Water Quality

Focus Area
Nutrients
and
Bacterial
Wastes

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Dead poultry composter project

Bill Ball Composter

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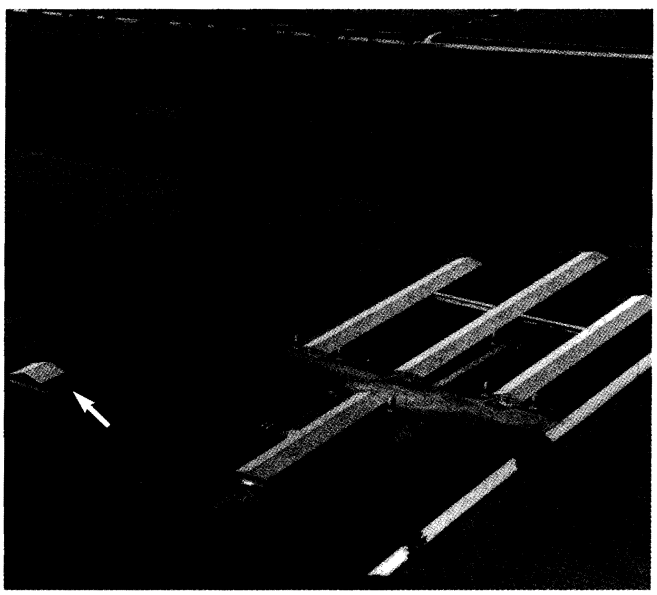
A grant of EPA funds was made available by the Missouri Department of Natural Resources in October 1990 to selected southwest Missouri poultry producers representing each of the five major poultry processing companies. The purpose of the grant is to demonstrate the feasibility of composting dead birds in an environmentally sound manner. The grant is administered by Southwest Missouri Resource Conservation and Development, Inc., with technical assistance provided by the Soil Conservation Service and educational activities provided by University of Missouri Cooperative Extension.

Bill Ball, of Carl Junction, MO, representing ConAgra, agreed to participate in the demonstration project. Ball's concerns about future regulations pertaining to dead bird disposal, potential complaints from neighbors and environmental considerations were factors in his decision to participate in the project. This guidesheet describes the composting project relating to Ball's poultry operation.



The Ball production facility with composter

Production facilities

The Ball tom turkey operation consists of four buildings in which 6.5 flocks per year are grown to a market weight of 30 pounds. Table 1 outlines the characteristics of each building.

Table 1.
Building Type and Bird Capacity in the Ball Operation

Building type	Number of birds	Weight in (lbs.)	Weight out (lbs.)	Time in bldgs (wks.)
brooder	11,000	0	6	6
intermediate	11,000	6	14	6
growout (2)	5,500 ea.	14	30	6-1/2 – 7

An aerial view of the building layout with composter for the Ball production facilities is shown. Average mortality rate in these facilities is about 12 percent, with peak rates at 14 percent.

Composter

The composter serving this operation is a pole-type structure with open sides and a wood-truss roof. Primary composting bins are located along either side of the structure, with the central part of the building used as a work area. Secondary compost bins are built along the rear of the building as shown in Figure 1.

The eight primary compost bins are 10 feet wide, 6 feet deep and 5 feet high, and are made with treated lumber. The two secondary compost bins are 10 feet wide, 24 feet long and 5 feet high. Total composting volume is 2,400 cubic feet in the primary bins and 2,400 cubic feet in the secondary bins. Figures 1 and 2

