

# Turkey Manure Handling

## Best Management Practices

UNIVERSITY OF MINNESOTA  
DOCUMENTS

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### I. STORAGE

The key to safe and effective storage is proper site selection.

#### DO:

- Become familiar with the soil type of the farm location.
- Select "leach-resistant" (fine textured) soil types such as clay.
- Provide a ground cover (impervious pad) if the soil type is coarse textured.
- Provide a cover crop buffer area around all storage areas.
- Place out of public view, when possible, both for aesthetics and odor control.
- Provide proper shoreline setback and screening.

#### DON'T:

- Site new facilities near lakes, ponds, rivers, streams or wells.
- Allow abandoned facilities to remain adjacent to lakes, ponds, rivers, streams, ditches or wells. The facilities should be removed or modified to be able to achieve the objectives stated above.
- Store for more than 12 months.
- Site in areas subject to surface water flooding.

### II. USE OF MANURE AS A FERTILIZER

Turkey manure is a valuable natural resource when properly applied. To insure proper application, consider:

### Chemical Analysis

#### (manure and soil):

- There must be analysis of discarded manure on a periodic basis, since manure piles may vary considerably in composition.
- Turkey manure (growout) commonly offers (in pounds per ton wet weight basis) 52 pounds total nitrogen (N), 48 pounds phosphorus ( $P_2O_5$ ) and 26 pounds potassium ( $K_2O$ ). Data presented are averages. Actual amounts will vary due to type of manure, storage, etc.
- Conduct soil analysis to understand what your soil already has available

### Formulation/Application:

- Applying at the appropriate rate for the crop must be based on the analysis, most likely at 2 to 4 tons per acre.
- Based on yield goals, determine what your crop will actually need.
- Use equipment that is capable of even and accurate application.
- Properly calibrate your application equipment.
- Avoid spreading manure on frozen ground.
- Maintain a record of past spreading rates as you would with fertilizer applications.
- Consider mineralization rates (e.g. 10 pounds of organic nitrogen will have 3 to 3.5 pounds available for the first year) and available nitrogen content.

### Common Sense:

- Apply when least offensive to your neighbors, accounting for time of day and wind direction.
- Do not apply in areas that have high potential for runoff.
- Apply only when manure can be immediately incorporated into the soil.

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- Do not apply within 100 feet of a river, lake or stream.

There is no evidence that antibiotics ingested by turkeys are making their way into the groundwater via the application of turkey manure. Antibiotics are degraded by microorganisms in the environment.

Excessive spreading puts everyone at risk, particularly as it relates to the contamination of groundwater by nitrates and surface water by phosphorus, so please follow recommended application rates closely.

### III. FEED UTILIZATION

Turkey manure also has value as a feed source for beef cattle.

- When evaluating nutrient content, consider analyses for:
  - Moisture
  - Total digestible nutrients (TDN)
  - Protein (have at least 18%)
  - Bound nitrogen (not to exceed 25% of crude protein)
  - Crude fiber
  - Minerals (copper, calcium)
  - Ash (not to exceed 28%)

- Processing (Required before feeding)

Ensiling—Include manure at 20 to 30% of dry matter of silage crop.

Deep Stacking—Cover with polyethylene and process for at least 20 days to allow heating to a minimum of 130 degrees F. Avoid excessive heating (greater than 140 degrees F).

- Suggested feeding levels:

Dry brood cow—80% litter, 20% corn

Stockers (1 pound gain/day)—10% to 40% of diet dry matter; feed hay free choice.

- Warnings: Consult with county extension agent, Minnesota Department of Agriculture or a veterinarian before beginning feeding. Generally excluded are sheep and milking dairy cows, due to possible residues. Do not feed within 15 days of slaughter.

### IV. FINANCIAL VALUE

Both as a natural fertilizer and feed source, turkey manure is an asset with income-earning power.

- To calculate the fertilizer dollar value of turkey manure, follow these steps:

**Step #1:** Identify the current cost per ton of the comparative chemical fertilizer:

- Anhydrous ammonia (82-0-0) for nitrogen (N)
- Triple super phosphate (0-46-0) for phosphorus ( $P_2O_5$ )
- Potash (0-0-61) for potassium ( $K_2O$ ).

**Step #2:** Obtain pounds of appropriate nutrient (N, P or K) in a ton of fertilizer:

Anhydrous ammonia, 82% nitrogen or 1,640 lbs. of N (2,000 lbs. x .82)

Triple super phosphate, 46% phosphorus or 920 lbs. of P (2,000 lbs. x .46)

Potash, 61% potassium or 1,220 lbs. of K (2,000 lbs. x .61)

**Step #3:** Divide cost per ton by pounds of nutrient to yield cost per pound.

**Step #4:** Calculate value for a ton of turkey manure based on its nitrogen content.

**Step #5:** Complete similar calculations for phosphorus and potassium.

**The result:** The resulting number yields the dollar value per pound.

**Example calculation for value based on nitrogen content:**

1. Chemical anhydrous ammonia cost is \$200/ton.
2. Amount of N = 2,000 lbs. x .82 = 1,640 lbs. of N
3. Value of N = \$200 divided by 1,640 lbs. N = \$.122/lb. N
4. Value of turkey manure based on N = 52 lbs. N/ton x \$.122 = \$6.34/ton

- Maximum value of turkey litter for feeding cattle can be roughly estimated at a value 50% of soybean meal since the protein content of litter is approximately half of soybean meal. Actual sale value would be more likely in the range of 30% to 40% of soybean meal price.

