Good Agricultural Practices (GAP) for Fresh Fruit and Vegetable Growers

New England Extension Food Safety Partnership

Project funded by USDA CSREES – Project Number 2000-05389
Manure and Compost

Handling & Application
Options in Terms of Risks

1. Fresh or Raw Manure (highest risk)
   - Manure that has not been aged or composted

2. Aged Manure (medium risk)
   - Manure that has aged for at least 6 months prior to application

3. Composted Manure (lowest risk)
   - Manure that has been properly composted
Fresh or Raw Manure (highest risk)

- Valuable source of nutrients, but also high in human pathogens
- All manure contains pathogens
- Safety considerations
  - Soil splash on crops
  - Runoff
  - Contaminating water supplies & harvest equipment
  - Application times
Fresh or Raw Manure

Application Recommendations

- Incorporate into the soil (after harvest period) no later than December 10
  OR

- Incorporate into the soil (early spring) two weeks before planting, preferably to grain or forage crops.
  - DO NOT harvest vegetables or fruits until 120 days after manure application

*Avoid growing root and leafy crops in the year that manure is applied to a field*
Fresh or Raw Manure

Application Recommendations continued

- NO side/top-dressing of crops with fresh or raw manure!
- This is an important step toward reducing the risk of microbial contamination
Aged Manure  
(medium risk)

- Better alternative than using fresh or raw manure
- Age for at least 6 months
- Pathogens reduced, but still could be present

*Avoid growing root and leafy crops in the year that manure is applied to a field*
Aged Manure

- **Application Recommendations**
  - Incorporate into the soil (after harvest period) no later than December 10
  - OR
  - Incorporate into the soil (early spring) two weeks before planting, preferably to grain or forage crops.

  *DO NOT harvest vegetables or fruits until 120 days after manure application*
Composted Manure
(lower risk)

- Substantially reduces microbial pathogens
- Finished product will yield a valuable soil amendment, with few pathogens, if composted properly.

Safety Considerations

- Compost temperature not monitored
- Failure to properly turn compost pile
- Finished compost contaminated by nearby manure piles
- Curing finished compost
Properly Composting Manure

- Two popular methods
  1. In-vessel or static aerated pile system
     - Temperatures must be maintained of at least 131 °F for 3 days

Aerated Bay Compost System. URI Peckham Farm, September 2010.

Forced aeration. A powered blower will force air through this pipe to the compost pile. A slotted wooden floor will cover the aeration pipe.
Properly Composting Manure

2. Windrow composting system
   - Temperatures must be maintained at least 131 °F for 15 days, during which time, the materials must be turned a minimum of five times.
Properly Composting Manure
Properly Composted Manure

- High temperatures are maintained by:
  - Manipulating the compost pile inputs (feed stocks)
  - Proper carbon to nitrogen ratios
    - Initial C:N ration of between 25:1 and 40:1
  - Moisture percentage
  - Aeration
Going the Extra Step

- Cure compost
  - Leave finished compost in an undisturbed pile for at least 2 months.

- Remember
  - Keep curing or finished compost away from ‘active’ compost piles.

**Best practice: store, cover or apply finished compost immediately following curing stage.**
More considerations for using Raw, Aged or Composted manure

- Store manure and compost piles as far away as practical from areas where fresh produce is grown and handled
- Where possible, erect physical barriers or wind barriers to prevent runoff and wind drift of manure
Quick Overview

- Best Practice: Composting manure
- Apply fresh or aged manure into the soil no later then December 10
- Do not harvest produce for 120 days if applying raw or aged manure in spring
- No side/top dressing!
- Keep active compost piles from leaching into fields or onto harvest equipment
- Keep finished compost piles away from active compost piles