



**BIOINPUTS STRATEGY AS AGRICULTURAL
CONVERSION TO SUSTAINABLE AGRICULTURE**

Challenges of modern agriculture



Changes in consumer

- High quality food: healthy and safe
- Reduced exposure to pesticides
- Organic production

High pesticide consumption

- 336 thousand tons, 511 thousand cubic meters pesticides
- human and environmental pollution
- Traces of pesticides

Optimize production processes bioinputs

- Testing efficiency and effectiveness
- Optimization of processes
- Market positioning

BIOQUIRAMA SAS offers services agronomic efficiency of bio-agricultural use tests for which has a team of professionals with extensive experience and recognition in the agricultural sector and has an infrastructure of greenhouses, laboratories and equipment to ensure attention to needs of our customers.





BIOQUIRAMA SAS provides diagnostic services plant diseases, insects, mites and nematodes and recommending solutions that will support for taking appropriate control measures.



CONTROL AND PREVENTION PLANT PARASITIC NEMATODES



Bioquirama
Ecological Solutions

POKONIA

BIOLOGICAL CONTROL OF NEMATODES,
SLUGS AND SNAILS

GUARANTEED COMPOSITION

Active ingredient
Pochonia chlamydosporia 10¹² Conidias / Liter

Inert ingredient
Acceding and natural surfactants
Reverse suspension



POKONIA
MONOECTICIDA PARA EL CONTROL DE TIEMPO,
PILOJONES, MASCAS BLANCAS Y OTRAS PLAGAS

COMPOSICIÓN GARANTIZADA
Ingrediente Activo
Biomasa bacteriana 10¹² esporas viables por mL
Ingrediente Inerte
Adhesivos y surfactantes naturales
Suspensión concentrada

