MANURE MANAGEMENT AND AIR QUALITY (MMAQ)
EDUCATION PROGRAM
WORKSHOP SERIES

University of Minnesota Extension SERVICE

Biofilter Design and Construction

Biofiltration is one of the most effective and economical means of reducing odor and hydrogen sulfide emissions from livestock and poultry buildings. The use of biofiltration is now gaining popularity in the field and both field research data and neighbor testimonials have validated their effectiveness for odor control. As the industry begins to adopt this technology it is important that both the design and construction of these biofilters is done well.

Researchers at the University of Minnesota have spent significant amounts of time researching, developing, and evaluating biofilter design and construction techniques. These efforts form the core of this educational program.

This intensive one-day workshop with both lecture and hands-on exercises in both the classroom and the field exercises has been designed to provide participants with a thorough understanding of the theory of biofiltration and practical information on design and construction of biofilter systems.

Upon completion of this course the participants will

- Understand the theory of biofiltration
- Understand basic ventilation concepts impacting building ventilation
- Understand the impact of different biofilter media on biofilter design
- Understand the critical criteria of biofilter plenum and duct design
- Be able to design a complete biofilter system for a livestock or poultry system

Who Should Attend?

- Consultants currently in the business of design or construction of biofilters
- Consultants or public employees involved in the promotion of odor control technologies for animal agriculture
- Farmers interested in designing or constructing a biofilter for their facility
- Regulators interested in the design and management features critical to maintaining biofilter efficiency to meet any odor regulations.

Course Instructors:

David Schmidt, MS, Engineer, Department of Biosystems and Agricultural Engineering, University of Minnesota
Larry Jacobson, PhD, Engineer, Department of Biosystems and Agricultural Engineering, University of Minnesota

To register: http://www.manure.umn.edu/workshops
or call 1-800-646-2282

For more information on the course content contact David Schmidt at 612-625-4262 or schmi071@umn.edu

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Detailed Course Agenda
Biofilter Design and Construction

This educational experience will include both classroom education and hands-on exercises. The program will use the following outline.

1. Biofilter Basics
2. Biofilter Media and Evaluation Techniques
    a. What works, what doesn't, and why
    b. All about void space
        i. Impacts on design
        ii. Impacts on treatment effectiveness
        iii. How to measure voids
3. Sizing Biofilters
    a. Ventilation specifications
    b. Amount of media
    c. Area vs depth requirements
4. All about Fans
    a. Pressure vs flow
    b. Types of fans
    c. Sizing of fans
    d. Specifications
5. Ducting Design
    a. Air speeds
    b. Transitions
    c. Evaluation of current designs currently in the field
6. Other Design Considerations
    a. Pumping pits
    b. Rainfall
    c. Rodents
    d. Moisture
7. Management and Maintenance
8. Total System Design
    a. Total ventilation
    b. Partial ventilation

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