

APPENDIX A. :CALCULATING THE AMOUNT OF SUPPLEMENTAL NITROGEN NEEDED (EXAMPLES OF CALCULATIONS)

Sawdust. To incorporate 1 in. of sawdust/acre:

- Sawdust weighs 500 lbs/cu yd (oven dried) - (Davey 1984).
- Sawdust weighs 297 lbs/cu yd (dry) - 500-700 lbs/cu yd (green) - (Bollen 1969).
- Assume 500 lbs/cu yd; 1 in./ac = 134.4 cu yds/ac or 67,200 lbs or 33.6 tons/ac. Suggested rate of N (Bollen, 1969) is 10-20 lbs/ton of sawdust.
- 10 lbs/ton x 33.6 tons = 336 lbs N.
- 336 lbs N = 1600 lbs/ac 21-0-0 (ammonium sulfate) = 1120 lbs of 30-0-0 (ammonium nitrate-sulfate) = 988 lbs of 34-0-0 (ammonium nitrate).

(Note: The characteristics of sawdust, such as percent moisture, weight and C:N ratio vary. According to C.B. Davey, 1984, and Bollen, 1969) The sawdust should be applied early in the spring with split (3 to 5) applications of nitrogen so leaching and ground water contamination is not a threat.

Davey (1984) states:

"Immediate effect 100 cu yds of sawdust at 500 lb dry weight/cu yd = 50,000 lb/ac of sawdust; 50,000 of sawdust added to 2,000,000 lb/ac of soil represents an immediate increase of 2.5% in soil organic matter content. At end of 1 year research has shown that, generally, 2/3 of the sawdust will decompose during the first year and 1/3 remain in the soil; 1/3 of the immediate 2.5% gain represents a 0.8% gain in soil organic matter at the end of the first year. At end of rotation though 90% of the sawdust decomposes during the rotation, 10% remains in the soil; 10% of the 2.5% immediate gain represents a 0.25% gain in the nearly stable fraction of the soil organic matter. This may seem like a small victory, but it is solid progress nonetheless and is much better than can be done with cover or green manure crops."

Mulch. To apply 3 inches of sawdust mulch over 100 square feet, how much nitrogen is needed to decompose the organic material?

1 inch of mulch requires 100-200 pounds of nitrogen per acre with initial mulch application (from Table 7). Therefore, 3 inches of mulch would require 300-600 pounds of nitrogen per acre. There are 43,560 square feet in 1 acre. To find the number of pounds of nitrogen needed per 100 square feet:

$$\begin{aligned} \text{Nitrogen needed} &= \frac{300 \text{ lb}}{43,560} \\ &= 0.0069 \text{ lb/sq ft, or } 1.38 \text{ lb/100 sq ft} \end{aligned}$$

Therefore, 0.069 to 1.38 pounds (or about 1 pound) of nitrogen per 100 square feet should be applied with initial mulch application. Half the amount (or about one-half pound) should be added the second time mulch is applied.