Composting Tips

- Collect and analyze representative samples of nitrogen sources (swine waste) and carbon sources (corn stalks, straws, landscape waste).
- Identify, prepare, and maintain a compost site in accordance with IEPA regulations and the ILMF Act.
- Windrow carbon sources first.
- Place coarser, lighter weight materials at the bottom of the windrow.
- Add denser, wetter materials last.
- Use a windrow turner to mix and aerate materials (a front-end loader will work, but not as well as a turner).
- Many criteria can be used to monitor windrows during composting (O_2, CO_2, moisture, C:N, temperature, oxidation-reduction potential, etc.).
- Carbon:nitrogen ratios between 25:1 – 30:1 facilitate desirable composting.
- Maintaining moisture levels around 40 – 50% enhance the rate of composting.
- Monitoring of moisture, C:N and temperature will generally produce satisfactory compost.
- Turn windrows daily or every-other day during the first week.
- Turn windrows at least twice weekly for two – six weeks.
- Turn windrows once weekly from week six to eight or until maturity is reached (the windrow is no longer generating heat).
- Allow windrows to cure if the compost is destined for value-added use.
- Merchandizing compost as a value-added product may require screening cured compost.
- Always aerate maturing or cured windrows first, established windrows second, and new windrows last.

Quality Standards

Characteristics included in quality standards for producing value-added compost can include one or more of the following:

- Appropriate particle size
- Absence of sulfides
- Minimum level of nitrates
- Absence of viable weedseeds
- Optimum pH
- Minimum level of ammonium
- Appropriate level of O_2 and CO_2
- Appropriate redox potential
- Optimum moisture content
- Other characteristics specific to crop needs

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Composting Swine Waste

Should you, as a swine producer consider composting as an alternative waste management strategy? The Illinois State University Research and Teaching Farm composts all the livestock waste generated on the farm. The farm houses 540 animal units (A.U.) representing beef cattle, dairy, sheep, and swine. The farm composts 3,120 tons of livestock waste and 2,278 tons of carbon based waste (straws, corn stalks, landscape waste, etc.) producing 2,513 tons of cured compost, annually. The average cost to produce a ton of cured compost at the ISU Farm is $31.90:ton.

Markets for Compost

There are two basic markets for compost. One is the "volume" market for low quality compost. Low quality compost is given away or sold at low prices as cover for landfills, for use in abandoned mine reclamation, as an agriculture soil amendment, etc. The other market is the "value-added" market. Value-added markets are characterized by rigid quality standards with potentially higher economic return margins. End users of value-added compost include:

- Landscapers
- Sport turf users
- Nurseries
- Horticulturists
- Organic vegetable growers
- Organic soybean producers
- Others

Equipment Required for Composting at ISU

$44,425 – 85 hp tractor with creeper gear and loader

$40,000 – 100 hp tractor

$15,135 – side discharge spreader (212 Cu. Ft. Cap.)

$11,128 – rear discharge box spreader (206 Cu. Ft. Cap)

$25,000 – compost tuner (pull-type)

$20,000 – slurry tank (2,250 Gal. Cap.)

$155,688 – depreciated over 7 years at 10% interest with no salvage value

$ 1,980 – annual equipment expense

Annual Charges for Composting at ISU

$1 ,250 – Land (12.5 acres @ $100:acre)

$31,980 – Equipment

$2,000 – Repairs

$12,480 – Fuel

$32,462 – Labor

$80,172 – Total

Example Scenarios

3,000 sows gestation to nursery

- represents 3,012 A.U.
- produces 4,380,000 gal:slurry:year
- for composting requires solid-liquid separation removing at least 40% of the separable solids
- generates 630,720 lbs. solids @ 40% D.M.
- requires 191,850 lbs. or 96 tons of carbon waste to compost
- 99 tons is approximately 6.5 semi loads of wood chips of 99 1-ton corn stalk stacks
- if 1.5 tons of stalks are harvested per acre, 66 acres of stalks are necessary
- need 5 acre compost site
- Generates 190 tons of compost
- extends time between lagoon dreggings by 40%

700 sows gestation to nursery

- represents 705 A.U.
- produces 1,022,000 gal:slurry:year
- assumes all the slurry is composted
- requires 2,883,386 lbs. or 1,442 tons of carbon waste to compost
- 1,442 tons is the equivalent fall leaf collection of a municipality of 50,000 people
- need a 10.0 acre compost site
- generates 2,784 tons of compost

1,500 Sows Gestation to Nursery

- represents 1,506 A.U.
- produces 2,190,000 gal:slurry:year
- for composting requires solid-liquid separation removing at least 40% of the separable solids
- generates 315,360 libs. Solids @ 40% D.M.
- requires 98,859 libs or 50 tons of carbon waste to compost
- 50 tons is approximately 5 semi loads of wood chips or 50, 1-ton corn stalk stacks
- if 1.5 tons of stalks are harvested per acre, 34 acres of stalks are necessary
- need 1.5 acre compost site
- generated 95 tons of compost
- extends time between lagoon dreggings by 40%

30,223 Finishers

- represents 12,089 A.U.
- represents a years production from 1,500 sows
- produces 5,440,140 gal:slurry:year
- for composting requires solid-liquid separation removing at least 40% of the separable solids
- generates 1,958,454 lbs. solids @ 40% D.M.
- requires 613,935 lbs. or 307 tons of carbon waste to compost
- 307 tons is approximately 21 semi loads of wood chips or 307, 1-ton corn stalk stacks
- if 1.5 tons of stalks are harvested per acre 205 acres of stalks are necessary
- need 20 acre compost site
- generates 593 tons of compost
- extends time between dreggings by 40%