



PlantShield

Introduction to PlantShield

Fungi and insects are some of the most common pests that attack plants. As a result, plants have evolved the ability to detect the presence of insects and fungi as part of their natural defense strategies. Plants use special receptors on the surfaces of their leaves to detect the exoskeletons of insects and the cell walls of fungi.

Oligochitosan are miniscule pieces of exoskeleton. That is why plants recognize the presence of Oligochitosan molecules as a pathogen attack, which triggers a series of defensive responses and induces beneficial changes within the plant.

It is important to note insect and fungi exoskeletons are made of a different form of chitin – not Oligochitosan. Most forms of chitin are not soluble in water, thus it has low bioactivity and is impossible to formulate into a liquid. To resolve this issue, we apply our proprietary manufacturing process to modify the chitin in order to obtain plant available Oligochitosan molecules, which are far more effective at triggering a reaction within the plant. Our unique production process allows us to create Oligochitosan, the most bioactive chitin-derived molecule possible.

Plant Effectors

A plant effector is usually a small molecule, one that can be beneficial for a plant by inducing or changing certain behaviors. When effector molecules bind to specific receptors within a plant, they can regulate the plant's biological activity. This can lead to an increase in enzyme activity, specific gene expression, and cell signaling.

We use two powerful plant effectors in order to trigger a number of beneficial changes:

- Increasing the plant's tolerance to abiotic stresses such as salt, heat and drought
- Increasing photosynthetic activity
- A versatile biopolymer that is nontoxic and biodegradable
- Triggering flowering and fruit yield
- Inducing the bioaccumulation of plant defense compounds
- Development of physical defense structures such as thicker cell wall development
- Acts as a slow release fertilizer to improve soil structure

These two highly bioactive plant effectors trigger two separate pathways within the plant. Since our unique approach has allowed us to create a product of incomparable effectiveness, it only needs to be applied once every two or three weeks to achieve amazing results. Therefore, growers can produce superior crops by using a very small amount. This product is compatible with all growing media and all base nutrients. It can be applied as a foliar spray, or watered directly into the root zone.

The first application is recommended one week before transition to flower, and then applied once every two or three weeks after the flowering stage. For best results, we recommend foliar spraying the first two applications, followed by watering into the root zone once every three to four weeks until harvest.

Citric Acid is another well-known plant effector, but plants do not register it in the same manner as Oligochitosan. Citric Acid skips the first steps of the reaction as it does not need to bind to a receptor in order to trigger a cascade reaction. Citric Acid is the first step in the molecular chain reaction, a very small quantity will activate a plant's defense response.

Importantly, Citric Acid does not work on the same pathway as Oligochitosan, which means their effects complement rather than oppose one another which therefore induces the formation of many desirable compounds that give rise to a rich complexity in plants leading to higher quality crops.

PlantShield has been carefully formulated using the latest scientific understanding of plant biology to trigger dramatic plant responses. By incorporating **PlantShield** into any growing program, cultivators are able to switch on two separate and complementary plant defense pathways. This sets off a cascade response within the plant and leads to a wide variety of beneficial physiological responses, allowing growers everywhere to achieve amazing results with as little as three or four applications.

Application Rates for PlantShield

These application rates are considered a starting point or minimum needed to see Defense benefits on crops. Under certain conditions higher application rates are optimal.

Defense can be applied throughout the entire growth cycle (seed to harvest).

Beginning applications earlier in growth cycles is known to further maximize Defense's benefits.

Application Rate, Timing/Frequency - Drench Applications

Tomatoes

200 mL/acre (6.5 fl. oz. in approx. 30 to 40 gals of water) – apply every 3 weeks after sowing or transplanting.

Corn, Peanuts

240 mL/acre (8 fl. oz. in approx. 40 gals of water) - 2 applications at V2 and V4 growth stages.

Potatoes

200 mL/acre (6.5 fl. oz. in approx. 30 gals of water) - apply every 2 weeks after sowing.

Field Vegetables

240 mL/acre (8 fl. oz. in approx. 40 gals of water) - apply every 2 to 3 weeks after planting.

Wheat, Canola, Soy, Beans

300 mL/acre (10 fl. oz. in approx. 40 gals of water) - one application at seeding and again at the 3-5 leaf stage.

Flowers

150 mL/acre (5 fl. oz. in approx. 40 gals of water) - apply to plants weekly.

Fruits

150 mL/acre (5 fl. oz. in approx. 40 gals of water) - spray every other week for first four treatments, then once monthly.

Greenhouse Vegetables

200 mL/acre (6.5 fl. oz. in approx. 30 gals of water) - spray every 2-3 weeks after sowing or transplanting.

Trees, Shrubs

180 mL/acre (6 oz. in approx. 40 gals of water) - spray root zone and leaves once monthly.*

*Use more or less product depending on type of tree or shrub and height.

Application Rate, Timing/Frequency - Other

Hydroponics, Hemp, Marijuana

2 mL per L of water (1 fl. oz. per 4 gals. of water) apply to roots weekly through grow and bloom, beginning at transplant.

Soil, Compost

1 ml. per Kg. of soil (1 fl. oz. per 65 lb. of soil) apply to soil and mix thoroughly.

Seed Coating

10 mL per 15 Kg. of seed (1 fl. oz. per 100 lb. of seeds) apply directly to seeds with enough water for coverage.

Contents

Citric Acid, Oligochitosan (derived from marine chitin), trace amount of acetic acid