

Private Manure Applicator Implementation Study

This Private Manure Applicator Implementation Study report resulted from significant and appreciated input and editing from several individuals. However, the following provided a specific assistance and require special recognition.

Staff from state agencies and the Extension service in surrounding states were critical in providing quality information about their programs. Iowa information was provided by Karen Grimes, Iowa Department of Natural Resources and Angela Rieck-Hinz of Iowa State University Extension. Illinois information was provided by Scott Frank of the Illinois Department of Agriculture. South Dakota information was provided by Kent Woodmansey of the South Dakota Department of Natural Resources and Charles H. Ullery of South Dakota State University.

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Kari Schugel, Kim Von Toft and David Allen of the MDA also worked tirelessly to provide a high quality report. Their efforts are appreciated.

Thank You.

Rick Hansen

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Prepared by Rick Hansen, Minnesota Department of Agriculture,
in accordance with Minnesota Statutes 18C.432, Subdivision 1,
© The commissioner shall report to the house and senate agriculture policy
and funding committees by January 30, 2001.

Executive Summary

The Minnesota Department of Agriculture (MDA), in consultation with the University of Minnesota Extension Service, has reviewed the requirements of Minnesota Statutes 18C.433 in the preparation of the private manure applicator implementation study required under Minnesota Statutes 18C.432. This report fulfills the requirement for the commissioner to report to the house and senate agriculture policy and funding committees by January 30, 2001, with recommendations for training, examination, certification and costs of a private manure applicator manure certification program.

Beginning January 1, 2005, except for a commercial animal waste technician, only a certified private manure applicator may apply animal waste from a feedlot that:

- (1) has a capacity of 300 animal units or more; and
- (2) does not have an updated manure management plan that meets the requirements of pollution control agency rules.

The MDA convened an advisory group to assist in the development of this report. Three meetings were held and the advisory group reviewed programs in from Minnesota and several states.

An estimated 1,400 to 1,800 Minnesota farmers would participate in a private manure applicator certification program. This number was determined from a variety of sources and estimating reduced participation from those farmers who will be required or will choose to implement an updated manure management plan or use a commercial animal waste technician. In addition, following the initial certification, there would not be any new applicator entering the program because of manure management plan requirements under the new feedlot rules.

Therefore, to increase efficiency and effectiveness, it is recommended to adapt existing and similar programs to meet certification requirements. A significant amount of manure management information has already been developed. It is recommended this material be incorporated into a user-friendly electronic delivery system for applicators. This would allow modification of materials and reduce program maintenance costs. Several options and cost estimates are provided.

The certification program should be phased in to ease implementation. One method would be to segment the applicators by size of operation to distribute the implementation workload. This could mean that the larger animal unit facilities would certify first and the smaller later. The training and testing materials should be developed prior to January 1, 2004.

The MDA intends to continue development of the certification program with potential program participants and interested parties in anticipation of the 2005 requirement. The evaluation of other state programs and experience shows that sufficient funds will be necessary to enable program initiation and maintenance prior to 2005.

Gene Hugoson
Commissioner

Introduction

The purpose of this study, fulfilling the requirements of Minn. Stat. 18C.432 (2000), is to provide recommendations to the Legislature for training, examination, certification and costs for a private manure applicator certification program. The Legislature has already determined that a private manure applicator certification program will be implemented on January 1, 2005. Farmers with feedlots with a capacity of 300 animal units or more and do not have a manure management plan that meets the requirements of a Minnesota Pollution Control Agency rules would need to become a certified private manure applicator.

The Minnesota Department of Agriculture (MDA) convened an advisory group of stakeholders to provide advice and comments in the development of the recommendations. The advisory group met on November 9 and December 15, 2000 and January 11, 2001. The following participated in at least one meeting in the advisory group process:

<i>Stakeholder</i>	<i>Representing</i>
Gene Anderson	University of Minnesota Extension Service
Lisa Behnken	University of Minnesota Extension Service – Olmsted County
Dennis Busch	University of Minnesota Extension Service
Bill Crawford	University of Minnesota Extension Service – Martin County
John Curry	Minnesota Center for Environmental Advocacy (MCEA)
Derek Fisher	Board of Water & Soil Resources (BWSR)
Glen N. Graff	Minnesota Cattlemans Association
Rick Hansen	Minnesota Department of Agriculture
Mark Hoeft	J & M Waste (Liquid Pumpers Association)
Scott Hoese	Minnesota Association of SWCDs (MASCWD)
Bob Koehler	University of Minnesota Southwest Research & Outreach Center
Phil Nesse	University of Minnesota Extension Service
Dave Preisler	Minnesota Pork Producers Association (MPPA)
Craig Sallstrom	Certified Crop Advisor Association (CCAA)
David Schmidt	University of Minnesota Extension Service
Wayne Schoper	University of Minnesota Extension Service – Brown County
Joe Spitzmueller	Minnesota Department of Agriculture
Jeff St. Ores	Natural Resources Conservation Service (NRCS)
David Wall	Minnesota Pollution Control Agency
Karen Zimmerman	Minnesota Turkey Growers
<i>* Additional groups were contacted and provided input and comment.</i>	

The MDA also reviewed similar certification programs in the states of Illinois, Iowa and South Dakota. A draft copy of the report was provided to the Feedlot Manure Management Advisory Committee for review following their January 18, 2001 meeting.

The first step the MDA and advisory group took in preparing recommendations was to determine how many farmers would be included in the program. The second step was to look at certification programs in other states, and to assess similar programs within Minnesota.

Minn. Rules Ch. 7020.2225. Subp.4 (A.) (2) indicates who must prepare a manure management plan,

“an owner of an animal feedlot capable of holding 300 or more animal units that is not required to obtain an NPDES, SDS, interim or construction short-form permit shall prepare and update a manure management plan prior to January 1, 2005, when a manure management plan does not meet the requirements of this part or reflect current operations and the manure is applied by someone other than a commercial animal waste technician or a certified private manure applicator;”

Because feedlot owners with greater than 1,000 animal units (AU) are required to have a manure management plan, the potential participants in a private manure applicator certification program are those persons applying manure from feedlots with between 300 and 1,000 AU who do not have a manure management plan. In addition, any feedlot operator upgrading their facility will be required to have a manure management plan and will therefore not need certification or recertification. This means there will not be any new participants in the certification program after the initial implementation.

The feedlot operations who will seek to become certified include a fraction of those operations with between 300 and 1,000 AU. Facilities with 1,000 or more animal units are required to prepare a manure management plan in accordance with MPCA requirements and therefore will not need private certification. Facilities with less than 300 AU do not need certification. To estimate the total number of feedlots with between 300 and 1,000 AU, we examined MPCA permit numbers and the 1997 US Census of Agriculture. In addition, some counties may require manure management plans at less than 300 AU, therefore certification would not be required.

Estimating potential participants is difficult. There are several conflicting analyses of numbers. Based on their experience, the advisory group estimates there will be between 1,400-1,800 farmers who would be potential participants in a private manure applicator program. This number was based upon an estimate of **4,000** feedlots between 300 and 1,000 AU, minus those who would complete a manure management plan, hire a commercial animal waste technician or would no longer be in business on January 1, 2005.

Between 1978 and 2000, the MPCA issued 2,114 permits for operations with between 300 and 1,000 AU. Counties have also issued many permits (not tabulated) for feedlots with between 300 and 1,000 AU, but this information has not been tabulated. A very rough estimate of the total number of facilities between 300 and 1,000 AU that have been issued MPCA permits is **3,000**. We assume that most feedlots within this size category have obtained a permit. Few feedlots of this size have gone out of business since the permit was issued. The MPCA numbers are likely to be a conservative estimate.

The MDA's Feedlot Financial Needs Assessment Report required under Minn. Session Law 2000 Ch. 435, Sec. 11 has provided this analysis. It is based on the 1997 US Census of Agriculture and concludes there were an estimated 40,000 farm operations with livestock in Minnesota as of December 31, 1996. This database had an estimated 80% response from all operations that had more than \$1,000 in farm related income and at least one head of the reported livestock species. The census data collected as of December 31, 1996, was expanded by the USDA to estimate statewide numbers. US Census of Agriculture reporting is mandatory under federal law, however the accuracy of the data is dependant on the honesty of the reporting farmer. It is also recognized that some of the responses may have been incomplete or misleading. Despite its limitations, the US Census of Agriculture data is the most credible to use at the present time. However, based on data derived from the 1997 US Census of Agriculture, the total number of feedlots in 1997 with between 300 and 1,000 AU is **1,259**. Each estimate has limitations.