## V. TRANSPORTATION

Care must be given to make sure that turkey manure is transported in a manner that is environmentally sound, biosecurity-based and publicly acceptable, which means:

- Using the proper type of truck or trailer that is well-maintained.
- Containing material with sideboards and covers when necessary on any public thoroughfare. Transport must be leakproof on highways.
- Choosing routes that avoid population centers.
- Properly cleaning and disinfecting transports after use to avoid disease transmission.

## VI. REGULATIONS

Turkey growers must make sure they comply with the many regulations now governing the storage and use of manure.

- Be aware that though you may sell your manure, you may still have legal responsibility if it is misapplied by the party to whom you sold it.
- Feedlot permits for turkeys can be obtained only if you can demonstrate you have enough available land to handle the amount generated by your operation in accordance with Minnesota Pollution Control Agency standards. On the average, nutrients produced per 1,000 turkeys are (lb./yr.) 3,080 N, 2,464 P<sub>2</sub>O<sub>5</sub> and 2,002 K<sub>2</sub>O.

## VII. ALTERNATIVES

If you choose to manipulate your manure in any form, there are some things to consider.

### Composting

- Definition: A treatment of manure where microbial activity converts a waste product into a stable humus under aerobic conditions, during which time the material heats (130 to 160 degrees F) and reduces its total mass.
- Composting's advantages rest in its ability to stabilize and concentrate the available nutrients and to reduce the labor and energy needed to transport and apply manure.

- Check with Board of Animal Health for details regarding composting of dead turkeys.
- All storage precautions must be adhered to when composting.

### Fertilizer

- Plain, unmanipulated manure is not a fertilizer under Minnesota Department of Agriculture definition.
- Once manure is "manipulated," or claims are made regarding its value as a fertilizer or soil amendment, it becomes a fertilizer. This means that then the product must be registered and the location licensed, both resulting in payment of fees to the Minnesota Department of Agriculture.

## VIII. PUBLIC RELATIONS

Turkey manure is a valuable resource, but the public must be made aware of this fact. When visiting with your neighbors or government officials, remember:

- Manure usage is a recycling process based on nature's own model of providing crop nutrients.
- Manure is an organic material that is friendly to the earth, improving soil structure.
- Manure is a commodity that has financial value, bringing money into the community through its sale.
- As a turkey industry member, you need to promote the appropriate use of manure.
- Efforts now may help the industry avoid regulations later.

## IX. FOR MORE INFORMATION

Minnesota Pollution Control Agency...612/296-7326  
(Feedlot permits, composting)  
Minnesota Department of Agriculture...612/297-4871  
(Licensing and registration)  
Minnesota Soil Conservation Service—John Brach  
612/290-3672  
Minnesota Board of Animal Health...612/296-3428  
(Disposal of dead animals)  
County and local governments...see local listing  
Minnesota Extension Service—Animal Science  
Sally Noll...612/624-4928

Minnesota Extension Service—Soil Science  
John Moncrief...612/625-2771  
Minnesota Department of Natural Resources  
612/296-4800 (Lake/wetland permits  
program and flood plain/shore line management)

## X. RESOURCE MATERIAL

- “Utilizing Poultry Waste In Ruminant Feeding.” J. Fontenot. 1988. In *Proceedings of National Poultry Waste Management Symposium*, p. 52-64.
- “Utilization of Poultry Waste By Feeding Cattle.” H. J. Gerken. 1990. In *Proceedings of National Poultry Waste Management Symposium*, p. 115-122.
- Feeding Broiler Litter to Beef Cattle.* B.G. Ruffin and T.A. McCaskey. 1990. Alabama Cooperative Extension Service, Auburn University, Auburn, Ala.

- Poultry Manure Survey.* S. L. Noll, M. Hamre and J. Moncrief. 1990. Minnesota Extension Service, University of Minnesota.
- Poultry Manure Management—Delaware Guidelines.* 1989. Cooperative Extension Service, University of Delaware, Newark, Del.
- Fertilizer Recommendations for Agronomic Crops in Minnesota.* G. Rehm and M. Schmitt. 1990. AG-MI-3901, Minnesota Extension Service, University of Minnesota.
- “Composting Manure and Sludge.” J. Sweeten. 1988. In *Proceedings, National Poultry Waste Management Symposium*, p. 38-44.

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The Environmental Work Group of the Minnesota Turkey Growers Association provided input for this publication. Members of the group were Kevin Custer, Keith Frienshuh, Gregg Gleichart, Mert Hanson, John Hausladen, Craig Holden, Kevin Janni, Tim Johnson, Keith Langmo, Sally Noll, Bill Rothfork, Ken Valley, Daryl Velo and Charles Zimmerman.

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These Best Management Practices were developed by the Minnesota Turkey Growers Association and the Minnesota Extension Service—University of Minnesota, in cooperation with Minnesota Pollution Control Agency, Minnesota Board of Water and Soil Resources, Minnesota Department of Agriculture and Minnesota Soil Conservation Service. The information presented is in summary form. Readers are encouraged to consult the information sources listed herein with questions regarding individual operations.

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