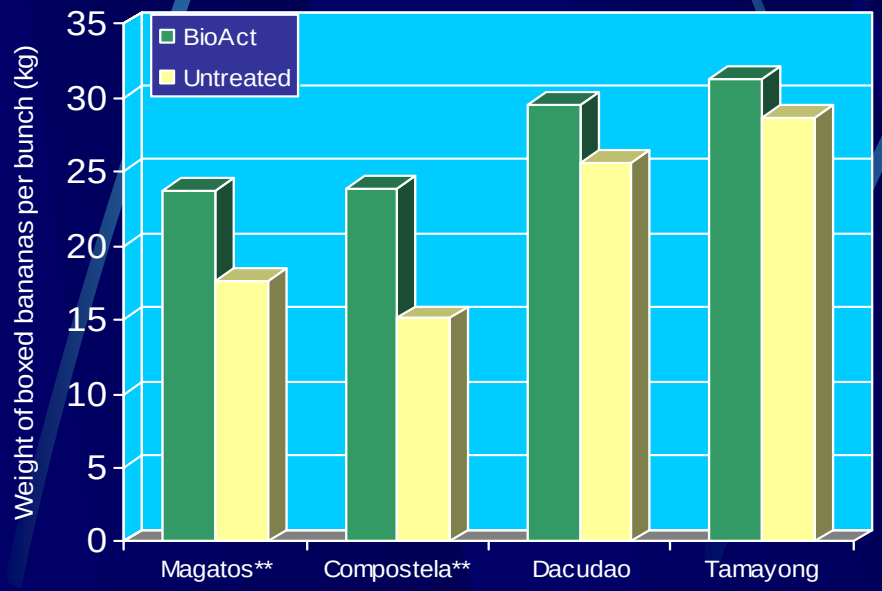
Results of Demonstration Farm Trials

BioAct treatment: 1 gram per plant every 6 months

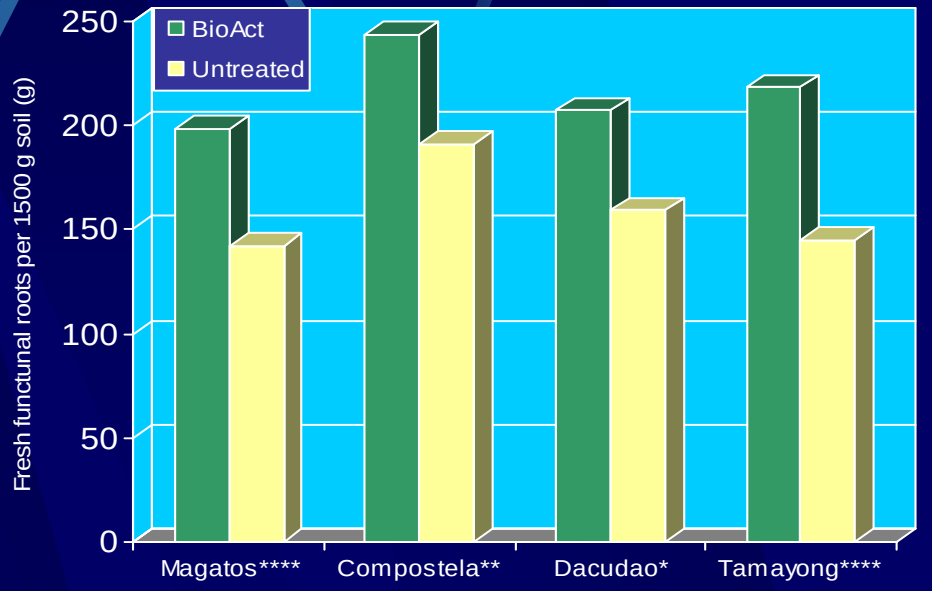
- Magatos: 6x
- Compostela: 4x
- Dacudao: 3x (initial application to the nursery plants)
- Tamayong: 3x (initial application to the nursery plants)

yield



*) Differences are statistically significant

root weight



*) Differences are statistically significant

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Conclusions

- BioAct is an effective and user friendly nematicide. It neither endangers the applicator nor the environment.
- It has to be applied with water.
- A WP formulation has been developed with a high concentration of the active ingredient, which can be used at extremely low rates.

Thank you