

Manure Nutrient Management

Capture Land-Applied Manure in the Root Zone

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Management practices that capture land-applied manure in the root zone will increase nutrient availability, improve soil quality, and prevent manure nutrient and contaminant losses in runoff. The idea of capturing manure in the root zone is quite simple, but in practice it can be quite challenging as weather, soil and site-specific field conditions change.

The single most important tool in preventing manure nutrient and contaminant losses to the environment is *your* knowledge of *your* fields. Know which fields are erosive and prone to rapid runoff during snow melt and spring rains. Manure will be lost in runoff water, so soil conservation practices should be employed to stabilize soil and hold land-applied manure in place.

The best manure management plans are custom designed on a field-by-field basis. These plans will be designed within the context of established best management practices and fine-tuned for each field by using a process of *application*, careful *observation*, and *evaluation* of results. *Apply* manure, *observe* what happens, and *evaluate* the effectiveness in capturing manure in the root zone where it will benefit your cropping system rather than be lost in runoff.

Actions to Reduce the Risk of Manure Runoff

1. Evaluate your farm on a field-by-field basis and rank the fields based on the potential for manure loss. Ask yourself: "If it rains tomorrow, will runoff leave the field?" Then ask yourself what could be done to minimize this risk.

2. Excessive application rates increase the chance of manure running off the field. Calibrate manure spreaders and verify that the desired rate is the rate that is actually applied to the field. See the January 2004 issue of the Michigan Dairy Review. Based on observation and evaluation, determine the right application rate for your fields.

3. On some fields, the right rate by volume may be considerably less than the agronomic rate. Tile drained land needs special attention, especially with very dilute manures. Macropores and soil cracks can be direct conduits to tile lines. Check tile outlets before and after manure applications. Decrease rates and/or utilize tillage to disrupt flow to tile lines.

4. Inject manure, incorporate manure shortly after application, or loosen the soil with tillage before spreading to create a rough, permeable surface. This will encourage the

manure to stay in the root zone and not run off.

5. Use soil and water conservation practices such as crop residue management, grassed waterways, buffer strips, strip crops, or planting on the contour where applicable.

6. Use spreading setbacks to separate manure from streams and from ditches that flow to streams.

7. Establish a cover crop that will be growing during manure applications. Cover crops reduce sediment and nutrient runoff and improve infiltration.

8. Avoid spreading in the rain or when rain is in the forecast.

9. Read, understand and adopt the *Generally Accepted Agricultural and Management Practices for Manure Management and Utilization*. These will form the foundation of your site-specific manure application plan. These practices include following:

- Manure should be applied uniformly and the amount applied should be known.

- Manure should not be applied to soils within 150 feet of surface waters or to areas subject to flooding unless manures are injected or surface-applied with immediate incorporation (i.e., within 48 hours of application) and/or conservation practices are used to protect against runoff and erosion losses to surface waters.

- Liquid manures should be applied in a manner that will not result in ponding or runoff to adjacent property, drainage ditches, or surface water.

- As the slope of land increases, the risk of runoff and erosion also increases. Soil and water conservation practices should be used to control runoff and erosion for a particular site.

- Records should be kept of manure analyses, soil test reports, and rates of manure application for individual fields.

More Information Is Available

Three, one-page fact sheets by Dr. Tim Harrigan, provide excellent background reading on surface application of manure. Collectively called "Capturing Land-applied Manure in the Root Zone", the individual fact sheets are:

- Part 1: Sediment and Contaminant Runoff
- Part 2: Tile-Drained Land
- Part 3: Spreading on Frozen and Snow-Covered Ground

These fact sheets can be found at:

http://www.egr.msu.edu/age/aenewsletter/mainpages/agri_eng_info_series.htm or contact your County Extension office .

A Reminder

In the event of a manure release to surface waters, call the Pollution Emergency Alerting System 1-800-292-4706.