

# *Companion*



*American Hydroponics*



™

Growth Products' Companion™ contains beneficial *Bacillus subtilis* GB03, a naturally occurring bacteria that colonizes and lives on plant roots and root hairs.



*Bacillus subtilis* GB03 is gram-positive (spore producing), a fact that means it is extremely persistent and able to withstand stressful conditions like heat, drought, and cold. Companion's non-clogging, non-abrasive liquid formulation also includes a food source to ensure the survival of the GB03 once they are applied.

Companion™ is 100% natural, and contains no chemicals. What does this mean for you and your plants? Well, to start with, you'll get some secondary benefits that you wouldn't when using chemicals. For instance, it is a known fact the use of chemical products will actually prune the roots of your plants. In stark contrast to chemical fungicides, Companion™ actually encourages stronger, denser root mass and length! *Bacillus subtilis* GB03 excretes auxin-like substances which encourage such growth.

Companion™ is also a valuable tool for resistance management. Why? A naturally occurring beneficial like *Bacillus subtilis* GB03 will crowd out less desirable microbes, in what amounts to a game of "survival of the fittest". GB03 quickly adapts to its environment, and reproduces more quickly than other microbes. Additionally, they also establish colonies that make it difficult for detrimental microbes to gain a foothold. This process may be likened to a crowded parking lot ... once all of the spaces are filled, there aren't any spaces for new microbes.

*Some frequently asked questions:*

Q. How do *Bacillus subtilis* GB03 survive?

A. If conditions are unfavorable, the *Bacillus subtilis* do not die, but rather form spores (go into dormancy). They re-emerge when favorable conditions are re-established.

Q. Under what conditions are *Bacillus subtilis* most active?

A. *Bacillus subtilis* are active in temperatures between 45 and 113 degrees Fahrenheit.

Q. Where do *Bacillus subtilis* live once they are applied?

A. *Bacillus subtilis* GB03 bacteria establish colonies around the root hairs of the plant.

Q. What do *Bacillus subtilis* eat?

A. The main food sources for *Bacillus subtilis* are 1) the sugars being released by the plant roots and 2) carbon from dead root cells.

Q. Is it true that *Bacillus subtilis* improves the root system of the plant?

A. Yes. By cleaning up old and dead roots, the *Bacillus subtilis* actually function as root "cleaners." They also produce hormones that have been shown to increase root branching, mass, and length.

Q. What other benefits does *Bacillus subtilis* GB03 provide to the plant?

A. You'll have stronger, healthier plants ("from the root up"). Plants with a healthier root system are better able to take up and use nutrients.

Q. What effects does *Bacillus subtilis* GB03 have on nutrients?

A. *Bacillus subtilis* GB03 produce enzymes that help free up minor elements in the nutrients, making them available for plant uptake.

Q. Can Companion™ be applied through irrigation systems?

A. Yes. Companion™ can be applied without fear of clogging through even the most sensitive irrigation equipment.

Q. Is Companion™ compatible with nutrients and additives?

A. Yes. Companion™ may be tank mixed with almost all other nutrients and additives.

Q. What is the shelf life of Companion™?

A. More than four years, thanks to a special patented formula.