Bioquirama
Soluciones Ecológicas

CATEGORÍA TOXICOLÓGICA II
USO DOMESTICO
PREALCANT

NEMATODE DAMAGE



Affected by
Meloidogyne
root

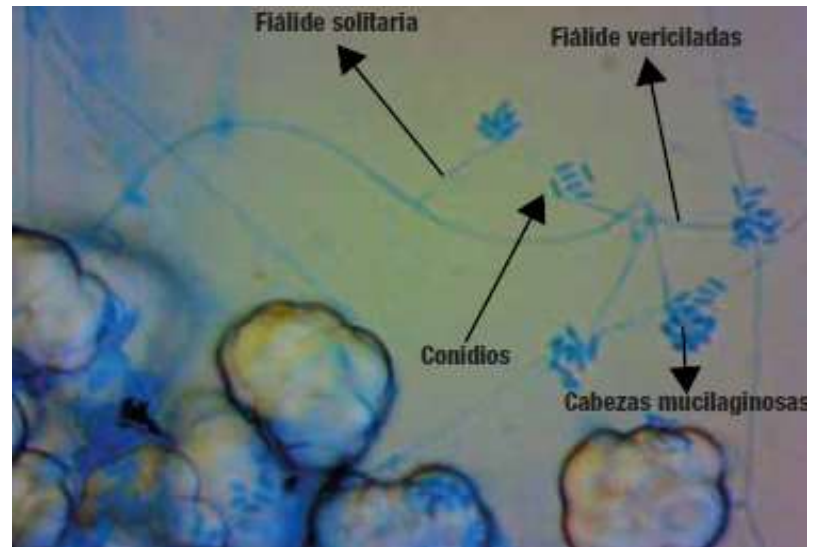


Caudate damage by
nematodes in cash
crops



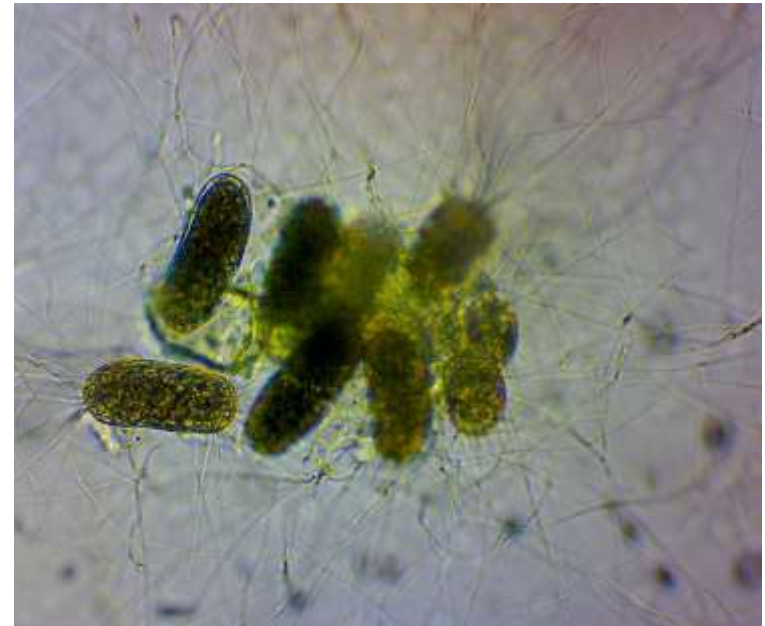
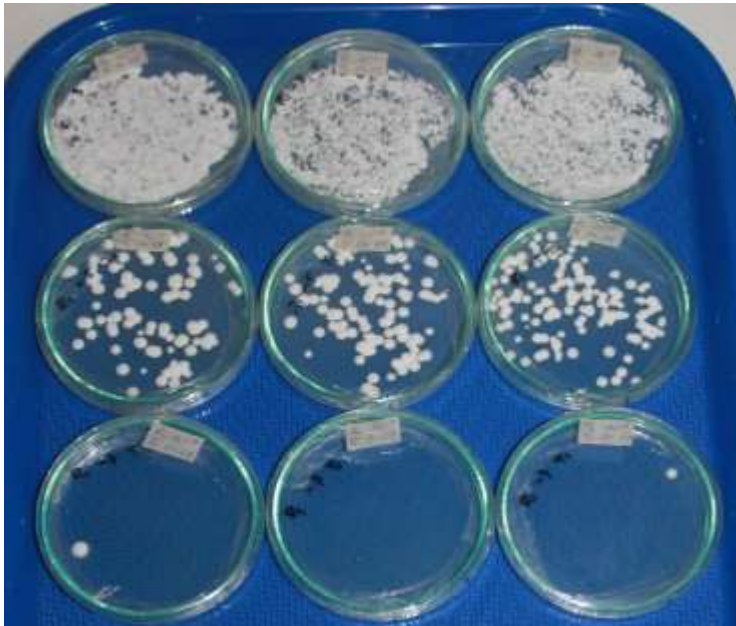
Pochonia chlamydosporia
affecting eggs of
Meloidogyne

IDENTIFICATION AND CHARACTERIZATION OF MUSHROOM POCHONIA CHLAMYDOSPORIA ALTERNATIVE FOR CONTROLLING NEMATODES



Isolation and culture of Pochonia chlamydosporia

ISOLATION, PURIFICATION AND IN VITRO TESTS TO EVALUATE Pathogenicity of *Pochonia chlamydosporia* CONTROL OF EGGS *Meloidogyne*



Control Egg by Pokonia

EVIDENCE OF EFFECTIVENESS IN COMMERCIAL CROPS



CONTROL AND PREVENTION OF MITES FITO PARASITES



MIXOMITE C.E.

INPUT FOR AGRICULTURAL USE
BIOLOGICAL ACARICIDA

GUARANTEED COMPOSITION

Active ingredient

Hirsutella thompsonii 0.5×10^{12} conidia /Liter
kanthomyces johnsonii 0.5×10^{12} conidia /Liter