The data on the number of feedlots between 300 to 1,000 AU should be re-evaluated when the feedlot registration process is completed in 2002 to determine a more accurate number of potential private manure applicator certification program participants.

<i>Number of Feedlots by Animal Unit (AU) Size and Species in Minnesota on 12/31/96</i>			
Species*	300-499 AU	500-999 AU	Total
Hogs	592	425	1,017
Dairy	55	24	79
Cattle	25	12	37
Poultry	72	51	123
Sheep	3	N/A	3
Total	747	512	1,259

** 1997 Census of Agriculture*

The US Census of Agriculture numbers are likely to be conservative assessment if applied to today. As a comparative example, the MDA conducts a Dairy Farm Count; a standing inventory of the number of dairy farms. The following is a comparison of this data.

<i>MDA Dairy Farm Count Comparison</i>			
Dairy Comparison	300-499 AU	500-999 AU	Total
2001 MDA Dairy	204	94	298
1997 US Census	55	24	79

With the feedlot trends indicating an increase in AU and additional data currently showing a greater number of feedlots in these AU categories it is likely the potential pool of participants is greater than indicated on December 31, 1996. A better estimate would be to project that the total number of feedlots between 300 and 1,000 AU would be 4,000 on December 31, 2004. It is estimated many of these operations will not need private certification since:

- a) Approximately 10% will need to obtain an interim feedlot permit prior to 2005 due to pollution hazards, thus requiring a manure management plan.
- b) Approximately 10% will need to obtain a construction short form permit due to construction or expansion activities prior to 2005, thus requiring a manure management plan.
- c) Approximately 15% will choose to develop a manure management plan on their own without being required to obtain a permit.
- d) Between 30% to 40% will hire a licensed commercial animal waste technician for all manure application.

If it is assumed 60 to 70 percent of the estimated 1,259 to 4,000 feedlots with 300 to 1,000 AU will not need private certification for the reasons above, then the estimate of 1,400 to 1,800 people participating in a private manure applicator certification program is possible.

This report will provide a description of several program models. In addition, an analysis of assumptions and challenges is provided. Finally, a series of recommendations are listed and an Appendix of applicable information is included.

Review of Similar Programs in Minnesota

Certified Crop Advisor Model

The Certified Crop Advisor (CCA) program is privately operated certification developed by the American Society of Agronomy, a professional organization. Testing and training approval is administered by a private, independent Board which is composed of various non-governmental and governmental entities. A description of the CCA program is provided in the Appendix on pages 31-33. Training is approved by the Board on a Continuing Education Unit (CEU) system. This “recertification” training is required to maintain certification. Administration costs are borne by the private Board through certification fees paid by the certified advisors. The CCA is a voluntary program that farmers could participate in now. To adapt this model to meet the need of 1,400 to 1,800 private manure applicators, the following would need to be done:

- A. Private, Independent Board
 - 1. Determine/develop private, independent entity to administer program;
 - 2. Establish program authority and structure; and
 - 3. Implement operating structure.

- B. Manuals
 - 1. Determine performance objectives that can be met from various sources sufficient to demonstrate knowledge by private manure applicators;
 - 2. Provide performance objectives;
 - 3. Determine performance areas. The CCA has four competency areas: nutrient management, pest management, soil and water management and crop production.

- C. Testing
 - 1. Develop a test based on performance objectives;
 - 2. Establish testing workshops twice a year; and
 - 3. Validate tests based on performance area.

- D. Certification
 - 1. The test itself is not the only criteria for certification;
 - 2. Experience is also required for certification (depends on formal education: minimum 2 years/ maximum four);
 - 3. An initial exam fee (CCA has \$100 for international and \$75 for state);
 - 4. Certification expires on December 31 of year after initial certification;
 - 5. An annual renewal fee of \$45 for certification; and
 - 6. Private Board responsible for certification administration;

- E. Recertification
 - 1. Continuing education must meet performance objectives
 - 2. Approved by Board
 - 3. CEU attendance is monitored by the presenter of the class.

