NEMATURAL PLUS

BOTANICAL

Nematode control
Natural solution

IMPORTED
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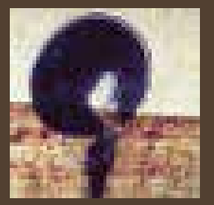
What is a nematode?

- They are the most abundant multicellular animals on earth.
- There are almost 100,000 species that inhabit practically all the ecosystems (seas, soils, inland waters, ...)
- They feed on bacteria, fungi and other nematodes, and often act as endoparasites of other animals or plants.
- They are similar to earthworms and their size ranges from one micrometerto several meters.
- Cycle: comprises three states: egg, larva and adult, and the larval, four juvenile stages.
- In the case of parasitic plant nematodes, its buccal apparatus is styletlike, penetrating the roots.
- Its life cycle is about 30 days and they produce a large number of eggs.

NEMATURAL PLUS Botanical controls plant parasites nematodes at the soil

Meloidogyne sp.

Ditylenchus sp.



Rotylenchulus

Type of nematodes

1. Meloidogyne incognita "nematode of the roots".
2. Ditylenchus dipsaci"nematode of the bulbs“
3. Tylenchulussemipenetrans"citrus nematode“
4. Heteroderaglycinus"soybean nematode“
5. Globodera rostochiensis (golden potato nematode)
6. Paratylenchus
7. Pratylenchus
8. Helicotylenchus
9. Trichodorus
10. Tylenchoryhnchus
11. Radopholus

Nematodes and their effect on agriculture:

Problematic of nematodes in soil

- In all soils there are nematodes, and not all the nematodes that inhabit the soil are phytoparasites, only a small percentage are.
- Those that are, feed on the juices that flow through the roots, extracting them by suction or introducing themselves inside them.
- They move with water flows, from lower layers, as they do not have their own mobility.
- The Meloidogyne species is characterized by forming nodules or bulges in the roots, not the other species.
- They tend to cause significant damage to the root system of the crop, preventing the proper development of the plant

Symptoms of a cultivation affected by nematodes:

There is a progressive weakening of the plant, difficult to explain a priori.

The plants seem to suffer a nutritional deficiency, are discolored, weak, wilted, which makes them susceptible to attacks of fungi, bacteria ...

They cause a degradation of the root system, preventing its development and minimizing the absorption of nutrients, until they cause death.

However, an acceptable population of nematodes in soil, under good growing conditions, may be viable for cultivation, as they will always be present.

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Chemical nematicides:

There is a large amount of phytosanitary products in the market with nematicidal effect, which are really products of high toxicity that act as soil disinfectants.

Its application eradicates all types of microbial life in the soil, they are not selective.

After the application of these types of products the soils are exempt from any microbial population, both beneficial and harmful; with the consequent damage to the crop, since the bacterial load of the soil is necessary for the degradation of the organic matter and transformation of the nutrients in forms assimilable by the root, so it plays an important role in the life cycle of every plan.

This type of product initially controls the population of nematodes, but what it is doing is somehow stimulating the remaining population in deeper layers of the soil to increase its proliferation level, and in the medium term a more severe attack occurs.

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Nematural PLUS procedure

It is about using a combination of different plant extracts, mainly with ovicidal power, and with a repellent and toxic power for adults.

The product acts by controlling the eggs of nematodes and the oviposition of the females, preventing their germination; in this way the coming populations will be controlled.

It is not intended to control 100% of the current population of nematodes, but the following generations, which represent the real problem, the current populations only live about 30 days.

It is not intended to eradicate 100% of the population of nematodes, but to maintain it at an assimilable level and acceptable to the plant.

It is not a toxic product for the microbial life of the soil, it will not affect it at all.

Composition and performance of Nematural PLUS

The product is formulated based on different plant extracts with ovicidal properties that also inhibit the oviposition of females.

Parallel has a repellent and toxic effect for adults.

The extracts come from plants of the families of the Aalilacea, amaryllidaceae, canelliaceae, grasses.

The way of acting is by inhibiting the reproductive capacity of the females and by the degradation power they have on the eggs, limiting the proliferation of the coming populations.

Composition	%w/v
Plant extract (Gramineae Sp.)	70,0%
Phosporus (P_2O_5)	8,0%
Potassium (K_2O)	4,0%
L-Amino Acids	2,0%

Advantages of Nematural PLUS against the use of chemical nematicides:

- A chemical nematicide eliminates any microbiological load of the soil from the day of application, and will prevent a nematode attack from recurring as long as there is a lethal dose in the soil (a few days). It will only act in a few centimeters of soil, where the root bulb is located, below it there is still a population of nematodes.

- As the product degrades, the lethal dose becomes a stressful dose, it no longer kills, but what it does is "stimulate" the nematodes of lower layers so that they reproduce in a more prolific way, since it is a defense mechanism in front of the threat that supposes "something harmful" that is in the ground.
When the effect of the nematicide has disappeared (20-30 days) the attack of the new generation will be much stronger, which has aggravated the problem, another new application must be made, and so on.

- However, the root of the plant, since the soil is devoid of microbiological fauna, has no capacity for regeneration and absorption of nutrients.

Advantages of Nematural PLUS against the use of chemical nematicides:

- The product controls the second generation of nematodes, since the life of the first one is about 20 or 30 days.
- The advantage is that it does not present any toxicity to the soil microbiology.
- It does not cause the stimulation of the nematodes that remain in the soil, so that over-oviposition does not occur.
- The development of the root system of the plant is stimulated, so that the recovery of the crop is faster than if a chemical disinfectant was applied.
- The results of the product can be observed 15 days after application and maintain an acceptable population of nematodes for longer than a chemical nematicide.
- Only one treatment is performed, which represents an economic saving at the treatment level.