Inert ingredient

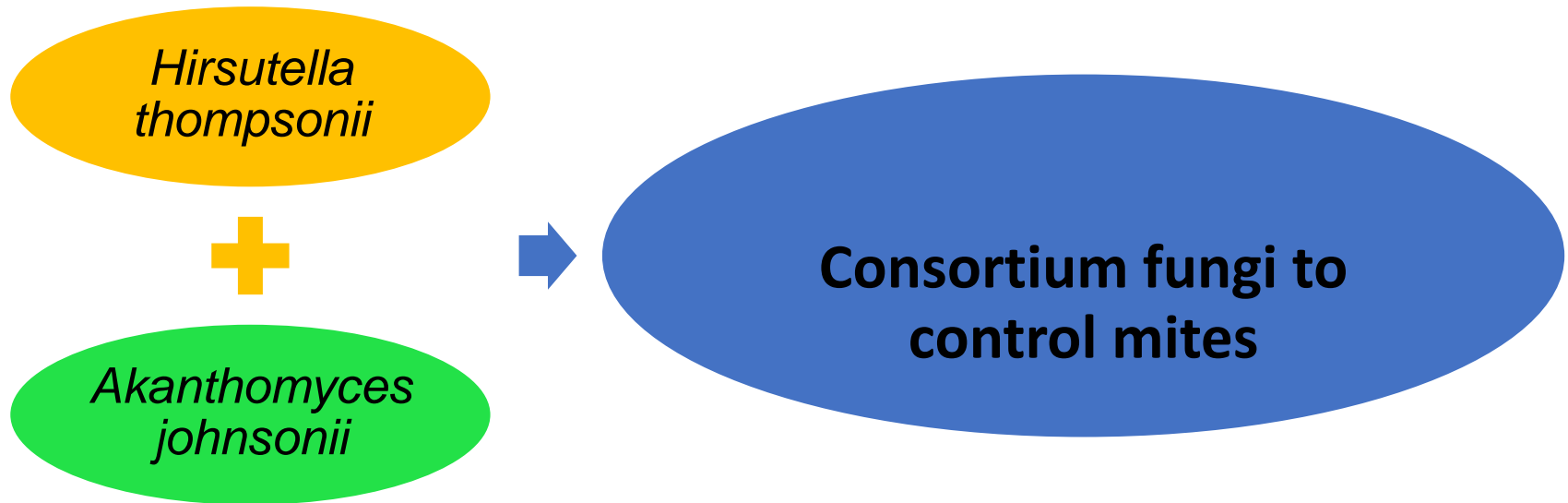
Acceding and natural surfactants
Reverse suspension