- F. Ethics Component
 - 1. Board monitors compliance to Code of Ethics which the CCA has agreed to; and
 - 2. Administrative remedy to ethics challenges.

- G. Cost
 - 1. Board contracts with Minnesota Crop Production Retailers (MCPR) to accomplish administration;
 - 2. >1 FTE; and
 - 3. In-Kind support from Board members.

Private Pesticide Applicator Model

The private pesticide applicator certification requirement was established with a federal mandate in the mid-1970s. A collaborative process was institutionalized with a federal cooperative agreement and state statute where the MDA was responsible for certification and the UMES for training. There are currently 23,500 certified private applicators. Federal funds help support the program.

The private applicator program was initially implemented with only workshop attendance. There was no exam. Testing was added several years later. The test is open-book and acts as the certification. Exams are distributed at Extension offices or at Extension workshops. A sample of the exam information is provided in the Appendix on pages 29-30. There are other statutory requirements for the certification including a \$10 fee and a three-year term. Recertification requires taking the test again. Workshops are voluntary, must be three hours in length and are conducted by Extension. A list of these workshops can be found at <http://www.extension.umn.edu/pesticides/pat/mnpat.html>. Extension has the discretion to charge additional fees to pay for training/manual development. Currently the discretionary training fee is \$25.00.

Adapting this model to meet the needs of 1,400 to 1,800 private manure applicators would need to be done by:

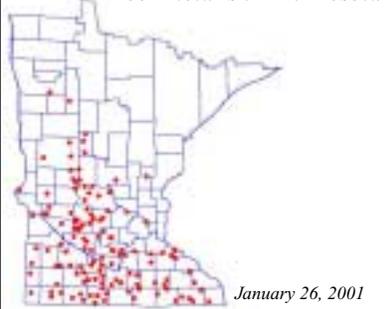
- A. Manuals
 1. Determine if Commercial Animal Waste Technician (CAWT) manual(s) are sufficient for use by private manure applicators;
 2. Implement Extension mechanism for the manual(s); and
 3. Provide funding to update the content manual(s) to include current information and regulations.
- B. Testing
 1. Extension would prepare and score test;
 2. Extension would conduct voluntary training and testing; and
 3. Take home, open-book tests would be available at Extension offices;
- C. Certification
 1. Test serves as certification;
 2. \$35 certification/training fee for three year time period with certification expiring on March 1 after third year;
 3. MDA responsible for certification administration;
- D. Recertification
 1. Test serves as recertification;
 2. Workshops are voluntary (not required for recertification)
 3. Voluntary workshops conducted by Extension (no approval/monitoring process).

Commercial Animal Waste Technician Model

The CAWT requirement was established in 1998 with a one-time appropriation of \$107,000 from the Legislature. The implementation date for the requirement was March 1, 2000. The estimated number of licensees when established was 200. Currently 300 are licensed. An advisory committee was established and a \$54,000 contract was established between the MDA and UMES to create study materials. The advisory committee recommended two categories: Liquid and Solid. Two manuals were created. Of these approximately 800 copies of the Liquid and 400 copies of the Solid manuals remain. A description of the CAWT program, and a list of CAWT's can be found at <http://www.state.mn.us/APPD/CAWT>.

The CAWT license was implemented through testing at workshops held prior to March 1, 2000. The workshops were not mandatory, but provided an efficient opportunity for applicators to get licensed. The CAWT exams are open-book, but monitored. Monitoring is required to ensure the person taking the exam is not being assisted.

Licensed Commercial Animal Waste Technicians in Minnesota



January 26, 2001

The exam acts as the certification. Other statutory requirements for the license include financial responsibility, a \$50 fee for a three-year license term. The CAWT advisory committee recommended the recertification requirements to be participation in an approved workshop for two of the three years of licensure. A list of approved CAWT workshops can be found at <http://www.mda.state.mn.us/APPD/CAWT>.

The following chart is an explanation of costs for the development of CAWT training materials by the University of Minnesota Extension Service. Similar costs would be required of a traditional manual was prepared for private manure applicators.

