

IOWA Odor CONTROL DEMONSTRATION PROJECT

Soil Injection

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.

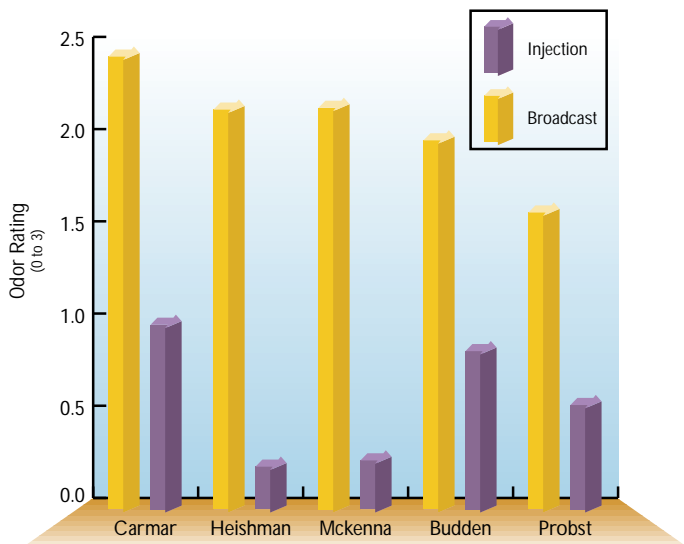
Application Method	Odor Dilution Threshold
Broadcast	2818
Broadcast & incorporate	130-200
Untreated	50
Direct injection	32

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).



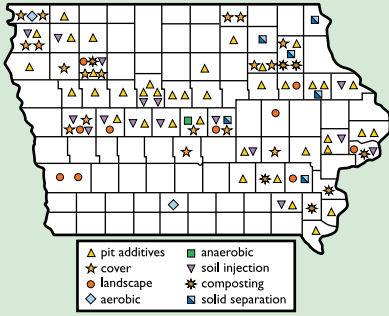
Slurrytanker injecting manure into crop stubble.

Direct Manure Injection Effect on Odor Level



Attendees' evaluation of soil injection effects on odor emission at five field days. (Scale: 0 = no odor, 1 = slight odor, 2 = noticeable odor, 3 = strong odor)

ODOR CONTROL
DEMONSTRATION PROJECT



In 1997, 80 Iowa livestock producers began demonstrating technologies to control odor from animal production. The Odor Control Demonstration Project is administered by Iowa State University and funded by the Iowa Legislature. Participants received up to half of their expenses for the odor-control technologies used on their operations.

Producers with all sizes of operations and all species of livestock were eligible to participate. They could demonstrate one or a combination of the following technologies: aeration, biocovers, composting, landscaping, pit additives, anaerobic digestion, synthetic covers, soil injection, and solids separation.

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FOR MORE INFORMATION

Agriculture and Biosystems Engineering
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OTHER FACT SHEETS IN THIS

SERIES AVAILABLE:

- Synthetic Covers Pm-1754a
- Aeration Pm-1754b
- Biocovers Pm-1754c
- Pit Additives Pm-1754d
- Anaerobic Digestion Pm-1754f
- Composting Pm-1754g
- Landscaping Pm-1754h
- Solids Separation Pm-1754i

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COST

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.



Umbilical system for injecting liquid manure.

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.