JABB SPE-120
BEAUVERIA BASSIANA
SOIL PLANT ENHANCER

LACKAWANNA PRODUCTS CORPORATION

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Soil Plant Enhancer- SPE 120

Soil and Plant Enhancer (SPE-120) with key ingredient Beauveria bassiana, is a natural, **Symbiotic Endophyte fungus** that lives in the **soil, roots, stems,** and **leaves**.

SPE-120 grows with the plant!

Beauveria Bassiana is a beneficial fungi normally found in soils but has been reduced due to production practices

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Beauveria bassiana (SPE120)
Endophyte/Symbiant

- Improves yield
- Environmental compatible
- Safe food
- Antagonist to plant pathogens
- Higher quality crop to market
- Saves $ - multiple functions
- Adapts with plant to stress

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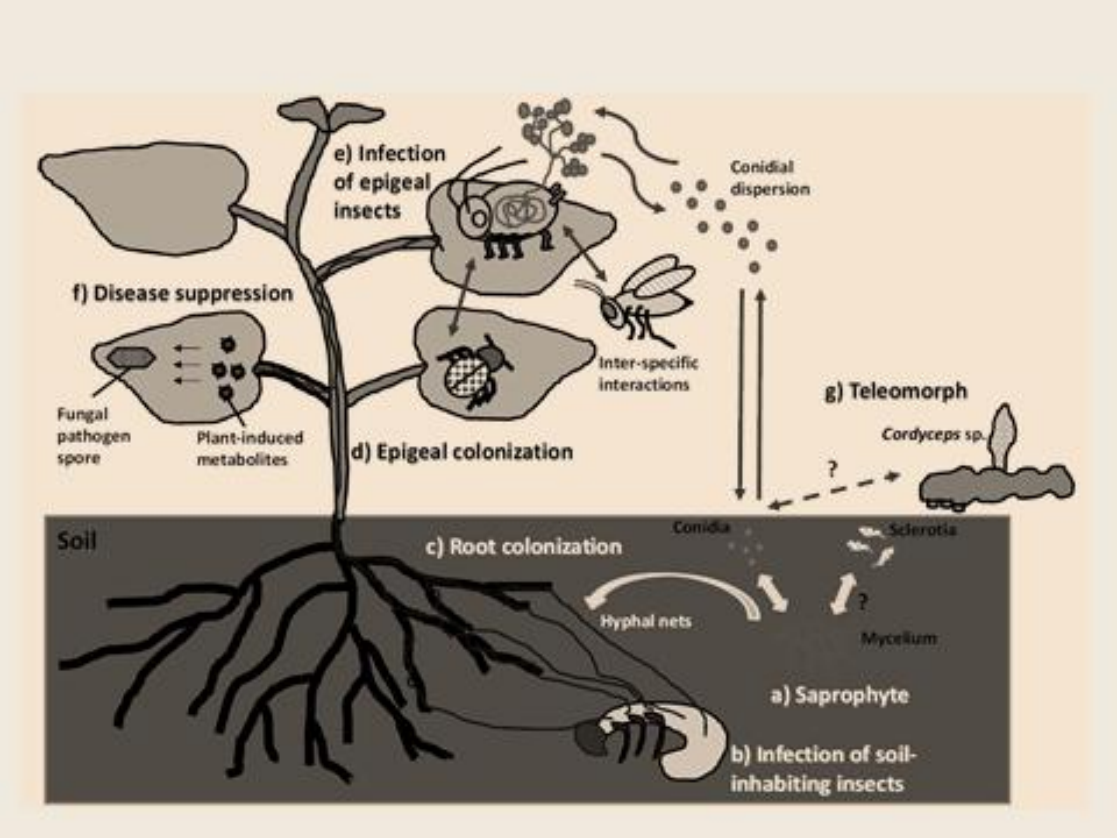
Bb colonizes the root of the plant and grows as a symbiotic endophyte throughout the plant



World J Microbiol Biotechnol (2016) 32:177

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Bb as an endophtye –Promotes Plant

SPE120 can be referred as a **Biostimulant** - which make plants more tolerant to various environmental stressors:

- Weather
- Temperatures
- Drought and/or flooding
- Inadequate soil conditions
- Herbivores (seed, root, stem, leaf feeders)
- Disease pathogens (viral, bacterial, fungal)

SPE120 enhances soil microorganisms for soil development.

Root growth aids nutrients uptake.