University of Minnesota Extension Service CAWT Contract

Manual development costs in addition to salary and miscellaneous expenses

UMES Expenses	Item	Cost
Printing	1,900 Liquid Manuals	\$5,174
Printing	1,400 Solid Manuals	\$3,808
Printing	Informational Materials	\$1,820
Postage	Manual Distribution to County Extension	\$695
Postage	Distribution of Manuals	\$1,459
Advisory Group Meetings	UMES Expenses	\$558

Following initial testing prior to March 1, 2000, testing has been available via compact disc at many county extension offices and other locations. A list of locations can be found at <http://www.mda.state.mn.us/APPD/CAWT>. To adapt this model to meet the needs of 1,400 to 1,800 applicators the following would need to be done:

- A. Manuals
 - 1. Determine if CAWT manuals are sufficient for use by private manure applicators;
 - 2. Are Categories (Liquid and Solid) needed;
 - 3. Implement MDA distribution mechanism;
 - 4. Provide funding to update the content manual(s) to include current information and regulations.

- B. Testing
 - 1. Determine if existing CAWT exam content is appropriate for private applicators;
 - 2. Establish testing workshops throughout state to serve 1,400 to 1,800 applicators;
 - 3. Collaboration between MDA, Extension and other entities to provide testing;
 - 4. Establish tests at locations to provide additional testing opportunities after implementation; and
 - 5. In-Kind cooperation with Extension and other entities to provide on-going testing.

- C. Certification
 - 1. Exam serves as certification;
 - 2. \$50 certification fee for three year time period; certification expires on December 31 of third year;
 - 3. MDA responsible for certification administration;

- D. Recertification
 - 1. Attend appropriate workshop two out of three years of license; or
 - 2. Retest

Commercial and Noncommercial Pesticide Applicator Model

The Commercial and Noncommercial pesticide applicator certification requirement was established with a federal mandate in the mid-1970s. Federal funds help support the program. A collaborative process was institutionalized with a federal cooperative agreement and state statute where the MDA was responsible for certification and licensing, and the UMES for training. There are currently more than 7,000 Commercial and Noncommercial pesticide applicators licensed each year in Minnesota.

The Commercial and Noncommercial pesticide applicator program was implemented with self study manuals and a closed book, monitored exam. The tests are administered at MDA offices. There are other statutory requirements for the certification including proof of financial responsibility and workers' compensation insurance when applicable. Recertification is required and it is accomplished by either attending a recertification workshop or taking correspondence study courses. Annual workshops are 4-6 hours in length. Agricultural workshops occur every 3 years and are 6 hours in length.

To adapt this model to meet the needs of 1,400 to 1,800 applicators the following would need to be done:

- A. Manuals
 - 1. Determine if CAWT manual(s) are sufficient for private manure applicators
 - 2. Determine what revisions, if any, need to be made to the manual(s)
 - 3. Contract with UMES to revise the manual(s)
- B. Testing
 - 1. MDA would prepare and score exams
 - 2. Testing locations in St. Paul and MDA field staff and County Ag Inspectors
- C. Certification
 - 1. MDA would issue license upon passing exams
 - 2. Certification expires on December 31 every year
- D. Recertification
 - 1. Recertification workshops with monitored attendance. Workshops could be required once a year for 4-6 hours or every three years for six hours.
 - 2. Develop a correspondence study course and exam for those who are unable to participate in a workshop.
 - 3. Require retesting with the original exam.

Minnesota Pork Producers Environmental Workshop Model

The Minnesota Pork Producers Association has conducted Environmental Assurance Program training for several years. The mission of the Pork Industry's Environmental Assurance Program is to provide pork producers practical, proactive educational information which enables them to identify and economically address the key management issues affecting the environmental quality of their operation and their communities.

Making sure your business techniques are environmentally sound is critically important to the success of your business. That's why the National Pork Producers Council developed the Environmental Assurance Program—to help producers and the industry successfully meet the environmental challenges of today and tomorrow.

Because of uncertainty regarding the failure of the pork checkoff referendum, the Minnesota Pork Producers were unable to provide information on their Environmental Assurance Training Program.

A description of the National Pork Producers "Environmental Assurance Program" can be found at <http://www.nppc.org/PROD/EnvironmentalSection/envassuranceprogram.html>.

