Nitrogen Loss from Surface Application

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NITROGEN LOSS FROM SURFACE APPLICATION

Research work has shown that considerable nitrogen can be lost from surface applied ammonia-containing fertilizers. The nitrogen is lost due to the formation of ammonia which escapes into the air. Soil and weather conditions encouraging this loss are high temperature, moist soils, high pH and source of nitrogen.

In a laboratory study conducted at the Kentucky Agricultural Experiment Station considerable nitrogen was lost through volatilization from surface application of crystalline urea. This study furnished evidence that volatilization losses of nitrogen from surface-applied urea can be of practical importance under certain conditions. The work indicated that urea topdressed on a moist soil under conditions of high temperature and/or high soil pH would be susceptible to sizeable losses of ammonia through volatilization.

Recent studies at Southern Illinois University show the following losses from surface applications of ammonia-containing fertilizers on bare soil and on clipped fescue sod.

<table>
<thead>
<tr>
<th>Source</th>
<th>Fescue Sod</th>
<th>Bare Sod</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium Nitrate</td>
<td>2.3%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Ammonium Sulfate</td>
<td>4.1%</td>
<td>5.8%</td>
</tr>
<tr>
<td>Nitrogen Solution with Urea (30-0-0)</td>
<td>21.2%</td>
<td>5.8%</td>
</tr>
<tr>
<td>Pelleted Urea</td>
<td>46.4%</td>
<td>17.2%</td>
</tr>
</tbody>
</table>

Air temperature during the study was 74°F.

The nitrogen loss from surface applications is reduced by cool temperatures, dry soil and acid soils.

Where it is feasible to mix the nitrogen fertilizer with the soil, the losses are reduced.

When nitrogen topdressings are to be made in periods of warm weather during the summer months, it is evident that considerable volatilization loss will occur when fertilizers containing urea are applied. This possibility of loss should be taken into account in deciding which fertilizer material should be used for topdressing.

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