Worksheet #1

Swine Loss and Sawdust Calculations

Annual Pig Production

1. _____ (# sows) x _____ (litters/yr) x _____ (pigs/litter (inc. stillborns)) = _____ pigs born/yr

2. _____ (pigs born/yr) - (_____ (pigs born/yr) x _____ /100 (% pre-weaning loss)) = _____ weaner pigs/yr

3. _____ (weaner pigs/yr) - (_____ (weaner pigs/yr) x _____ /100 (% weaning loss)) = _____ grower/finisher pigs/yr

4. _____ (grower/finisher pigs/yr) - (_____ (grower/finisher pigs/yr) x _____ /100 (% grower /finisher loss)) = _____ finished hogs/yr

Death Loss Material to be Handled

a. Sow/Boar Losses

_____ (# sows/boars) x _____ lbs (Avg. Wt.) x _____ /100 (% sow/boar loss) = _____ lbs loss/yr

b. Pre-weaner losses (including stillborns)

_____ (pigs born/yr) x _____ lbs (Avg. Wt.) x _____ /100 (% loss pre-weaning) = _____ lbs loss/yr

c. Weaner losses

_____ (weaner pigs/yr) x _____ lbs (Avg. Wt.) x _____ /100 (% weaner loss) = _____ lbs loss/yr

d. Grower/finisher losses

_____ (grower/finisher pigs/yr) x _____ lbs (Avg. Wt.) x _____ /100 (% grower/finisher loss) = _____ lbs loss/yr

Total Death Loss (add up group losses) = _____ lbs loss/yr

Average Daily Death Loss

_____ lbs/yr (total death loss) ÷ 365 = _____ lbs loss/day

Annual Sawdust Requirements

_____ lbs loss/yr (total death loss) x 0.0037 = _____ cu yards/yr

Note: Up to 50% of the sawdust can be replaced by finished compost

Conversion

_____ cu yards/yr (sawdust requirements) x 0.7645 = _____ cu metres/yr

Worksheet #1 - Example

Example: Swine Loss and Sawdust Calculations

200 Sow Farrow to Finish Operation

Annual Pig Production

1. 200 (# sows) x 2.3 (litters/yr) x 13.0 (pigs/litter (inc. stillborns)) = 5980 pigs born/yr

2. 5980 (pigs born/yr) - (5980 (pigs born/yr) x 19/100 (% pre-weaning loss)) = 4844 weaner pigs/yr

3. 4844 (weaner pigs/yr) - (4844 (weaner pigs/yr) x 2.6/100 (% weaning loss)) = 4718 grower/finisher pigs/yr

4. 4718 (grower/finisher pigs/yr) - (4718 (grower/finisher pigs/yr) x 4.2/100 (% grower /finisher loss)) = 4520 finished hogs/yr

Death Loss Material to be Handled

a. Sow/Boar Losses

200 (# sows/boars) x 440 lbs (Avg. Wt.) x 5.5/100 (% sow/boar loss) = 4840 lbs loss/yr

b. Pre-weaner losses (including stillborns)

5980 (pigs born/yr) x 4.4 lbs (Avg. Wt.) x 19/100 (% loss pre-weaning) = 4999.3 lbs loss/yr

c. Weaner losses

4844 (weaner pigs/yr) x 28.7 lbs (Avg. Wt.) x 2.6/100 (% weaner loss) = 3614.6 lbs loss/yr

d. Grower/finisher losses

4718 (grower/finisher pigs/yr) x 147 lbs (Avg. Wt.) x 4.2/100 (% grower/finisher loss) = 29128.9 lbs loss/yr

Total Death Loss (add up group losses) = 42582.8 lbs loss/yr

Average Daily Death Loss

42582.8 lbs/yr (total death loss) ÷ 365 = 116.7 lbs loss/day

Annual Sawdust Requirements

42582.8 lbs loss/yr (total death loss) x 0.0037 = 157.56 cu yards/yr

Note: Up to 50% of the sawdust can be replaced by finished compost

Conversion

157.56 cu yards/yr (sawdust requirements) x 0.7645 = 120.5 cu metres/yr

Worksheet #2

Bin Design and Selection for Swine

Bin Volumes

Primary Bin Volume = _____ (lbs death loss/day) x _____ = _____ cubic feet

Secondary Bin Volume = Primary Bin Volume = _____ cubic feet

Bin Wall Height

Bin Wall Height = _____ feet

Floor Areas

Primary Bin Floor Area = _____ cu. ft. ÷ _____ ft. = _____ sq. ft.

Secondary Bin Floor Area = Primary Bin Floor Area = _____ sq. ft.

Select Bin Size

Typical Bin Dimensions: 10 ft. x 10 ft. | 10 ft. x 12 ft. | 10 ft. x 14 ft. | 10 ft. x 16 ft.
12 ft. x 12 ft. | 12 ft. x 14 ft. | 12 ft. x 16 ft.

