

Turf FAQs

TurfShield[®] PLUS⁺ | BotaniGard[®] | Molt X[®] | VitalSource[®] | ON-Gard[®]

1. TurfShield PLUS⁺

○ How is it different from the original TurfShield?

The original TurfShield introduced in the late '90s consisted of two products: TurfShield Granules and TurfMate Turf Plant Inoculant. TurfShield Granules consisted of only *Trichoderma harzianum* strain T-22, whereas TurfShield PLUS⁺ Granules contains T-22 plus *Trichoderma virens* strain G-41. The granular formulations are otherwise similar. TurfMate was a clay-based wettable powder formulation with only T-22. TurfShield PLUS⁺ WP contains the active ingredients T-22 and G-41. Additionally, an important difference is that TurfShield PLUS⁺ WP uses a water soluble carrier and is much easier on equipment and easier to apply.

○ Will my standard chemistries kill off the beneficial fungi in TurfShield PLUS⁺?

There are two primary areas where standard chemistries will contact TurfShield PLUS⁺. The first is in the spray tank if tank-mixed. TurfShield PLUS⁺ WP will tolerate a number of insecticides and fungicides in the spray tank. See the BioWorks TurfShield Compatibility Chart for more information. The second area where standard chemistries would contact TurfShield PLUS⁺ is on the turf. Once established, there are few concerns with applying standard chemistries over the top of TurfShield PLUS⁺ WP or Granules.

○ How does TurfShield PLUS⁺ fit into a program?

Depending on the existing program, TurfShield PLUS⁺ can replace one or more inputs. Some superintendents have found a significant reduction in total inputs is possible when TurfShield PLUS⁺ is part of the turf management program.

TurfShield PLUS⁺ works well with monthly wetting agent applications along with liquid nutrient inputs.

○ How well does TurfShield PLUS⁺ work on leaf diseases?

TurfShield PLUS⁺ is a root colonizer. It protects turf roots from damaging pathogens. Some foliar diseases which originate in the soil are controlled by the application of TurfShield PLUS⁺. Increasing the overall health of the roots results in a stronger plant better able to withstand low to moderate infections.

○ Should we apply only during aeration to get down into the aeration holes?

No, application does not need to wait until an aeration event. TurfShield PLUS⁺ active ingredients once applied will grow onto turf root systems.



- **Need to water in?**
Yes, TurfShield applications per the label require watering-in to drive the active ingredients into the root zone.
- **Dollar spot is not a root disease. How does it control that pathogen?**
TurfShield *PLUS*⁺ works to reduce disease pressure by reducing the inoculum levels in the soil that can move to the turf foliage.
- **Will thatch affect performance?**
No.
- **Is it ok to apply TurfShield *PLUS*⁺ with my monthly wetting agent application?**
Yes, TurfShield *PLUS*⁺ is compatible with wetting agents when mixed and applied immediately.
- **How does TurfShield *PLUS*⁺ work to improve root development?**
TurfShield *PLUS*⁺ primarily protects the roots from pathogen attack, thus allowing the root system to expand to its full potential.
- **How does TurfShield *PLUS*⁺ solubilize micronutrients? Which ones?**
TurfShield *PLUS*⁺ solubilizes phosphates and the micronutrients manganese, iron and zinc. It does this by the release of organic acids, the synthesis of reducing metabolites and the production of chelating substances.
- **What do the TurfShield *PLUS*⁺ active ingredients feed upon in the soil?**
As plant roots grow through soil they release exudates containing water soluble compounds such as amino acids, carbohydrates, sugars, vitamins, mucilage, proteins and organic acids that supply food for microorganisms. TurfShield uses these materials to rapidly proliferate along the root as it grows and colonizes and populates in soil immediately surrounding the plant roots. This fast and extensive establishment of TurfShield active ingredients provides greater and more complete interaction with and protection of plant roots.
- **Do fertilization programs enhance / hinder / no effect on beneficial fungi development?**
Fertilization programs basically do not affect beneficial fungi development. Optimum fertility allows the maximum expansion of root systems and therefore more roots for TurfShield *PLUS*⁺ on which to grow.



2. BotaniGard

○ How does it work? (Mode of Action)

The applied spores infect directly through the outside of the insect's cuticle (the skin). Spores adhering to the host will germinate and produce enzymes that attack and dissolve the cuticle, allowing it to penetrate and grow into the insect's body. As the insect dies, it can change color to pink or brown, and eventually the entire body cavity is filled with fungal mass. The most common visible indication of insect death is a discoloration of the larvae nymphs. It is not necessary for a white fungal growth to occur to know the product is working; the insect is killed before this happens.

○ Can we tank mix with standard chemistries?

Yes, BotaniGard can be mixed with many standard insecticides and fungicides. See our BotaniGard Tank Mix Compatibility sheet for more information.

○ How long does it take to work?

BotaniGard takes from 3 – 5 days to kill the insects. However, insects will stop feeding soon after becoming infected with *Beauveria bassiana* strain GHA.

○ How long does it last in the turf?

No more than a few days. BotaniGard should be treated as a contact insecticide. It must make contact with the insect to be effective.

○ Are multiple applications needed?

Multiple applications (2-3 separated by 7-10 days) are recommended for the fast-reproducing insects (aphids, chinch bugs) and 1-2 for the other targets or as needed until populations diminish.