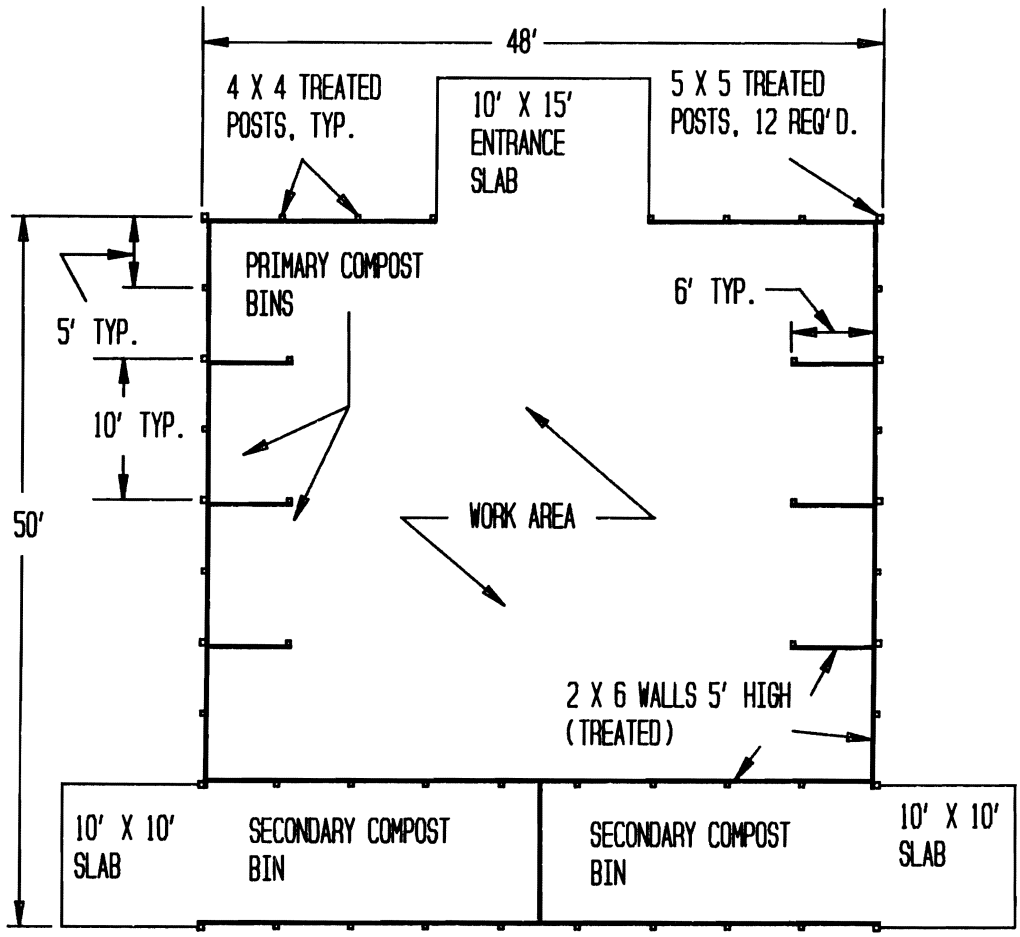


Figure 1. Plan view of the Ball composter

show dimensional and structural characteristics of the Ball composter.

The Ball composter is a pole-type structure with open sides and a wood-truss roof.

Operational characteristics

Ball estimates an average of about one hour and 15 minutes per day is required to properly manage the composter. This average includes the daily requirements to layer and cover the dead birds and the intermittent requirements to clean out and move primary compost to the secondary bins, bring litter to the composter from the production buildings and to field-spread the finished compost.

Ball uses a tractor with a front-end loader to handle litter, move compost and load spreading equipment. A beater-type manure spreader or litter hauling truck is used to spread finished compost. Finished compost containing significant amounts of straw is better handled by the manure spreader than a litter truck with spinner-plate spreader. Table 2 shows a laboratory analysis of the finished compost fertilizer value from the Ball composter.

