MYCONATE® Mycorrhizal Stimulant

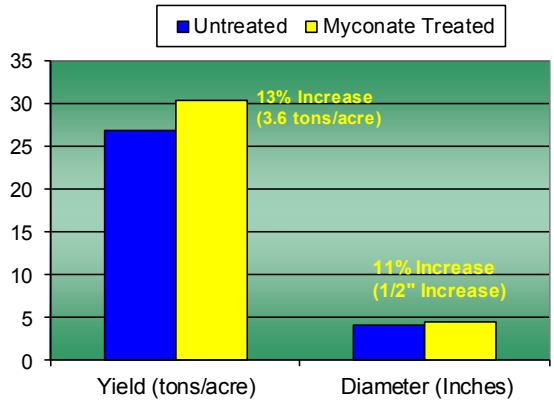
Onions

Usage Tip Sheet

How Myconate Works

Myconate contains the biologically active isoflavone "formononetin," which is a natural signaling compound found in most plants. This signaling compound increases the rate and extent of VAM (Vesicular- Arbuscular Mycorrhizal) fungi colonization, spore germination, growth direction and the rate of VAM growth are affected. Simply put it helps the native mycorrhizae find and colonize onion roots more quickly for a quicker start

In a grower trial on muck soils, Myconate increased onion diameter by ½" and yields by 13% (3.6 tons per acre).



SEED TREATMENT AT PLANTING

- TIMING: Apply to seed in planter box at planting.
- RATE: Use 1.25 dry oz of Myconate HB per acre's worth of seed.
- MIXING: Myconate can be premixed with planter lubricants such as talc or graphite.
- APPLICATION: Spread the powder over the seeds and stir the seed to spread it throughout the seed mass.

IN-FURROW APPLICATION

- TIMING: Single application made at planting.
- RATE: Use 2.5 fluid oz of Myconate AS per acre.
- MIXING: Shake jug thoroughly before using. Myconate may be mixed with many other crop production products – consult your PHC rep for specific details.
- APPLICATION: Apply within 1 inch of seed placement, preferably closer. Keep mix well agitated.

TRANSPLANTED ONIONS

- TIMING: Apply within 1 week of transplanting.
- RATE: Use 2.5 fluid oz of Myconate AS per acre's worth of transplants.
- MIXING: Shake jug thoroughly before using. Add to the required volume of water and maintain agitation.
- APPLICATION: Apply uniformly over the transplant flats. Keep mix well agitated during application. Water flats after application to incorporate the Myconate into the root zone, using ¼ - ½ inch of water.

USER SAFETY RECOMMENDATIONS

Please refer to Myconate product labels.

GENERAL USE CONSIDERATIONS:

- Myconate performance is unaffected by fungicide on the seed.
- Myconate does not reduce germination or plant stand.
- Myconate performs well on metam or Telone fumigated ground as VAM spores remain.
- Cole crops (cabbage, mustard, etc) and beets do not support mycorrhizal fungi, and will not benefit from Myconate.
- Keep container tightly closed and store in a cool, dry location.
- Shake liquid products well before using.

Always read and follow label instructions before using this product.

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The Science Behind Myconate®

PRODUCT OVERVIEW: PHC Myconate®

- Contains a naturally occurring isoflavone called **formononetin**, a signaling molecule released by plant roots to trigger mycorrhizal spore germination and speed the development of mycorrhizal roots of your crop plants.
- Increases growth and colonization of roots by beneficial **vesicular-arbuscular mycorrhizal (VAM)** fungi. See example to right center.
- **Increases the ability of plants to absorb water and nutrients by increasing the effective absorbing surface area of root systems.** Consequently, your crop is able to exploit more soil.
- Application of Myconate® at planting time or at the early stages of root development of your crop stimulates VAM development sooner than would occur otherwise providing **increased yield potential and enhanced tolerance to soil and climate stress factors** which may arise at any stage of the season.
- **Numerous field trials have shown that Myconate® increases yields of most agricultural crops.**

VESICULAR-ARBUSCULAR MYCORRHIZAE (VAM):

- Presence of VAM fungi in crop roots benefits plant nutrition and growth as well as tolerance to soil, climatic and other environmental stress factors thereby enhancing crop yields.
- VAM are known to unlock unavailable phosphorus.
- In greenhouse trials, corn plants grown from seed treated with Myconate®, had twice the amount of roots colonized by VAM than did plants from untreated seed, in just 8 weeks after planting.
- In pepper plants treated with arbuscular mycorrhizal fungi, Texas A&M research documented increased chlorophyll, photosynthesis, and faster drought recovery.

RESEARCH FINDINGS:

The beneficial effects of VAM are known to result from one or several of these mechanisms[1]:

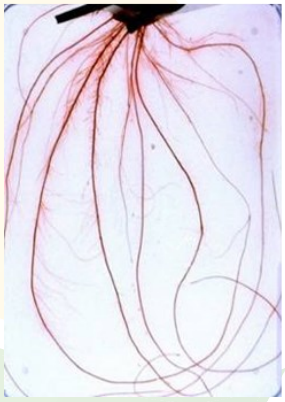
- Increased overall **absorption capacity** of roots due to morphological and physiological changes in the plant. There is increased absorption surface area, greater soil area explored (because the fungi act as an extension of the root), greater longevity of absorbing roots, better utilization of low-availability nutrients, and better retention/storage of soluble nutrients, thus reducing reaction with soil colloids or leaching losses.
- Increased **mobilization and transfer of unavailable nutrients** (P, N, S, micronutrients Cu, Zn) from the soil to the plant.
- Better development of **P solubilizing bacteria** in the mycorhizosphere
- Increased establishment, nodulation and atmospheric **nitrogen fixation** capacity in legumes
- Modification of **plant-microbe relations**: mycorrhizae influence the colonization of roots by other microorganisms which can provide additional benefits.
- Modification of **soil-plant-water relations**, promoting better adaptation of plant to adverse environmental conditions.

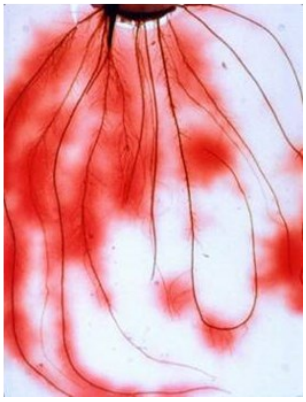
1Adapted from: R. M. Muchovej, SS-AGR-170, Agron. Dept., FCES, IFAS, Univ. of FL, 2001.

Myconate® Increases Root Growth

Absorbing Root Area Comparison

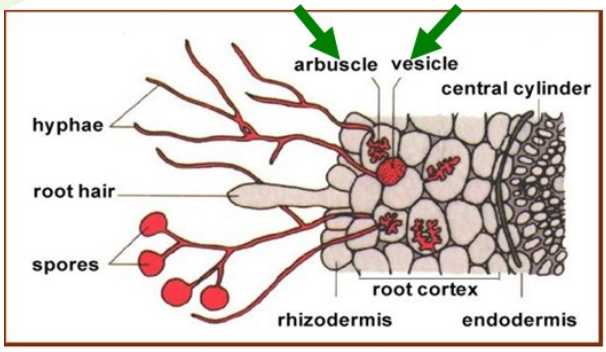
Nonmycorrhizal Roots | **VAM Roots**





Red stain indicates the effective absorbing area in a fescue. Photos by D. Malinowski, ARS/USDA

Cross-Section of Root



(Gisi, U. Bodenoekologie, Georg Thieme Verlag Stuttgart 1997, S. 220)

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