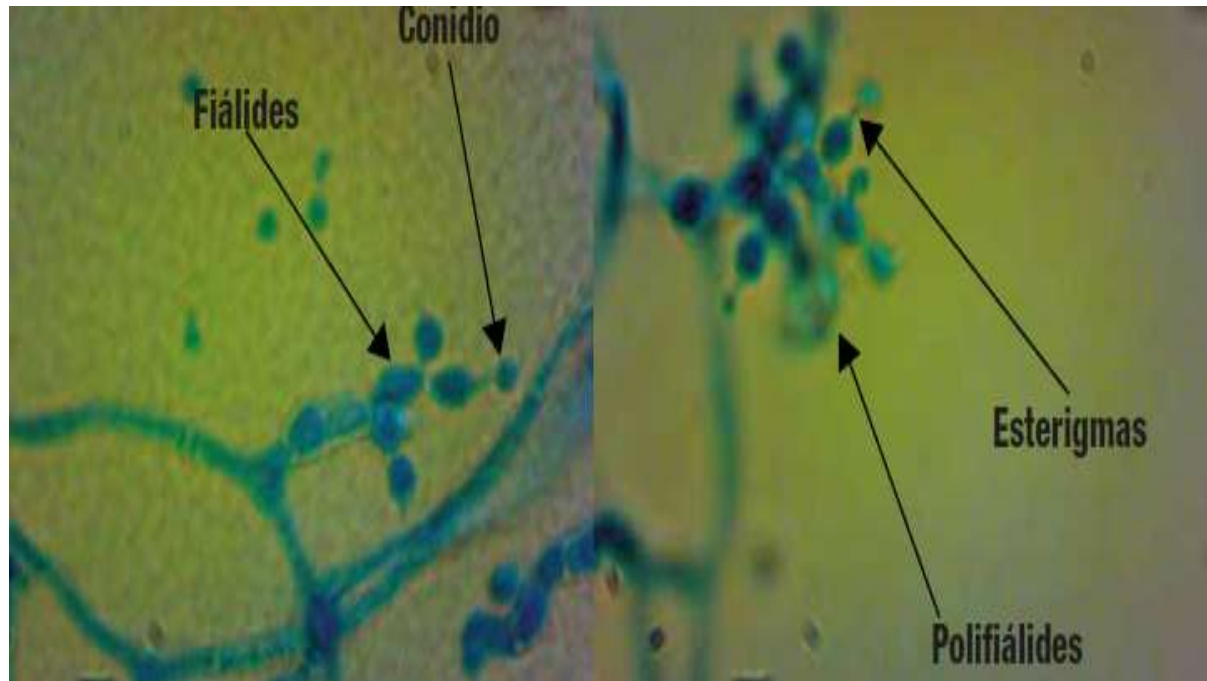
DAMAGE CAUSED BY MITES FITO PARASITES



Two fungi were isolated for controlling
plant parasitic mites



Hirsutella thompsonii



Compatibility testing *Hirsutella thompsonii* y
Akanthomyces johnsonii



EVIDENCE OF EFFECTIVENESS IN COMMERCIAL CROPS



PREVENTION AND CONTROL BACTERIA AND FUNGI