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SPE 120– Promotes Plant

- Bb has the ability to colonize a wide variety of plant species, both naturally and artificially following inoculation and confer protection against not only insects but plant pathogens. Jaber and Ownley (2017)
- Mechanisms of plant disease by endophytic fungi-
  - Direct suppression
  - Induction of systemic plant resistance
  - Promotion of plant growth Jaber and Ownley (2017)

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SPE 120 - endophtye – Promotes Plant

Beauveria Bassiana enhance growth of cultivated cotton and has the potential to protect the plants from insect herbivores and other stressors

(Rodrigues, et. al. 2009) D.C. Lopes, GAS word/Biological Control 89 (2015) 53-60

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SPE 120 - endophtye – Promotes Plant

In plant assays:

Protects from disease caused by soil born pathogens

Seed application of Beauveria bassiana 11-98 resulted in endophytic colonization of tomato and cotton seedlings and protection against plant pathogenic Rhizoctonia solani and Pythium myriotylum. Both patho- gens cause damping off of seedlings and root rot of older plants

(Ownley et. Al. J Invert Path,2008)

- Pythium-
- Rhizoctonia-
- Fusarium-
- Powdery Mildew (Ownley and Gwinn, 2009)

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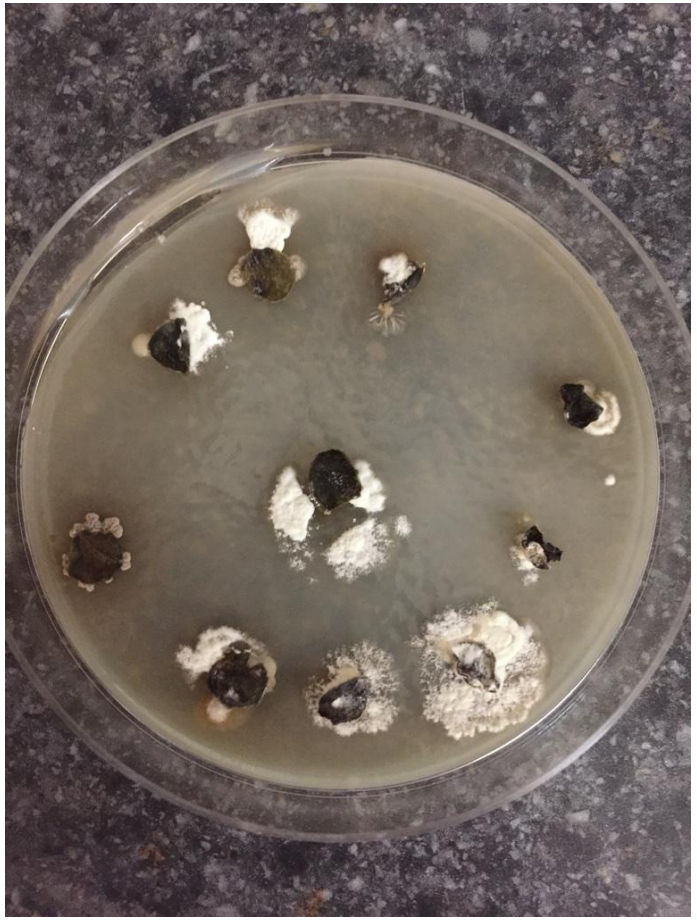
SPE 120 as an endophtye – Promotes and Protects Plant



Potato Leaf with Bb applied at plant growing from leaf 6 weeks post emergence.

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Bb as an endophtye – Promotes Plant Protection

- Report in Journal of Insect Science 2017 Pelizza et.al
- Found in corn colonized with bb vs untreated control:
  - Number of grasshopper eggs from insects feeding on treated corn – 17.7 eggs per female vs insects feeding on untreated corn – 27.2 eggs per female
  - 96% of control fed insects eggs embryonated vs 25% of eggs from females feeding on treated corn
  - Consumption of the corn leaf – Control insects consumed 25 mg in 15 days vs insects feeding on untreated corn 303 mg per insect.

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Soil Plant Enhancer- SPE-120
Better Soil, Better and Healthier Plants

- Beauveria is a natural part of soil microbes but has been significantly depressed by modern farm practices.
- SPE - 120 allows the augmentation of a naturally found soil microbe to be applied directly to the area of the soil that allow for maximum plant exposure and colonization of the root, stems and leaves of the plant as the plant grows.

