

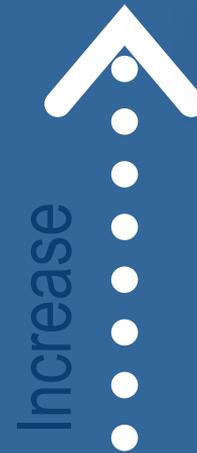


Biopesticides products - boundaries



Global market 2019
value

over
\$6 billion



Cautionary areas:

Access and benefit sharing

Technology transfer – new users

Can industry meet the demand ?

Illegal uses – unregistered products

Alternative plant protection products

Micro-organisms

Botanicals

Semio-
chemicals

Biorationales ?

Regulatory groupings

Out of scope

Entomopathogenic
nematodes

Root symbionts

Basic substances

Not PPP but may be
used for plant
protection

Registered PPP

Microorganism

Semio-chemicals

Botanicals

Biorationals

(acetic acid

fatty acids

Paraffinic oils)

Multiple modes of action

Kill host

Competition

Stimulate plant defenses

Confer plant resistance



Grey or illegal?

Plant strengthener

Biostimulant

Growth stimulant

Biological inoculant

Label claims and packet contents ≠ out of scope

Claims

A soil amendment product which acts as a natural growth stimulant.

For use on a range of crops to enhance rooting, promote growth and physically shield roots from pathogen invasion.

Beneficial fungi that live in partnership with plant roots, providing nutrition and protection.

Claim

“Biological inoculant designed to promote the establishment of beneficial plant-microbe-soil interactions in the root zone.”

Formononetin0.9%

MICROBIAL INGREDIENTS

Rhizosphere Bacillus.....725 Million/Kg

110 Million cfu/Kg *Bacillus licheniformis*

110 Million cfu/Kg *Bacillus megaterium*

110 Million cfu/Kg *Bacillus polymyxa*

110 Million cfu/Kg *Bacillus subtilis*

110 Million cfu/Kg *Bacillus thuringiensis*

110 Million cfu/Kg *Paenibacillus azotofixans*

Trichoderma harzianum.....11 Billion cfu/Kg.

NOT A PLANT FOOD

MICROBIAL NUTRIENTS.....89.1%

50.1% Maltodextrin

19% Humic Acids

14% Seaweed Extract (*Ascophyllum nodosum*)

5% Yeast Extract

1% Yucca plant extract (*Yucca schidigera*)

INERT INGREDIENTS

7% Non Humic acid components of Leonardite

2% Precipitated Silica

1% Polyethylene glycol

Claim

Mycorrhizal fungi:
“Beneficial fungi that
live in partnership
with plant roots,
providing nutrition
and protection.”

Contains:

Mycorrhizal fungi

Free-living fungi

Beneficial bacteria: Over 20 beneficial species and strains

Humates

Saponins

Microbial feedstock

Activity	\$ Millions
Research and Development	3 - 5
Formulation	1 - 2
Development	2-3 (USA) 20 - 30 (ROW)
Registration	1 (USA) 3 - 10 (ROW)
Product launch	0.1 - 20 (over > 50 global)

EU registration – about 5 years

Consequences?

Industry

Market share loss

A green square containing the text 'Industry' at the top and 'Market share loss' at the bottom. A vertical line of seven dark grey dots descends from the top, ending in a dark blue downward-pointing arrowhead.

Growers

Poor tech transfer

A blue square containing the text 'Growers' at the top and 'Poor tech transfer' at the bottom. A vertical line of seven yellow dots descends from the top, ending in a yellow downward-pointing arrowhead.

Industry

Worker safety

A teal square containing the text 'Industry' at the top and 'Worker safety' at the bottom. A vertical line of seven light green dots descends from the top, ending in a light green downward-pointing arrowhead.

Growers

Product quality poor

A yellow-green square containing the text 'Growers' at the top and 'Product quality poor' at the bottom. A vertical line of seven dark grey dots descends from the top, ending in a dark blue downward-pointing arrowhead.

Growers & Industry

Product safety

A blue square containing the text 'Growers & Industry' at the top and 'Product safety' at the bottom. A vertical line of seven yellow dots descends from the top, ending in a yellow downward-pointing arrowhead.

Growers

Product confidence

An orange square containing the text 'Growers' at the top and 'Product confidence' at the bottom. A vertical line of seven white dots descends from the top, ending in a white downward-pointing arrowhead.



Era of **biology**

of IPM

BIOPESTICIDES



Thank you for your attention



RATIONALE
BIOPESTICIDE STRATEGISTS