PROMOBAC

BACTERIA ANTAGONIST
SOIL BIOINOCULANTE
PROMOTER OF GROWTH OF THE PLANTS

GUARANTEED COMPOSITION

Active ingredient

Bacillus subtilis 10⁸ ufc/ mL

Bacillus pumilus 10⁸ ufc/ mL

Bacillus amyloliquefaciens 10⁸ ufc/ mL

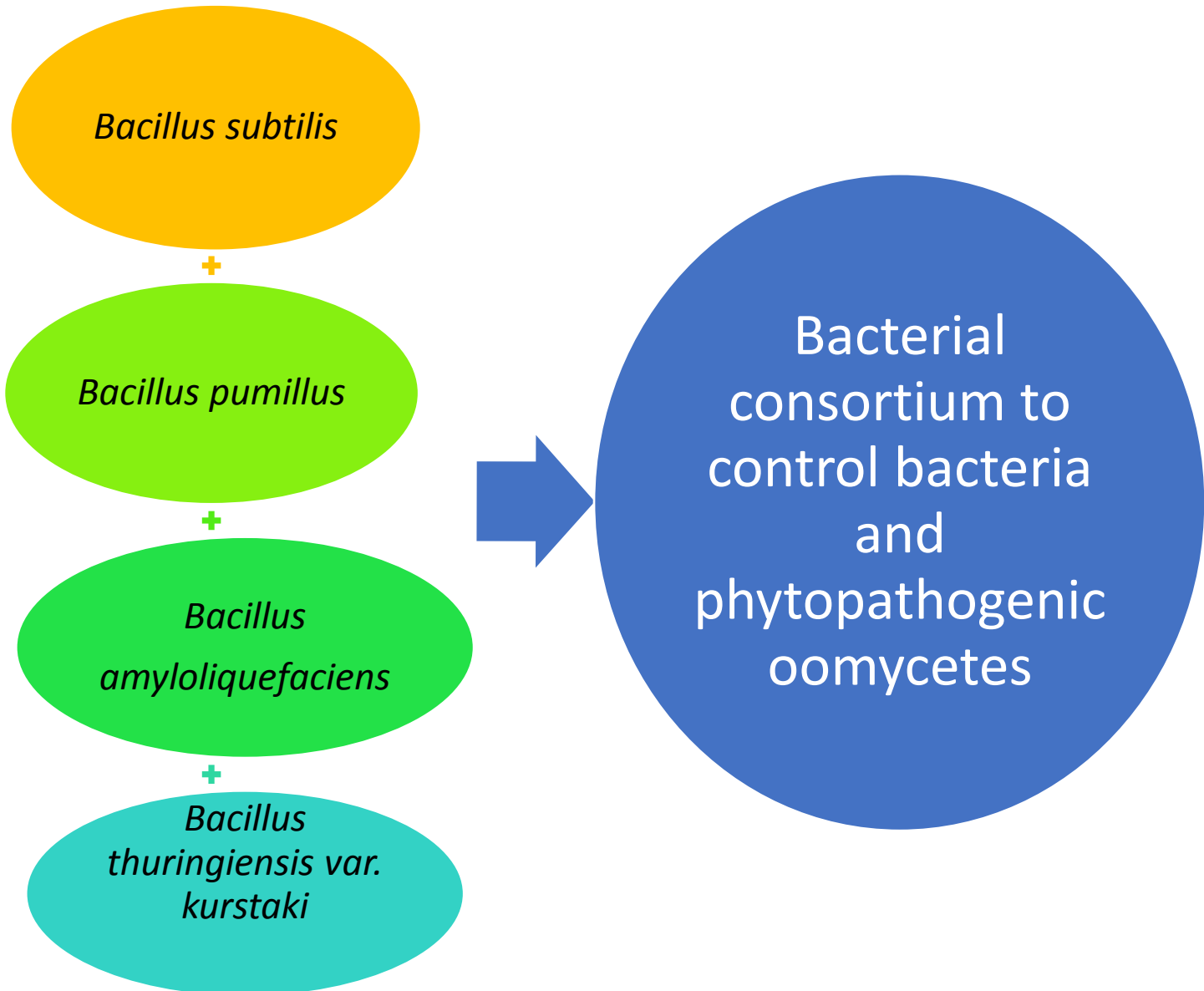
Bacillus thuringiensis var. kurstaki 10⁸ ufc/ mL

