Manure Management To Prevent Produce Contamination

ECHO Inc.

Westerners are often cautious about eating uncooked vegetables when traveling in the tropics, and recently several people in the USA became ill after eating imported vegetables, creating increased awareness of food contamination issues.

Many of us probably assume these health problems originate when food is washed with contaminated water or because of poor human hygiene. However, it could also come from the use of manure as a fertilizer in the field.

The increased consumer awareness of this issue has caused concern among organic growers in the U.S. and growers in those countries which export to the West (in addition to their usual concern about the safety of their own food supply). With that in mind, we reprint the following article from HortIdeas, October 1997.

"[The news has resulted] in efforts by extension and agricultural university staffers to educate growers on how to reduce risks due to pathogens commonly found in manure used as fertilizer. According to Cornell University horticulturist Stephen Reiners, several potentially hazardous bacteria are often found in fresh manure:

Escherichia coli typically is killed by summertime temperatures but remains viable under cooler conditions for as long as 77 days in slurry and for as long as 100 days in soil that has been fertilized with manure.

Salmonella species are frequently found in poultry, hog, and ruminant manure. These bacteria can remain viable for as long as two months in slurry and for as long as three weeks in manure-fertilized soil.

The *Campylobater jejuni* is found in both poultry manure and cattle manure; it remains viable for as long as 112 days (but typically less than two weeks) in slurry. Breakdown is accelerated by acidic conditions, high temperatures, lack of oxygen, and low moisture.

Listeria monocytogenes can remain viable for as long as three weeks in fresh manure and two months in slurry and manure-fertilized soil. It has been found on radishes three months following their harvest from contaminated soil. High temperatures accelerate breakdown.

Yersinia species occasionally contaminate manure, remaining viable for as long as three weeks in slurry and 330 days in soil. "The figures given above on survival of bacterial pathogens are probably worse-case estimates," says Reiners, who

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“The figures given above on survival of bacterial pathogens are probably worse-case estimates,“ says Reiners, who recommends the following guidelines for managing fertilizer manure as a minimum precaution.

“Store slurry produced during the summer for at least two months before using; store slurry produced during the winter for at least 90 days prior to using. Be aware that low-oxygen conditions favor longer-term viability of pathogens. Manure should never be applied to crops less than two months prior to harvest, and it should never be used as a sidedressing for food crops. Root vegetables and vegetables that contact the soil and are often eaten raw are most likely to cause health problems. Composting should kill most pathogens within days, assuming that it is done properly so as to achieve high enough temperatures throughout the piles. [Ed: I suspect that compost is seldom so carefully made.]

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