Review of Other State's Programs

Illinois

Illinois Certified Livestock Manager

The purpose of the Illinois certified livestock manager program is to enhance the management skills of producers in critical areas; such as environmental awareness, safety concerns, odor control techniques & technology, neighbor awareness, current best management practices, and developing and implementing manure management plans.

The Illinois Department of Agriculture (IDA) conducts certification. IDA receives general tax funding to operate the program. It contracts with Illinois Extension Service to conduct the training at an approximate annual cost of \$45-50,000. This contract provides for manual development and training. The manuals are currently traditional paper manuals, however, an on-line training session with a quiz is scheduled to begin in the near future.

Certification

The Illinois certification program started in 1997. The cost for the three year certification is \$10 paid to the IDA. Some facilities brought several employees to the training. In subsequent years, the number certified has decreased. In 2000, the first cycle to recertify, fewer persons recertified. The web site for the program is: <http://clmt.outreach.uiuc.edu>. A copy of the Illinois statute is included in the Appendix on page 34. For more information on the Illinois program, contact Scott Frank at 217-785-2427.

Training

For the producer, there is a \$10 charge for the training (paid to Extension) and the manual costs \$26.50, which includes shipping and handling. The IDA is responsible for the examination, which is based on the manual. IDA has the ability to approve training programs, but currently only Extension is conducting training. An example training is included in the Appendix on pages 35-36.

Iowa

Certification

The Iowa certification program is administered through the Iowa Department of Natural Resources (IDNR). The certification fee is \$50. The IDNR contracts with Iowa State University Extension to develop training materials and to conduct training sessions. To become certified, a confinement site applicator must pass an exam or attend training. A fact sheet on the certification program is provided in the Appendix on pages 38-39. For further information, please contact <http://www.state.ia.government/dnr/organiza/epd/index.htm>.

Iowa Certification Numbers for 1999, 2000

	# Commercial		# Confinement		Total Certified	Income Received	Gross Revenue
Date	trained	certified	trained	certified			
1999	984	847			847	42,350	42,350
1999			1,828	1,398	1,398	69,900	23,300
Total					2,245	112,250	65,650
2000	804**	610			610	30,500	30,500
2000			1,192*	235 new	235	11,750	3,917
Total					845	42,250	34,417
Projected Annual Income							50,024

This number includes 105 training sessions for confinement site applicators, including 26 initial, 76 renewals and 3 unknowns.

**This number is the number of folks who filled out an evaluation form.

For more information regarding certification contact Karen Grimes at 515-281-5135 or email Karen.Grimes@dnr.state.ia.us.

Training

Satellite training sessions are conducted at Extension offices throughout the state in February. From January through March, Extension livestock specialists or agronomists conduct private (confinement site) applicator training in most of Iowa's 100 counties. Video tapes are made from the satellite downlink so that new or renewing applicators who missed the courses can watch a video to become certified. While not ideal, this flexibility was needed to meet the needs of commercial firms who hire part-time workers throughout the calendar year. It also accommodates private applicators who can't attend the scheduled local training. A three-hour and two hour video is made from this session for training of commercial and confinement site manure applicators, respectively. Training packets are available for \$20. To renew every three years, they must pass an exam or attend three hours of continuing education. The contract from IDNR to Extension averages about \$75,000 per year. A complete summary of expenses for the Iowa State University training is listed in the Appendix. For a complete listing of training opportunities, please contact the Iowa Manure Management Action Group (IMMAG) web site <http://extension.agron.iastate.edu/immag>. For more information on training contact Angie Rieke-Hinz at 515-294-9590.

South Dakota

Training

South Dakota began a training program in 1997, which was sponsored by the South Dakota Pork Producers Association. Swine producers with permits had to submit verification of training by December 12, 1997. That was the cutoff date for verification to receive a certificate of compliance. After the initial training for pork producers, the South Dakota Department of Environment and Natural Resources began issuing permits for feedlots with animals other than swine. Next, the South Dakota Extension Service began sponsoring the training program. Approximately 440 people have attended the training since it began. An allocation of \$20,000 was provided to the South Dakota Extension Service to prepare an educational packet.

An example of the South Dakota training program is provided in the Appendix. The producer shall participate in an approved environmental training program pertaining to proper operation and maintenance of a manure management system and proper management of natural resources. Anyone wishing to provide an approved training program must submit an outline of the training program to the Secretary for approval.