Inert ingredient

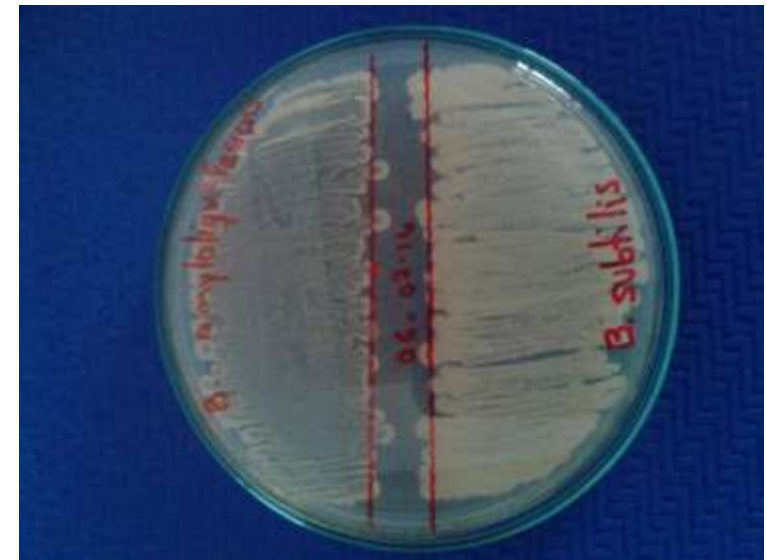
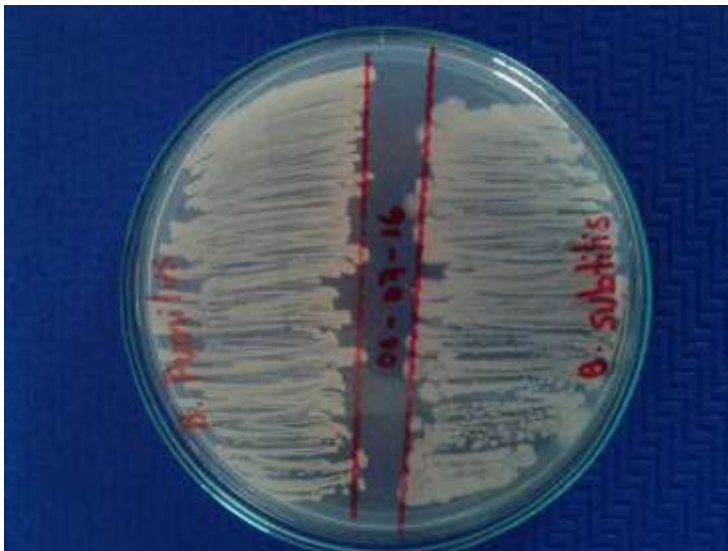
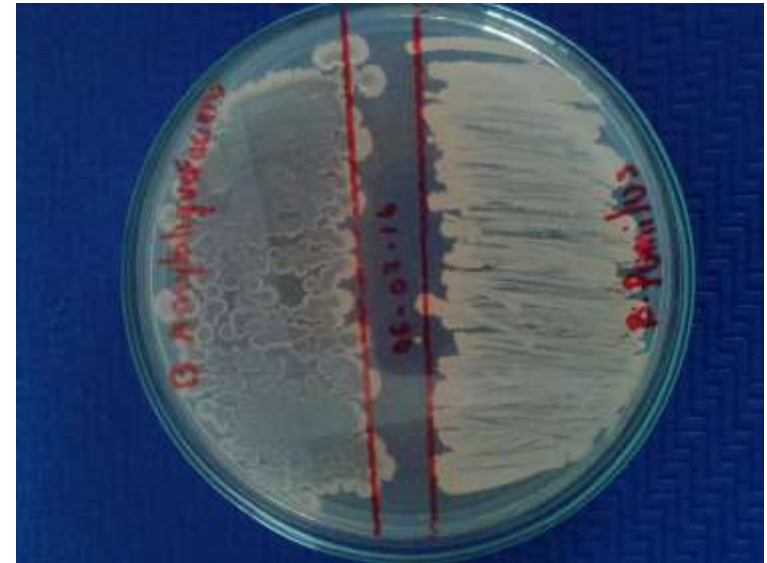
Acceding and natural surfactants
concentrated suspension