The bin area you choose should fall between 100 and 200 sq. ft.

Number of Primary Bins

of Primary Bins = _____ sq. ft. ÷ _____ sq. ft. = _____ Bins

Be sure to round up to the next whole number

Number of Secondary Bins

of Secondary Bins = # of Primary Bins = _____ Bins

Alternatively, 1 secondary bin can be used for every 2 primary bins if finished compost is utilized every 90 days (i.e. finished compost is not stored in bins).

Total Number of Bins

of Bins = _____ (# of Primary Bins) + _____ (# of Secondary Bins) + _____ (# of Additional Bins) = _____ Bins

Additional bins can be used for storage of finished compost, sawdust, etc.

Worksheet #2 - Example

Example: Bin Design and Selection for Swine
200 Sow Farrow to Finish Operation

Bin Volumes

Primary Bin Volume = 116.7 (lbs death loss/day) x 20 = 2334 cubic feet

Secondary Bin Volume = Primary Bin Volume = 2334 cubic feet

Bin Wall Height

Bin Wall Height = 5 feet

Floor Areas

Primary Bin Floor Area = 2334 cu. ft. ÷ 5 ft. = 466.8 sq. ft.

Secondary Bin Floor Area = Primary Bin Floor Area = 466.8 sq. ft.

Select Bin Size

Typical Bin Dimensions:

10 ft. x 10 ft.	10 ft. x 12 ft.	(10 ft. x 14 ft.)	10 ft. x 16 ft.
	12 ft. x 12 ft.	12 ft. x 14 ft.	12 ft. x 16 ft.

The bin area you choose should fall between 100 and 200 sq. ft.

Number of Primary Bins

of Primary Bins = 466.8 sq. ft. ÷ 140 sq. ft. = 3.33 or 4 Bins

Be sure to round up to the next whole number

Number of Secondary Bins

of Secondary Bins = # of Primary Bins = 4 Bins

Alternatively, 1 secondary bin can be used for every 2 primary bins if finished compost is utilized every 90 days (i.e. finished compost is not stored in bins).

Total Number of Bins

of Bins = 4 (# of Primary Bins) + 4 (# of Secondary Bins) + 2 (# of Additional Bins) = 10 Bins

Additional bins can be used for storage of finished compost, sawdust, etc.

Worksheet #3

Windrow and Pad Sizing

Windrow Volume

Primary Windrow Volume = _____ (lbs loss/day) x _____ = _____ cubic feet

Secondary Windrow Volume = Primary Windrow Volume = _____ cubic feet

Windrow Height

Windrow Height = _____ feet

A tall windrow generally makes better use of the pad area and sawdust. (5 to 7 feet work best)

Windrow Cross Section

Select the primary cross section from the table below based on the windrow height.

Windrow Height (ft.)	Windrow Cross Section (sq. ft.)
5	30
6	42
7	56

Secondary Windrow Cross Section = Primary Windrow Cross Section

Select Bin Size

Primary Windrow Length = _____ cu. ft (Primary Windrow Volume) ÷ _____ sq. ft. (Primary Windrow Cross Section Area) = _____ ft. (nearest)

If the windrow length is less than twice the windrow height, you do not have enough volume to readily achieve the desired windrow height. Reduce the windrow height and go back to Step 2.

Secondary Windrow Length = Primary Windrow Length

Dimensions of Composting Pad

Pad Length = _____ ft. + _____ ft. = _____ ft.

Select the pad width from the following table

Windrow Height (ft.)	Windrow Width (ft.)	Pad Width (ft)
5	11	52
6	13	56
7	15	60

Worksheet #3 - Example

Windrow and Pad Sizing

Windrow Volume

Primary Windrow Volume = 116.7 lbs loss/day x 20 = 2334 cubic feet

Secondary Windrow Volume = Primary Windrow Volume = 2334 cubic feet

Windrow Height

Windrow Height = 7 feet

A tall windrow generally makes better use of the pad area and sawdust. (5 to 7 feet work best)

Windrow Cross Section

Select the primary cross section from the table below based on the windrow height.

Windrow Height (ft.)	Windrow Cross Section (sq. ft.)
5	30
6	42
7	56

Secondary Windrow Cross Section = Primary Windrow Cross Section

Select Bin Size

Primary Windrow Length = 2334 cu. ft (Primary Windrow Volume) ÷ 56 sq. ft. (Primary Windrow Cross Section Area) = 41.7 or 42 ft. (nearest)

If the windrow length is less than twice the windrow height, you do not have enough volume to readily achieve the desired windrow height. Reduce the windrow height and go back to Step 2.

Secondary Windrow Length = Primary Windrow Length

Dimensions of Composting Pad

Pad Length = 42 ft. + 10 ft. = 52 ft.

Select the pad width from the following table

Windrow Height (ft.)	Windrow Width (ft.)	Pad Width (ft)
5	11	52
6	13	56
7	15	60