1993

Broiler Litter for Topdressing Tall Fescue

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BROILER LITTER FOR TOPDRESSING TALL FESCUE
Monroe Rasnake and David Watson

A test was started in Princeton in 1991 to observe the response of tall fescue to applications of nitrogen fertilizer and broiler litter. Five treatments were used: two and four tons of litter per acre, 100 lbs nitrogen (half in May and half in July), 100 lbs nitrogen plus soil test recommended rates of phosphate and potash (only 55 lbs of Phosphate applied in 1991) and a check which had no nutrients applied. The treatments began in May 1991 on an established stand of tall fescue on a fragipan soil at the U.K. Research and Education Center in Princeton.

The plots were harvested three times in 1991 and four times in 1992 using a rotary mower with a grass-catcher attachment. Plant samples were weighed green and sub-sampled for moisture determination. Soil samples were taken each spring to follow changes in soil fertility.

Tall fescue yields increased significantly for both nitrogen and litter applications (Table 1). Four tons of litter per acre produced much higher yields of fescue than 100 pounds of nitrogen fertilizer. The total nitrogen supplied by the litter was 150 pounds in 1991 and 200 pounds per acre in 1992. The response to two tons of litter (75 and 100 pounds of total nitrogen in '91 and '92 respectively) was slightly higher than the response to 100 pounds of nitrogen fertilizer. This is probably due to the slow release of nitrogen from the broiler litter which meant more nitrogen was available for full growth of fescue. It was obvious that some nitrogen from the litter was carried over the winter and increased yields of the first cutting in 1992.

Changes in soil test results were also interesting to follow. The effects of the different treatments on soil pH were somewhat surprising (Figure 1). There was a slight decrease in pH in the check plots and even more in the nitrogen fertilized plots -almost half a pH unit. The increase in pH with the four ton litter application was more than expected, especially with the pH starting at 6.7. It may

Table 1. Yield Response* of Tall Fescue to Nitrogen and Boiler Litter Applications

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1991**</th>
<th>1992</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check</td>
<td>1.65</td>
<td>2.34</td>
</tr>
<tr>
<td>100# N/A***</td>
<td>2.38</td>
<td>4.34</td>
</tr>
<tr>
<td>100# N/A</td>
<td>2.37</td>
<td>4.17</td>
</tr>
<tr>
<td>2T Litter/A</td>
<td>2.48</td>
<td>4.97</td>
</tr>
<tr>
<td>4T Litter/A</td>
<td>3.18</td>
<td>7.22</td>
</tr>
</tbody>
</table>

* Tons hay equivalent (12.5% moisture) per acre.
** Only three cuttings in 1991. Plots were established after the grass was cut in May.
*** Received 55 lbs P2O5/A in 1991.
be due to the presence of calcium, sodium and other basic cations in the litter. This indicates that broiler litter can help a lot of our pasture fields that tend to be too acidic for good production.

**Figure 1. Effect of Nitrogen and Broiler Litter on Soil pH**

![Graph showing the effect of nitrogen and broiler litter on soil pH over the years 1991 to 1993.]

The effects on phosphorus levels were also significant (Fig. 2). Phosphorus levels declined in both the check and nitrogen fertilizer treated plots. There was a large increase in soil test phosphorus with the broiler litter treatment. A total of about 380 pounds of phosphate per acre was added by the litter during the two years. This shows that repeated applications of broiler litter could quickly build up the soil phosphorus levels.

Soil test potassium levels also increased with the application of broiler litter (Fig. 3). A total of about 300 pounds of potash was added by the litter in two years. This resulted in about a 100-pound increase in the soil test potassium level. The check treatment caused potassium levels to decrease considerably.

The results of this study indicate that broiler litter can be effectively used on tall fescue in Kentucky. In addition to increasing production, it can help improve soil fertility. It is important to have soils tested on a regular basis to decide where and how much broiler litter to apply.

**Figure 2. Effect of Nitrogen and Broiler Litter on Soil Test Phosphorus**

![Graph showing the effect of nitrogen and broiler litter on soil test phosphorus over the years 1991 to 1993.]

**Figure 3. Effect of Nitrogen and Broiler Litter on Soil Test Potassium**

![Graph showing the effect of nitrogen and broiler litter on soil test potassium over the years 1991 to 1993.]

Extension Agronomist