Procedure for implementation of Nematural PLUS

The recommended dose of application of the product is 3 to 5 L / Ha, making a single application 15 days after the transplant, as a general rule.

Case of strong soil infection: make an application of half the dose 15 days before the replant and the other half at 15 days after the transplant.

Meloidogyne incognita

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Cultivations sensitive to nematodes:

The main crops that usually have nematode problems (everything will depend on the soil conditions), will be mainly:


Tomato


Banana


Cucumber


Watermelon


Cotton


Rice


Peach


Cantaloupe


Eggplant


Cereals

Tomato trials

DEMOSTRATIVE TRIAL:

Location: Greenhouse under Polycarbonate in VALENCIA (Spain)

Cultivation and Variety: tomato var Naxos long life

Initial conditions: high level of infestation (18 eggs + juveniles / ml soil) by the nodular nematode Meloidogyne incognita.

Dose used: 5 L / ha

Time of appplication: 5 days after trasplanting

CONTROL

45 days

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45 days after application

Banano trials

TEST OBJECTIVES:

The main objective of the trial is to evaluate the effectiveness in the control of nematodes in an infected soil of a banana plantation.
The response of the plant will be controlled by observing the vigor of the child.
The reduction of the number of nematodes in soil will be controlled.
The number and evolution of root absorbent hairs will be visually controlled.

TEST PARAMETERS:

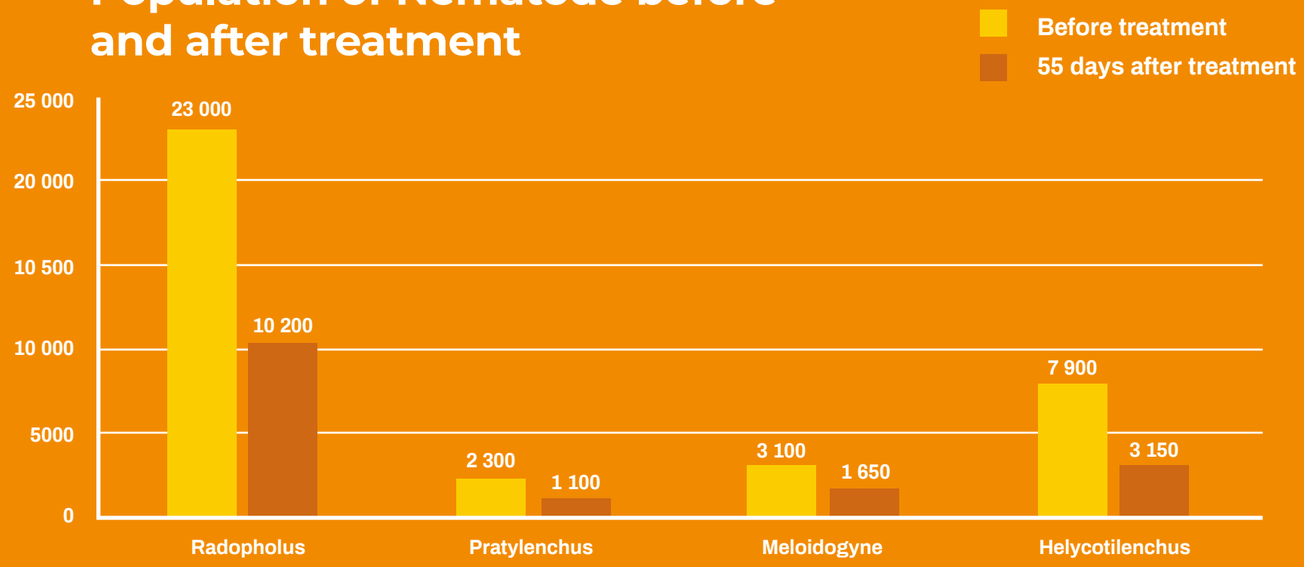
Location: Quevedo, Ecuador (AGRIMEN COMPANY FARM, 2018)
Controlled surface: 2 Ha
Plantation density: 1200 plants / Ha
Treatment dose: 8 L / Ha

A single treatment via soil at the beginning of the cycle
Population count of nematodes before treatment
Final nematode count, 55 days after treatment.

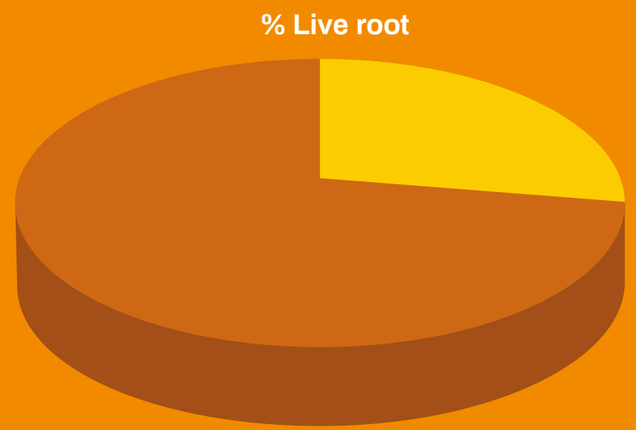
Banano trials

COUNTS	Radopholus	Pratylenchus	Meloidogyne	Helycotilenchus
Before treatment	23000	2300	3100	7900
55 days after treatment	10200	1100	1650	3150

Population of Nematode before and after treatment



Banano trials results



SONAR AGRO S.L.
export@sonaragro.com
www.sonaragro.com

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