Manure Use:

Best Practices To Ensure On-farm Food Safety

Livestock manure commonly carries several harmful microorganisms or pathogens that can cause illnesses in humans, even when the carrier animal has no visible symptoms. Vegetables and fruits grown on recently manured fields can be at risk of becoming contaminated by those pathogens during the production cycle.

Post-harvest washing of produce may reduce surface contamination, but most commonly used disinfectants will not remove or kill all pathogens associated with the produce. Rough textured produce, such as cantaloupes or other melons, pose an even greater problem for pathogen removal via washing. Therefore, the preferred goal for growers is to prevent produce from becoming contaminated on the farm and/or in the packing shed.

Risks Associated With Manure Types

- *Highest Risk* – Fresh or raw manure that has not been aged or composted.
- *Moderate Risk* – Manure that has been aged for at least six months prior to application; pathogens are reduced with aging but still could be present.
- *Low Risk* – Composted manure that has been actively decomposed at 131-160 degrees Fahrenheit in a static pile for three days or in a windrow (turned a minimum of five times) for 15 days.

Recently Composted Manure

- Should be left undisturbed for 45 days to cure following high temperature stage.
- Should be stored away from "active" compost piles to prevent cross-contamination.
- Should be stored as far away as practical from production areas or open water sources.
- Should have physical and wind barriers to minimize the chances of water runoff or wind drift to growing produce or open water sources.
- Should NOT be used to make compost teas.
- Should not be transported in trucks used to transport raw manure.

Manure Storage and Handling

- Manure should be stored in an area that is physically isolated from produce handling facilities, harvesting equipment, fields used to grow fruits and vegetables and open water sources. There should be adequate barriers to minimize the risk of leaching, runoff or spreading by wind.
- Manure slurries that will be applied to produce fields should be placed in a separate storage container that after filling will be held for 60 days in the summer and 90 days in the winter prior to land application.
- Manure storage facilities should have a roof and show no signs of liquid runoff from the storage area following a rainfall event. Manure should never be piled in the field or on bare soil.
- Manure storage units should have surface water diversions to prevent runoff from entering storage areas plus a perimeter drainage system to prevent groundwater entry from the storage areas.
- Produce growers should develop an emergency plan in case of a pit failure or spill. In addition, they should have a farm environmental impact assessment and records of the physical changes required to minimize the risk of manure movement into water tributaries and other fields in place PRIOR to storage and handling activities.

Manure Application and Buffer Zones

- Following application, manure should be incorporated into the soil as soon as possible. The time between manure application and harvest should be maximized whenever possible.
- Farms should use production practices such as trellising, staking or plastic mulches to minimize contact of produce with manure.
- No manure teas should be used on produce crops.
- Manures should not be used to side-dress or top-dress produce crops.
- Crop residues or cover crops always should be used to minimize manure nutrient leaching or runoff from fields. Cover crops or "filter strips" should be planted along field boundaries and along water courses to minimize manure runoff.
- Produce should never be grown in fields that might receive manure runoff from other fields following irrigation or rainfall events.
- Manure should never be applied on water-saturated fields that will be prone to flooding or runoff. Also, manure application should be restricted on frozen or snow-covered ground.
- Detailed records should be kept of fields that receive manure, including rates and dates of application.

Manure Sources and Records

- Farms should use manure sources that provide information and written documentation about the manure handling practices used.
- Manure sources should provide test results showing the composting process effectively controlled any pathogens of concern.
- Farms choosing to produce their own compost should use only sanctioned procedures and should maintain records of temperatures during the composting process.
- Farms should maintain accurate records of the dates, fields, quantities and application methods used to distribute manure on farmland.

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