



## Potatoes and peppers inoculated with mycorrhizae get yield boosts of up to 50 percent!

**Dr. David Douds, research soil microbiologist with the USDA**, is looking at the impact of mycorrhizal fungi (MF) on crop yields, Douds began inoculating plants in the greenhouse and then tracking their performance in the field.

"We had some plants that were inoculated with a control mix with no inoculum, another one inoculated with a mix of mycorrhizal fungi, and another inoculated with just one species commonly present in commercial inoculum," Douds explains. "We transplanted them into the Compost Utilization Trial,"--another ongoing experiment at The Rodale Institute--"and we found over the course of the 3-year experiment that the mixture of mycorrhizal fungi increased the yield of marketable-sized peppers up to a maximum of 34% over the control. Last year we tried inoculating potatoes, and we got up to a 50% increase over the controls."

This year they are repeating the potato trial, measuring yields under four different treatments: one with no added MF; one with a commercially available MF; one with a mixed MF inoculant grown in a leaf compost and vermiculite medium; and one with a mixed MF inoculant grown in a dairy manure compost and vermiculite medium. Overall, this work suggests that a small amount of mixed MF inoculant can be substituted for a large amount of fertilizer--with no loss of yield, greatly reduced environmental impact, and lower production costs.



**Left: David Douds and a research intern dig potatoes in this season's mycorrhizal test plot** at the Rodale Experimental Farm. In last year's trials, potatoes grown with mycorrhizal fungi showed yield increases of as much as 50%. Other crops known to respond dramatically to mycorrhizal colonization include citrus, onion, and strawberries.

One unexpected finding of Douds' work at Rodale "is that mycorrhizae can be used to increase the yield of crops even in soils that are very high in phosphorous." Some of the soils at the Rodale Farm which have been heavily composted, Douds notes, "have available P in excess of 300 parts/million"--well above the level at which mycorrhizal responses are typically seen, around 20-50 ppm available P. "The generalization would be that P as high as 300 would be a situation in which the plant can take up all the P that it needs by itself without relying on the

mycorrhizal fungi." Douds believes that at high nutrient levels, some of the other benefits of MF--enhanced disease resistance, improved soil aggregation and better water relations--could be showing an effect.