bacteria were isolated four control
Ralstonia solanacearum y *Phytophthora infestans*



Compatibility tests between bacteria



Confirmation of the identity of the isolates, partial sequences 16S rRNA regions.

	280	290
Bacillus subtilis subsp. subtilis str. 168	CCAAGGCAACGA	
B. subtilis Bioquirama	CCAAGGCAACGA	
Bacillus amyloliquefaciens DSM7	CCAAGGCGACGA	

EVIDENCE OF EFFECTIVENESS OF TOMATO SEED CONTROL BOARD *Ralstonia solanacearum*



**EVIDENCE OF EFFECTIVENESS IN TRADE TABLE
TOMATO CROP FOR CONTROL
*Phytophthora infestans***



**TOMATO CROP IN
FRUCTIFICATION**



RESEARCH WITH MICRO CONTROL ENTOMOPATHOGENIC FUNGI AND BACTERIA.

ENTOMOPATHOGENIC FUNGI AND BACTERIA

Metharhizium anisopliae

Isaria fumosorosea

Beauveria bassiana

Hirsutella thompsonii

Akanthomyces Johnsonii

Lecanicillium lecanii

Bacillus thuringiensis var.kurstaki

Bacillus thuringiensis var.israeliensis

Lysinibacillus sphaericus

Purpureocillium lilacinum

CHEMICAL FERTILIZERS RESEARCH WITH MICRO AND BIOBACTERICIDAS

Chemical fertilizers and Biobactericidas

Trichoderma harzianum

Trichoderma asperellum

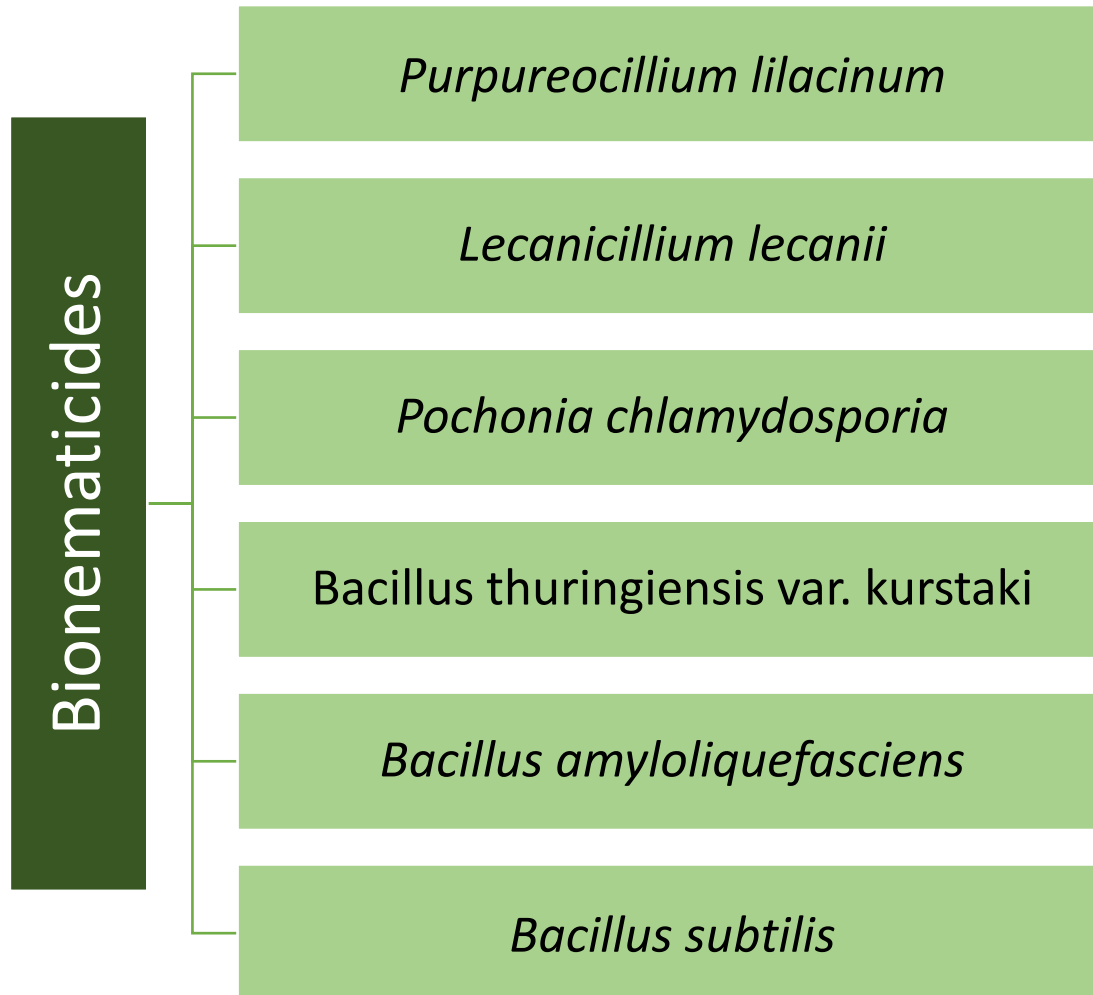
Lecanicillium lecanii

Bacillus subtilis

Bacillus pumilus

Bacillus amyloliquefasciens

RESEARCH WITH MICROORGANISMS FOR CONTROLLING NEMATODES



RESEARCH WITH GROWTH AND EXTRACTS PROMOTERS OF PLANTS

Promoters of plant growth

Bacillus subtilis

Bacillus pumilus

Bacillus amyloliquefasciens

Azotobacter vinelandii

Azotobacter chroococcum

Endomicorrizas

Vegetable extracts

Allium sativum +Capsicum annum

Equisetum arvense

Cinnamomum zeylanicum

Cupressus sempervirens
+Glycine max
+Ricinus communis

Urtica dioica

RESEARCH WITH OTHER MICROORGANISMS

OTHER MICROORGANISMS

Arthrobotrys sp

Ampelomyces quisqualis

Aschersonia sp

Streptomyces sp

ATTRIBUTES AND DIFFERENTIALS

PRODUCT AND SERVICE

	<p>Bioquirama offers the sale of a service for prevention and control of pests and diseases in crops through support and advice to producers, with bio-friendly to the environment and the health of producers and consumers.</p>