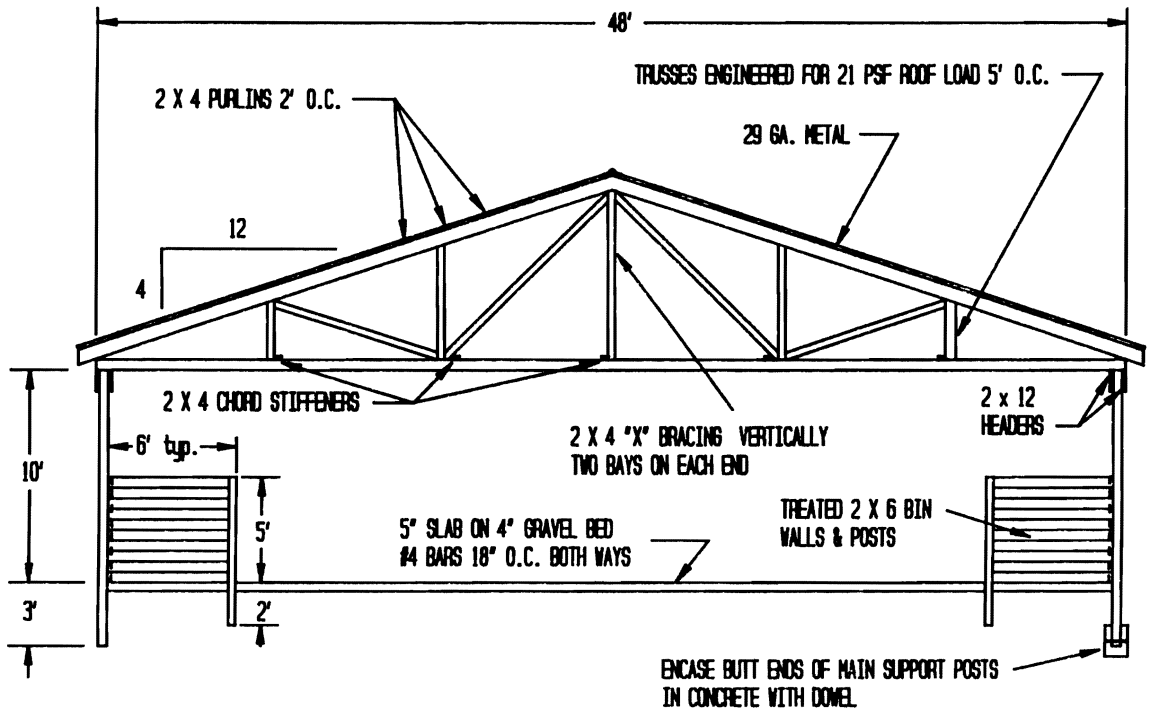


Figure 2. Cross section of the Ball composter

Table 2.
Analyses of litter and finished compost in the Ball operation

Fertilzer nutrient	Litter	Finished compost
Dry matter, %	85.8	87.6
Nitrogen, lb/ton	58.4	55.0
Crude protein, %	18.3	17.2
P_2O_5, lbs/ton	94.1	99.5
K_2O, lbs/ton	61.0	60.8

The Ball composter design does not include a litter ingredient storage area. A storage area providing at least two months storage would help the day-to-day operation of the composter. Since flocks are rotated on two-month intervals, a litter storage period of two months would allow transfer from production buildings to the composter in conjunction with flock rotation. Ball currently uses several of the primary composting bins for ingredient storage because mortalities are not at a level requiring their use. However, this storage volume is not sufficient for maximum efficiency.

Based on his experience thus far, Ball estimates that 165 tons of litter per year will be used. At this rate, a two-month storage area of 1,840 cubic feet, or an area equal to six primary bins in the Ball composter will be necessary. The use of 165 tons of litter per year in the composter represents 20 percent of the litter produced annually in the Ball operation. Ball estimates that 175 tons of finished compost are generated annually in his composter. This figure comes from the annual input of 165 tons of litter, 83 tons of dead birds and eight tons of straw into the composter. This mass balance implies that one-third of the input material weight is lost during the composting process.

A beater-type manure spreader can be used in spreading finished compost.

Ball indicates that traditional markets (buyers) for litter may be reluctant to purchase finished compost due to perceived aesthetic problems (a few visible bones, etc.) even though the finished compost is very similar to litter in fertilizer nutrient content.

Cost

Composter costs depend upon many factors such as site characteristics, composter design, size, etc. Table 3 shows costs incurred for the Ball composter as constructed in November 1990.

The design of the Ball composter includes a relatively large covered work area in the center of the building. Some growers may wish to reduce overall costs with a design incorporating the work area on an outside concrete slab.

Table 3.

Cost associated with the Ball composter (November 1990)

Item	Cost ($)
materials	8,000
labor	3,900
total	11,600

This guide published with funds provided to the Missouri Department of Natural Resources from the Environmental Protection Agency, Region VII. To learn more about water quality and other natural resources, contact the Missouri Department of Natural Resources, P.O. Box 176, Jefferson City, MO 65102. Toll free 1-800-334-7046.

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