E. coli thrives near plant roots, can contaminate young produce crops

November 3 2010, by Brian Wallheimer

E. coli can live for weeks around the roots of produce plants and transfer to the edible portions, but the threat can be minimized if growers don't harvest too soon, a Purdue University study shows.

Purdue scientists added *E. coli* to soil through manure application and water treated with manure and showed that the bacteria can survive and are active in the rhizosphere, or the area around the plant roots, of lettuce and radishes. *E. coli* eventually gets onto the aboveground surfaces of the plants, where it can live for several weeks. Activity in the rhizosphere was observed using a bioluminescent *E. coli* created by Bruce Applegate that glows when active. Applegate, a co-author on the project, is an associate professor in the food science and biological sciences departments at Purdue.

"*E. coli* is actually quite active in the rhizosphere. They're eating something there - probably plant exudates," said Ron Turco, a professor of agronomy and co-author of the study published in the November issue of the *Journal of Food Protection*.

Turco said the *E. coli* didn't survive on the plants' surfaces more than 40 days after seeds were planted. Harvesting produce at least 40 days after planting should reduce the possibility of contamination, but he warned that *E. coli* could still come from other sources.

"In actual field application, you pick up other things that are all around," Turco said. "You don't just get the plants that are 40 days old. An animal

getting loose in a field could also contaminate plants."

Mussie Habteselassie, Turco's former postdoctoral researcher and now an assistant professor of soil microbiology at the University of Georgia's Griffin campus, said harvesting practices in manure-treated fields can be critical for produce crops.

"If you harvest young and old plants together or mix them after harvesting, there is risk of contamination of the older plants," Habteselassie said. "If plants are uprooted during harvest, there is also a possibility of contamination from *E. coli* living in the rhizosphere."

Producers should apply manure to fields well in advance of planting and harvesting. Turco said a wait of 90-120 days between manure application and harvesting, with a minimum of 40 days between planting and harvesting, should minimize the chance of *E. coli* contamination.

Turco said he would continue studying *E. coli*'s ability to survive in different situations, including in water and processed produce. The U.S. Department of Agriculture funded the research.

Provided by Purdue University

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