Iowa Odor Control Demonstration Project: Soil Injection

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TECHNOLOGY DESCRIPTION

Soil injection controls odor emissions from manure during and after land application. Soil immediately covers the manure during soil injection, isolating it from the air above. Sixteen cooperators are demonstrating soil injection as part of the Odor Control Demonstration Project.

EFFECTIVENESS

Studies in Europe and Iowa, using different evaluation techniques, indicate that soil injection significantly reduces odor during land application.

In Europe, researchers measured the amount of dilution air necessary to reduce the odor to the point at which it is just detectable. Numbers then were assigned to the initial intensity. The higher the dilution “threshold” value, the stronger the initial odor.

European dilution threshold data for different land application methods.

<table>
<thead>
<tr>
<th>Application Method</th>
<th>Odor Dilution Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadcast</td>
<td>2818</td>
</tr>
<tr>
<td>Broadcast &amp; incorporate</td>
<td>130-200</td>
</tr>
<tr>
<td>Untreated</td>
<td>50</td>
</tr>
<tr>
<td>Direct injection</td>
<td>32</td>
</tr>
</tbody>
</table>

In Iowa, attendees of statewide Odor Control Demonstration Field Days evaluated odors on a 4-step scale ranging from no odor (0) to strong (3).
Injecting manure into the soil does increase the cost of hauling manure. According to a survey of custom applicators, using a slurry tanker to inject manure adds about .3 cent per gallon, compared to broadcasting the manure. The increasingly popular “umbilical” drag hose system is often less expensive and is a rapid application method for producers whose land is near their manure source.

Although injection adds to the cost of land application, nutrient savings can offset the extra cost. Using swine pit manure, enough extra nitrogen can be retained to cover the cost difference between injection and broadcasting.