

## Online Extras

### Understanding and Using Trichoderma Fungi

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When shopping for Trichoderma fungi, the following tips will ensure you get the best product quickly and easily.

1. Look for stable formulations. Over the years the packaging and use of beneficial micro-organisms has become easier to use and more convenient. Many products now come as powders or liquids. Do not buy products that require refrigeration or special handling. Refrigerated products may have been allowed to get warm and be reduced in effectiveness long before you receive them. Stable products come in liquid or granular formulations.
2. Look for combinations of Trichoderma species in one product. A mixture will often give protection against more pathogens than a single Trichoderma species. Or, a combination of species can attack different points in the lifecycle of a pathogen. For example, Trichoderma koningii inhibits the mycelial growth of Rhizoctonia solani by 79 per cent. Trichoderma harzianum reduces the spore viability of Rhizoctonia solani by 82 per cent (Melo and Faull 2002). Combining these two species creates a powerful double action product to control Rhizoctonia. Also several species of Trichoderma may be combined to give longer season control because where one species starts to lose effectiveness the other may extend the protection.
3. Look for a guaranteed analysis on the label. These numbers will give you the number of spores or Colony Forming Units (CFUs) in the product. CFUs are a relatively new unit of measure to describe not only spores but mycelium fragments that can also initiate fungal colonies. The higher the number the more fungal “seeds” you have to inoculate your plant roots.
4. Shelf life is important. It does you no good to have a large amount of spores at the time of manufacture only to have nothing but water to apply when you are ready to use the product. A long shelf life ensures the product is alive and active when you need it. A typical shelf life would be 18 months but products with a shelf life of 24 months are becoming more commonplace.
5. Do your homework and see how long the product has been on the market. Reputable companies have been selling the product for many years and have a track record.
6. Look for products that operate over a wide range of temperatures. Trichoderma fungi, like any living organism, slow down or die in extreme temperatures. The temperature range in which the product is effective gives you an indication of how hardy the Trichoderma strains are. Often manufacturers will mix Trichoderma that have different points of temperature inactivation due to high or low temperatures, again to extend protection time.
7. Make sure the Trichoderma product is organically certified. This ensures that the product does not contain any harmful human pathogens, genetically modified organisms or synthetically produced ingredients.

High Quality Trichoderma Product	Low Quality Trichoderma Product
Liquid or granular formulation	Refrigerated product
Mixture of Trichoderma species	Single species product
High CFU or spore count	Low CFU or spore count
Long shelf life – 18 months minimum	Short shelf life
Reputable manufacturer	Questionable source
Active over wide temperature range	Active over narrow temperature range
Organic certification	Not organically certified