

APRIL 2013

PGPR RHIZOBACTERIA

The term PGPR means "Plant Growth Promoting rhizobacteria" and refers to the natural rhizobacteria that colonize roots and contribute to the growth and health of plants. In exchange, plants supply carbon sources to PGPR through root exudates. This is a case of mutualism.

Many research groups are working on PGPR to elucidate their modes of action. Thanks to recent discoveries knowledge of their beneficial effects has expanded, particularly for the *Bacillus* genus. We now know that the *Bacillus* exert their actions on the growth and yield of plants by several modes of action. PGPR also produce molecules attacking pathogens or stimulating plant defence systems.



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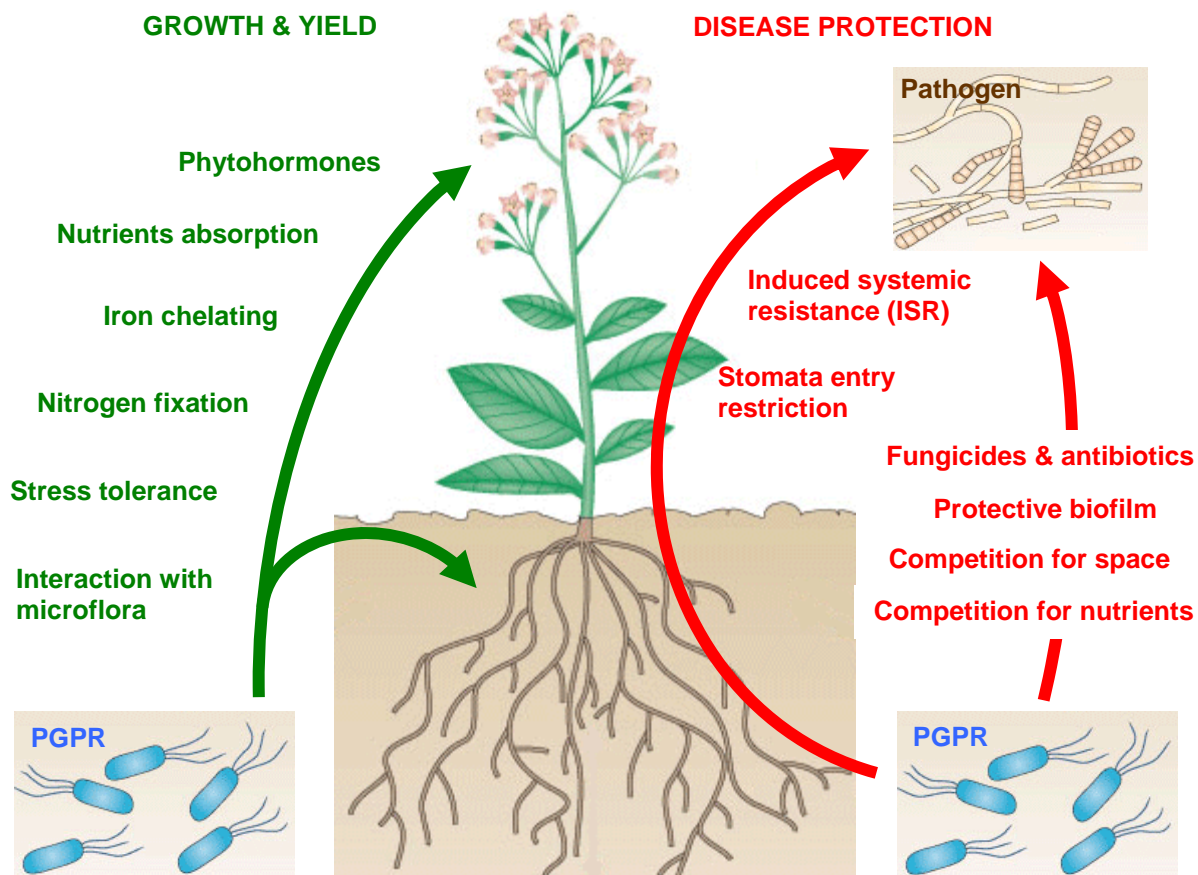
Rhizobacteria Mode of Action **P.1**

Field Assays. **P.2**

Activity on Yield **P.2**

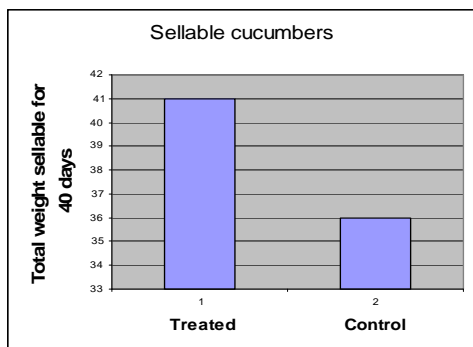
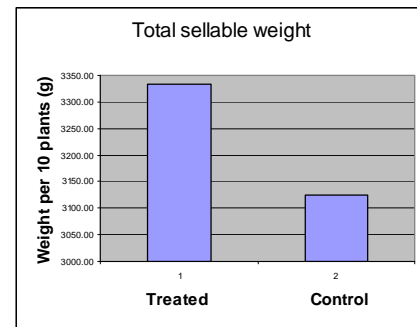
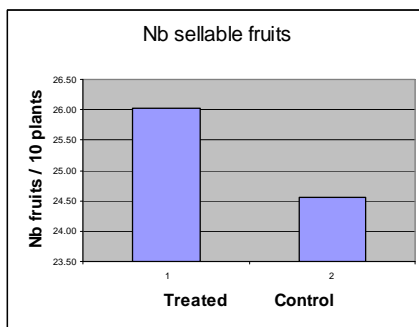
Protection Activity **P.3**