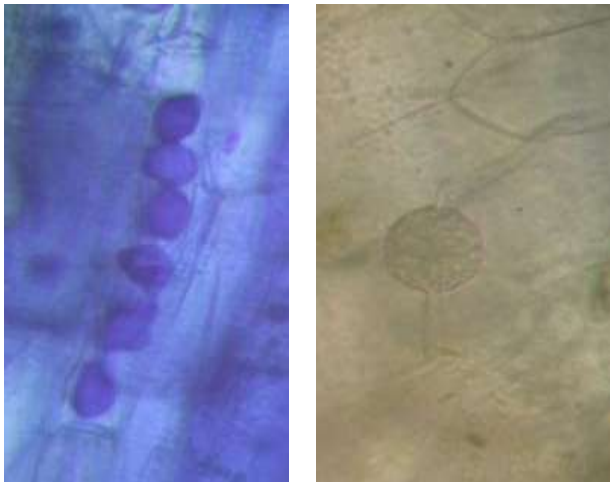
	<p>The bio-products are formulated with a novel technique reverse suspension ensures greater tolerance of microorganisms to UV rays, are released more slowly and not clog nozzles or irrigation systems and have greater efficiency.</p>

- Mixture of strains of microorganisms
- Continuous activation strains (virulence)
- Prevention and control insects, fungi, bacteria, nematodes, slugs, snails and mites.
- Growth promoters
- Prices

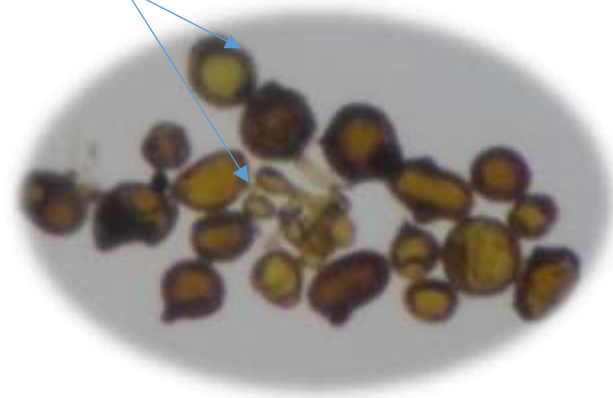
ENDOMYCORRHIZAE

Glomus fasciculatum, *Glomus mosseae*, *Glomus manihotis*,
Acaulospora rugosa and *Entrophospora colombiana*.

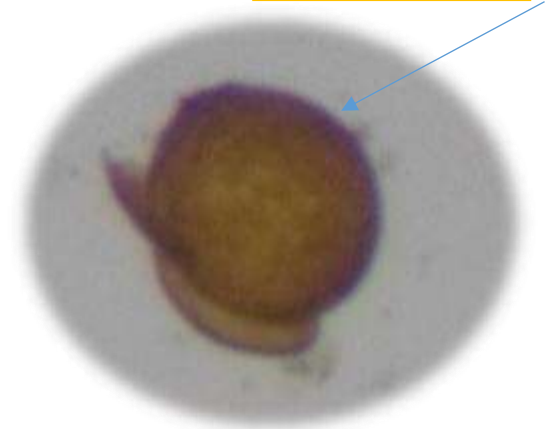
**Estate infection
Chrysanthemums by
endomycorrizas Bioquirama**



Spores Micorrizas



Germinated spore



PROTOTYPING PRODUCTION BIOINPUTS

- Scaling tests in bioreactors



- Isolation
- ID
- Obtaining pure cultures



- Bank of strains
- Reactivation of strains
- Pathogenicity tests



- Efficacy tests
- Toxicity Tests

- Highly Scaled in liquid media stir

GREENHOUSE TESTS



HYDRANGEAS CROPS MANAGED BY PRODUCTS DEVELOPED WITH BIOLOGICALLY BIOQUIRAMA



HYDRANGEAS CROPS MANAGED BY PRODUCTS DEVELOPED WITH BIOQUIRAMA



ENTREPRENEURIAL TEAM

NAME	FORMATION	RELATED EXPERIENCE
Rafael Navarro Alzate	I.Agr. Master in Plant Pathology	Researcher in Plant Pathology and Entomology
Adolfo Posada	I.Agr.	35 years in management integrated pest
Antonio J. Prieto	Biologist	35 years in Entomology
Omaira Hurtado	bBacteriologist	Over 25 years in Bacteriology
Rodrigo Patiño	Technical	Over 20 years in Biological Control Laboratory
Alba Inés Trejos	Biologist	30 years in Biotechnology

Our Team