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SPE – 120 Better Soil, Better Plants

- SPE – 120 has been used on:
  - Corn (field corn, seed corn, sweet corn, popcorn, specialty open pollinated corn)
  - Legumes (soybean, dry beans, alfalfa, lentils, chick peas, peanuts, clover, field peas, green peas)
  - Small grain (wheat, triticale, oats, barley, emmer
  - Onion
  - Strawberry and brambles
  - Tomatoes, Egg plant, Peppers
  - Cucurbits (squash, pumpkins, pickles, watermelon)
  - Crucifers (cabbage, broccoli, cauliflower, bok choy, brussels sprouts)
  - Potatoes, yams and sweet potatoes
  - Root Crops (radish, sugar beets, red beets, turnips, rutabagas, carrot)

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SPE – 120 Better Soil, Better Plants

Treated chick peas vs 2 untreated

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SPE – 120 Better Soil, Better Plants

Dry Beans Treated w/SPE 120. Untreated Dry Beans

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SPE – 120 Better Soil, Better Plants

- Formulation and use instructions
- SPE 120 should be applied:
  - Directly to seed as a seed treatment
  - applied with starter under the seed or on top of seed in seed trench
  - to roots via drip irrigation
- Liquid
  - Use 1 ounce per Acre of seed
- Dry
  - Graphite+talc carrier, use 2 ounces per acre

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SPE – 120 Better Soil, Better Plants

- Contact your SPE distributor for pricing
- References on cited scientific literature available on request
- Jabb of the Carolinas
- WWW.Jabbspe.com

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- **Soil and Plant Enhancer – SPE 120 with lubricant**
- Plant enhancer contains a beneficial microbial that forms an essential symbiotic relationship enhancing plants and soil to enhance soils and plants. Active Ingredient Beauveria bassiana 1 % (5.6x103cfu/ml)
- 1 acre treatment of Beauveria bassiana in 2ounces of 80/20 seed lubricant (mineral talc and graphite) Beauveria bassaiana is beneficial fungi related to mycoorizal fungi and Trichoderma. Specifically, mycoorizal is a symbiotic route to the root hairs
- Trichoderma is symbiotic transfer for leaves and roots
- Beauveria bassiana is a symbiont for the roots, stems and leaves and is translocated by the zylum and phloem Research report all these beneficial fungi have varying forms of protections to the soil and plant
  Apply 2 ounces per acre directly to seed, in seed box or metered.
- **NOTE: store in a facility that is below 90 f**
- Product of Jabb of the Carolinas
  302 E Brown St., Pine Level, NC 27568 www.jabbspe.com

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- **Soil and Plant Enhancer – SPE 120- ES**
- For Organic Crop Production as a beneficial microbial for enhancement of soils and plants Active Ingredient Beauveria bassiana min of (5.6x103cfu/ml) 1%
- Ingredients organic soy oil, Organic adjuvant, 99% total 100% Beauveria bassaiana is beneficial fungi related to mycoorizal fungi and Trichoderma. Specifically, mycoorizal is a symbiotic route to the root hairs
- Trichoderma is symbiotic transfer for leaves and roots
- Beauveria bassiana is a symbiont for the roots, stems and leaves and is translocated by the zylum and phloem Research report all these beneficial fungi have varying forms of protections to the soil and plant
- **Directions for use 1 ounce concentrate per acre. Apply directly to seeds, in soil trench and foliar sprayed to enhance plant, leaf and stem health**

- **SHAKE WELL PRIOR TO USE. LOT 030318, EXPIRES MAR 2021 NOTE: store in a facility that is below 90 f**
- Product of Jabb of the Carolinas
  302 E Brown St., Pine Level, NC 27568
- www.jabbspe.com
- Beauveria bassiana is a beneficial fungi commonly found in soils and plants. Initially referred as an entophyte of the plant, it quickly establishes itself as a symbiont sharing survival benefits with the plant. Beauveria bassiana colonies grow with the plant roots, stems, and leaves. As an active partner for the wellness of the plant Beauveria b. provides stimulation increasing chlorophyll in leaves. This provides sun screening shelter for the Beauveria b. as well as increased photosynthesis. Together, the plant and Beauveria b. partnership strengthens survival resilience assuring a bountiful harvest. Beauveria b. joins other known microorganisms beneficial to soils and crops. In addition to plant health it does not harm beneficial insects like pollinators and non-herbivores.
- This product should not be used as a pesticide. SPE120 strains were selected for plant symbiosis and have been cultured from nature. Strains have not been genetically altered.

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