PGPR mechanisms of action

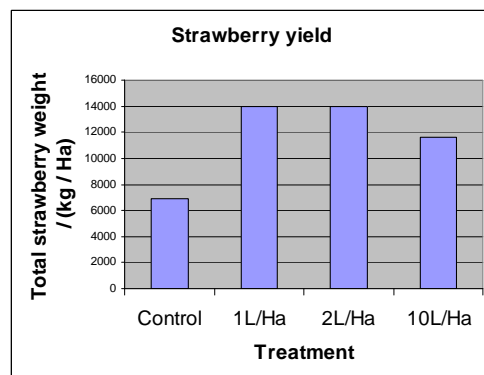


Activity of *Bacillus* sp. PGPR on yield

Tomato: Effect on tomato yield in soil (greenhouse organic culture) (treatments every 3 weeks, 2L / Ha). Measure on 13-17 weeks plants.

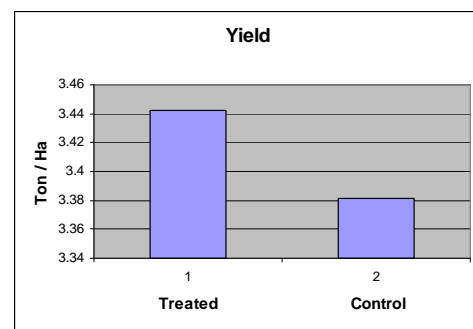
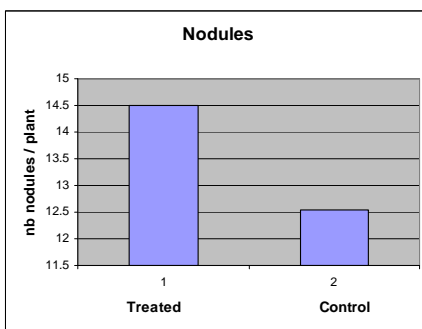
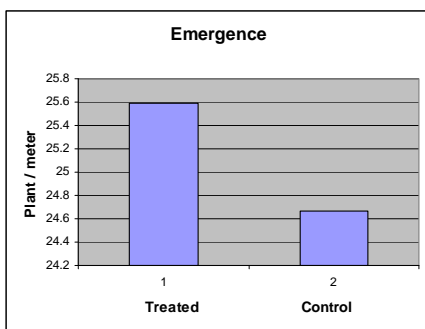


Cucumber: Effect on cucumber yield in coco (treatments every 3 weeks, 2L / Ha). Measure on 3-8 weeks plants.



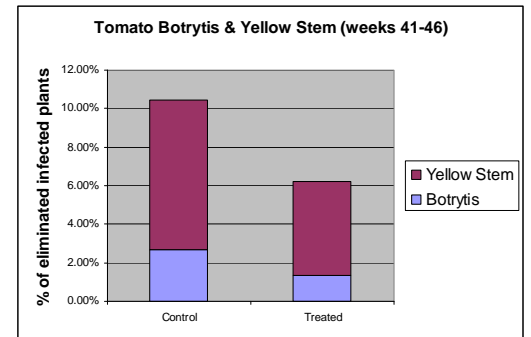
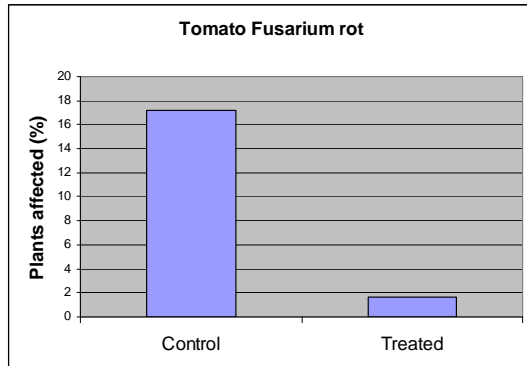
Strawberry: Effect on strawberry yield (plant soaking before planting followed by 7 drench/spraying every 14 days starting in June). Measure of sellable strawberries (6 pickings).

Soybean: Effect on soybean in field (seed treatment at 125ml /Ha + standard *Rhizobium* inoculant).



Protection activity of *Bacillus* sp. PGPR

Tomato: Protection of Botrytis and Yellow Stem in tomato plants in mineral wool (drench every 2 weeks, at the end of production (weeks 36-48), 2L / Ha). Measures represent the number of contaminated and eliminated plants during weeks 42-46 corresponding to the beginning of diseases in production



Tomato: Protection of *Fusarium* in tomato plants in mineral wool (Drench every 2 weeks,, 2L / Ha). Measures during disease outbreak.

Strawberry: Effect on strawberry (implantation) with verticillium wilt pressure (spraying every 15 days, T0= control, T1= 1 L / Ha, T2= 2 L / Ha et T3= 10L / Ha. Treatment in 3 blocks (Block 1 uncontaminated, Block 2 moderately contaminated, Block 3 highly contaminated). Effect on block 2: gray area means presence of disease.

Range	Bloc 2
1	T3
2	T3
3	T3
4	T3
5	T3
6	T2
7	T2
8	T2
9	T2
10	T2
11	T0
12	T0
13	T0
14	T0
15	T0
16	T1
17	T1
18	T1
19	T1
20	T1



Gerbera: Effect on gerbera powdery mildew (3 foliar and drench treatments 7-10d, observation at day 30).

