

Managing Manure Applications

Animal manure is a valuable agronomic resource for growing crops. However, it is important to follow proper handling and application Best Management Practices (BMPs) so your crop receives the nutrient benefits while protecting the environment and human health.

Surface water sampling in the Central Valley has found exceedances of State surface water quality standards for *E. coli* bacteria. Potential sources of bacterial contamination are leaky sewer lines or septic systems, runoff from livestock operations, irrigated pasture, domestic animals (dogs, cats), wildlife, manure applied to farmland and washed off in rain or irrigation, or allowing livestock uncontrolled access to creeks.

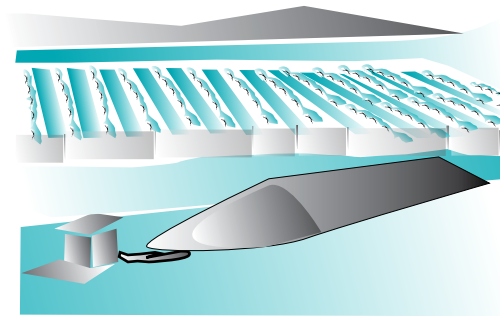
Since animal manure used on cropland can potentially be a source of *E. coli* bacteria, landowners and operators should consider the following practices when storing or applying livestock manure. The information below is condensed from several sources, including "Good Agricultural Practices" developed by the Almond Board of California.

When applying manure as a nutrient to soils, check with a nutrient specialist such as a Certified Crop Adviser (CCA). Under new Central Valley Regional Water Board regulations, California dairymen must use a CCA-approved nutrient management plan for their cropland when applying manure. They must also submit sampling results of manure sources, irrigation water and soil. For a complete description of NRCS cost sharing manure management programs, please consult the publication:

ftp://ftp-fc.sc.egov.usda.gov/CA/technical/cnmp/590_AFO_Manure_Nutrient_Mgt_2008.pdf.

Animal Manure: A Potential Pathogen Source

- Non-composted or incompletely composted manure may carry harmful pathogens.
- Pathogens include bacteria that may potentially cause human illnesses.
- Pathogens can survive in the field for 9 to 12 months or longer after a manure application.
- There is lower pathogen risk from manure or compost that has undergone a composting process with appropriate time and temperature controls.
- Fresh manure has the highest pathogen risk followed by aged/stacked manure. Correctly composted manure has the lowest pathogen risk.
- Manure and compost applications should be closely managed.



MANAGING MANURE APPLICATIONS

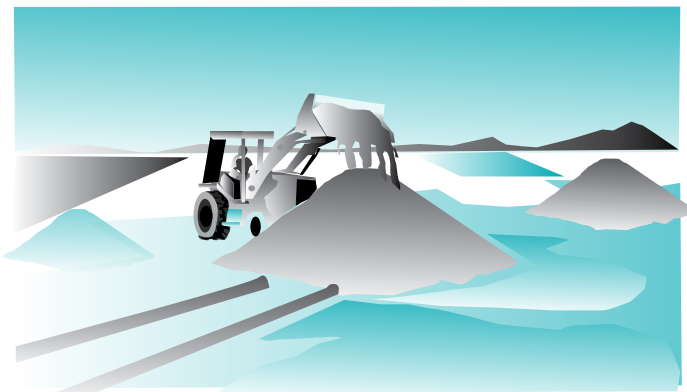
Manure Application Practices

Orchards, vineyards, other permanent crops

- Incorporate manure into soil as soon as practical after application to prevent wind drift and runoff in storm water or irrigation drainage water.
- If incorporation isn't possible, using adequately composted materials will minimize pathogen risk.
- Use proper land application practices to prevent rainfall runoff from transporting manure and nutrients into waterways. When possible, incorporate or inject manure when applying prior to the rainy season.
- Follow practices that reduce erosion and runoff from irrigated fields treated with manure (i.e. tailwater recirculation systems, sedimentation basins, vegetative filter strips, cover crops, residue management, special tillage practices).
- Do not apply manure near waterways unless protected with berms; use appropriate setbacks.
- Do not apply manure to saturated fields or when storms with runoff potential are forecast.
- Avoid applying manure to steep fields when runoff carrying manure can be expected to reach a water course.
- Where possible, divert rainfall runoff from upslope areas around cropland that receives manure.
- If tail water is generated during irrigation with liquid manure, a return system should be installed to recycle drainage water.
- Do not top dress with fresh or slurry manure (unless properly incorporated).
- Use biosolids or municipal waste only if allowed by local regulations.
- Document compost/manure applications.
- Date, rate and location

Leafy Greens*

- Raw manure and biosolids should not be used in the production of fresh leafy greens.
- The Leafy Green Marketing Order mandates a minimum 12-month waiting period for the application of raw manure or biosolids before planting fresh leafy greens. Some produce buyers will disqualify fields where animal manure or biosolids have been applied.
- Uncomposted manure should never be applied to fields just before planting to "ready-to-eat" crops.
- Only composted manure that satisfy established standards should be used.



MANAGING MANURE APPLICATIONS

Storing Manure and Compost

- Develop physical barriers to help prevent storm water contamination by runoff from stacked piles to waterways.
- Plan field storage and application so rainfall does not cause runoff from stacked piles.
- Locate piles away from sensitive areas, cover or provide other barriers to minimize wind-driven particle drift onto unintended products, crops or waterways, as needed.

Animal Husbandry Management Practices

- Control animal and equipment access to streams, stream banks and sensitive areas.
- Construct all animal facilities (barns, arenas, etc.) and manure composting/storage a sufficient distance from streams, drains and domestic wells to provide protection from runoff.
- Construct an adequate storm water collection system or earthen berm in cases where water quality can be impacted by facility drainage.
- Adopt pasture management practices appropriate for field conditions (i.e. slope, vegetation density, proximity to waterway, etc.)
- Use wetlands to capture tailwater and reduce runoff rates from pastures.
- Maintain berms, vegetated buffers or other conservation measures between streams and animal facilities and manure composting/storage areas.

Buying/Using Compost

- Manure that has been simply stacked and aged does not qualify as compost.
- If you buy compost, ask the compost producer for documentation that they have followed proper pathogen reduction procedures.

Minimum composting standards*:

For windrow compost:

- Active compost must maintain aerobic conditions for a minimum of 131 F for 15 days, with a minimum of 5 turnings.

For aerated static pile compost:

- Active compost must be covered with at least 12 inches of insulating materials and maintain a minimum of 131 F for 3 days.

*Source: Commodity Specific Food Safety Guidelines for the Production and Harvest of Leafy Greens



Information sources for animal manure management.

<http://www.cpif.org/Environment/nutrient.htm>

<http://www.cacca.org/>

www.cdqa.org

<http://www.ams.usda.gov/nop/indexIE.htm>

<http://www.ota.com/organic/foodsafety/manure.html>

www.organicfertilizerassociation.org

<http://cetulare.ucdavis.edu/pubgrape/ng797.htm>.

<http://animalscience.ucdavis.edu/avian/pfs10.pdf>

www.westernuniteddairymen.com

[illegible]