



## *What to consider when using biological products?*

The world of biological products can be a confusing place with unique active names, strains, product concentrations, unusual and varied modes of action, special storage requirements and use recommendations.

### *How do we know we have the right product or the best product for the job at hand, and are we using and storing it correctly?*

When making a decision to purchase a biological product, the first consideration is to review the product label. You should note the following:

1. Does the product have an appropriate registration number? The purpose of a registration lets you know the manufacturer has met the required standards and the product is legal. If it does not have a registration number, steer clear. Even biological products need to be registered.
2. Review the claim on the label. This is where the manufacturer has to state the purpose of the product and would have had to have proof that it did what it says in order to get the registration. Does the claim match the use you require, either as an inoculant or a disease or pest suppression product? Does it match what the salesman is trying to sell it to you for? If so proceed, if not you may need to ask further questions and make your own judgement call.
3. Check the concentration of the product, this will help you compare the product with others you may have looked at. If it is a bacterial or fungal based product the concentration will be referred to as a long number that looks like an equation. For example  $1 \times 10^9$ . The number 9 refers to the number of zeros that would be placed after the first number if it were written as a full number. In this case  $1 \times 10^9$  would be 1 000 000 000 or 1 billion. It is important to note that what can look like a small difference is actually a very big difference in real terms. If you were comparing a  $1 \times 10^9$  product to a  $1 \times 10^8$  the latter is a product 10x weaker in terms of concentration and likely produced by an inferior manufacturer.
4. In addition to concentration, another factor to consider is viability of the spores in the product. Like buying a bag of seed, some seeds will germinate and produce a plant and others won't. If it is a good bag of seed you will get good bang for your buck. How do you make sure a product has good viability though if you can't see it growing? For a start make sure you are buying from a reputable supplier, both manufacturer and agent. Do you trust them? Does the product look professional and again, is it registered? Part of the registration is to confirm the product meets quality and shelf life expectations. Ask questions about how the product has been stored as this can seriously impact viability. Check the expiry date.

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5. Every product is different, because they contain different strains of the same organism. This means they are very similar but may have slight differences in terms of efficacy. For example you may have bought one Trichoderma product that gave very good root growth enhancement and then tried another that gave better disease suppression, and another that gave no result at all. You can't say that, because you have tried one Trichoderma product which gave you a poor result, a different one will not perform better.

***Once you have checked the above and have decided to purchase a product, what precautions should you take to ensure you get the best from that product?***

1. When you receive your order, check the packaging for an expiry date and storage requirements. If the product is stored correctly on your farm it will still give good efficacy until the expiry date is reached. Ensure you use it before that time and store it as the manufacturer recommends. Some products can be stored in a cool dry place, others may need to be refrigerated. In all cases, direct sunlight or very warm storage conditions would be detrimental to the shelf life of the product.
2. In addition you should check with your supplier to ensure they have taken precautions during storage and handling to ensure the product is in good condition on delivery to you. Most biologicals can withstand short term temperature changes, such as those that may be experienced in transit however precautions should still be taken to limit these effects particularly in hot climates. The supplier must also have appropriate facilities at their warehouse to store the products in the medium to long term.
3. When in field using the product, try to keep it cool and out of the sun. Direct UV light from the sun can affect the product prior to application as well as after. For this reason, if it is possible, try to apply the product in the early morning or late afternoon.
4. Ensure you read the label and follow the recommended application practice. Ensure the worker in the field is also familiar with the label recommendation.
5. Check compatibility; as many agrochemicals are designed to kill fungal or bacterial diseases, they may also harm your product which contains beneficial fungi and bacteria. Before applying in a tank mix check with the supplier if it is ok. If not, you may need to apply separately and on a different day.

***Once you have applied your product what can you expect?***

1. Prevention is better than cure, when it comes to biologicals most are more effective in preventative or low pressure scenarios. Do not wait for a pest or disease to get out of hand before taking corrective measures. Rather apply when you first notice the problem.
2. It is important to note that a biological product takes longer to achieve the result of a chemical. You cannot walk into your field the next day and expect all the disease or pest to be gone. Give the product 3-4 days to work. If the product is an inoculant and has an effect on roots, pull a plant to check its roots are bigger. In the case of a legume inoculant root nodules should appear close to the base of the stem and if they are active they will be light pink in colour when cut open.
3. For disease or pest suppression you will likely need to re-apply at least once. Follow the label; if it recommends a minimum of three applications, complete three applications before assessing whether or not the product was effective.
4. Discuss your expectations with the sales person to ensure you know what to expect from the product. Remember, biologicals are not a silver bullet or a quick fix.

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