3. Molt X

○ What is the Molt-X mode of action?

Molt-X has multiple modes of action which include:

- Primarily as an Insect Growth Regulator (IGR) that disrupts the molting process in insects. Insects treated with Molt-X become sluggish, stop feeding, and fail to mature and reproduce.
- Insect repellent
- Antifeedant
- Oviposition deterrent

These multiple modes of action make it a highly effective tool for use in a resistance management program.

○ What is the formulation of Molt-X?

Molt-X is an emulsifiable concentrate liquid formulation.

○ Isn't Molt-X just neem oil?

No. Neem oil contains none to very little azadirachtin. Unlike Molt-X, neem oil's mode of action is suffocation.



- **What pests does Molt-X kill?**

Molt-X controls a wide variety of immature insects including:

- Caterpillars, beetles, weevils, mole crickets
- True bugs, leafhoppers, leafminers, leafrollers
- Psyllids, sawflies, webworms
- Mealybugs, cutworms

- **Can Molt-X be tank mixed?**

Yes, with a wide variety of inputs. It is recommended to do a jar test to determine physical compatibility.

4. VitalSource®

- **Are all VitalSource products organic?**

All VitalSource products contain organic ingredients, but not all are certified organic.

- **How is VitalSource different from poultry manure base products?**

VitalSource products are manufactured from discrete organic, and in some products, mineral sources that have been characterized for release characteristics and made into a MINIGRAN granule. This unique formulation delivers user-friendly, low odor, low dust, microgranules that contain uniform nutrient content for better controlled nutrient delivery. Because the release of nutrients matches the demand of the plant for up to three months, there is little to no leaching into the environment.

- **How is VitalSource different from biosolid based products?**

VitalSource products do not use any biosolid ingredients. Also, all of the ingredients are traceable, made from food-grade ingredients, pathogen-free, and low in heavy metals.

- **What can I expect as far as color response? At what rates?**

Color response depends upon many factors like: grass type, soil moisture and temperature. With VitalSource 8-0-8, we have experienced a color improvement 10 days after application lasting over 60 days.

- **How does the plant meal content affect release characteristics?**

The plant meal content is only part of the overall ingredients. It is carefully blended with the other ingredients to provide the desired release.

- **Does the homogeneous composition affect performance of the fertilizer?**

A homogeneous fertilizer delivers the same level of nutrients in every location where it makes contact in the turf.

- **How fast does the particle breakdown?**

The particle will not crumble as this would provide a dusty product. The particle sizes allow penetration into the turf canopy and breakdown over time through microbial activity.



- **How many weeks does it last?**
The VitalSource products are designed to release 60+ days depending upon the slow release content.
- **How will temperature affect release rate?**
VitalSource release depends on microbial activity. Under either cold (less than 40°F) or hot (greater than 90 °F) temperatures, microbial activity is slowed and therefore release is slowed. However, VitalSource products generally will release under lower cooler temperatures than a coated fertilizer. Also, they will not dump nutrients excessively in very hot weather.

5. ON-Gard

- **What is a plant protein hydrolysate?**
The plant protein hydrolysate in ON-Gard is a mixture of amino acids obtained by the hydrolysis (splitting with enzymes) of a plant protein. The production of plant protein hydrolysate used for ON-Gard utilizes a proprietary process named Lisiveg®.
- **How are plant and animal protein sources different?**
They are different in several ways. Animal protein hydrolysates are produced using chemical hydrolysis with acids or alkali materials. They also contain fewer favorable amino acids.
- **There are many other products claiming to be 100% plant based containing L – amino acids. How is this proven?**
 - An aminogram is a test that shows levels of all amino acids in ON-Gard and other products containing amino acids.
 - Are these free amino acids?
 - No, not all. The total amino acid content of ON-Gard is 30 – 35%. Of this, there are around 3 – 4 % free amino acids.
- **Do L-amino Acids have chelating properties?**
 - Yes.
- **Are all amino acids beneficial?**
 - No. While all amino acids are necessary, an excess of some is undesirable. For example, in animal-derived amino acids, there are higher levels of glycine and proline, no tryptophan and they contain hydroxyproline and hydroxylysine. The presence of the two latter amino acids is an indicator of animal derived amino acids.
- **Is urea added to help move ON-Gard through in foliar applications?**
 - No. Urea is not needed to move ON-Gard through the leaf cuticle. The amino acids are readily absorbed into plant tissue. The nitrogen content of ON-Gard comes from the plant protein hydrolysate.



- **Why would I need this product?**
ON-Gard helps turf resist stresses that make it go off-color or increase susceptibility to disease. ON-Gard can also increase the effectiveness of herbicides and fungicides when tank mixed.
- **What is the best application schedule to benefit the turf?**
During scheduled fungicide and/or herbicide applications.
Several applications (14 day interval) prior to high air and soil temperatures.
- **Can it be tanked mixed with herbicides, fungicides, fertilizers?**
Yes. ON-Gard has been shown to increase the efficacy of applied herbicides and fungicides.
- **Can I expect any growth response?**
In some cases, a growth response is seen, but in many instances improvement in foliar color and resistance to stress are more common.

Please refer to product labels for complete application details. Additional technical information is available from either our website: www.bioworksinc.com, or your BioWorks sales representative. Always read and follow label directions.