Upon request, the Secretary will provide producers with a listing of approved environmental training programs. By January 1, 1999, any producer that is covered under the permit shall submit verification that the producer has taken this training. Effective January 1, 1999, the producer must submit this verification with the Notice of Completion required in South Dakota Stat. Section I.B.2.c. on page 7. The Secretary will not provide a certificate until this verification is received.

Comparison of State Programs						
State	Certification Fee	Initial Certification	Study Material Fee	Recertification	Workshop Fee	Number Licensed
Illinois	\$10	Test or Training	\$26.50	Test or Training	\$10	3,715
Iowa	\$50	Test or Training	\$20	Test or Training		1,633
South Dakota		Training		Training	\$25	440

For more information about the South Dakota training program, contact Charles H. Ullery at 605-688-5141. A description of training materials developed is provided in the Appendix on page 42.

Assumptions and Challenges

An estimated range of 1,400 to 1,800 farmers could participate in the private manure applicator certification program. The advisory group has reviewed the certification program as developed by the Legislature in Minn. Stat. 18C.433 (2000).

Under Minn. Stat. 18C.432, the components to consider are: 1) Training; 2) Examination; 3) Certification; and 4) Costs.

Training

Training is already somewhat defined in Minn. Stat. 18C.433: 1) it *may* be done in cooperation with other government agencies; and 2) it *must* be at least three hours in duration. In Minn. Stat. 18C.432 the training authorities and responsibilities are more specifically defined: 1) MDA *shall* develop, in conjunction with the University of Minnesota Extension Service...; 2) MDA *shall* appoint planning committees...; 3) specific regulatory concerns must be discussed...; and 4) MDA may approve programs from private industry ...that meet minimum requirements.

Training methods have been divided as several types:

1. *Initial Training* is needed to prepare to pass a certification examination. This training would be designed to meet specific learning objectives, which would reflect minimum competency needed to perform job tasks and pass a certification examination.
2. *Continuing Education Training* is required to provide new information following the examination. This training would build upon the exam's minimum competency by providing additional information. The continuing education could be used as a recertification requirement.
3. *Training As Certification* is used to provide the minimum competency through training with no examination. Participation as certification (or recertification) without measurement.

A. Initial Training to Prepare for an Exam

Initial training is voluntary for the private pesticide applicator model. Approximately 40% of certified private applicators use this formal vehicle to help them become certified. If initial training occurs, it is at least 3 hours in length. This classroom session can also serve as a recertification training because certification does require an open book examination every three years. Both new and renewing applicators may attend the same workshop. County Extension educators throughout the state deliver the workshops during the months of January, February and March. The voluntary workshops are conducted at no registration cost to the farmer.

An Extension infrastructure currently exists to deliver the private pesticide applicator training. The training is a job component of many county Extension educators and development and implementation costs are borne as in-kind. Several advisory group members indicate a structure currently exists to deliver a manure applicator program.

The private pesticide applicator model also allows informal training prior to examination through self-study of the training manual. The manual is developed and distributed by the University of Minnesota through cost-recovery and in-kind costs. Manual printing is funded by the MDA through the pesticide regulatory account. The manual contains topics to be included on the certification examination.

The private pesticide applicator pays a \$10 certification fee to the MDA and a \$25 training fee to the University of Minnesota Extension Service. The \$25 pays for the cost recovery and administration of the training and testing and the \$10 pays for implementation of the certification program. The relatively low cost to the farmer is based on the relatively large number of participants. In addition, the number of participants has been distributed throughout the three-year cycle over the program's lifetime. The private pesticide applicator statutory language (Minn. Stat. 18B.36 [2000]) is similar to that found in Minn. Stat. 18C.433.

The challenges to applying the private pesticide applicator model to a private manure applicator program are as follows:

- There are nearly 10 times as many potential participants in the private pesticide applicator program than would be in the private manure applicator program;
- The delivery costs may be greater as current Extension infrastructure is not comparable;
- The customer service will be difficult, as fewer participants would increase distance and cost of classroom training effort.

The advantages to the private pesticide applicator model are:

- Farmers are familiar with this program format;
- Informal, self-study training is allowed as preparation for the certification examination;
- Electronic media could be used for informal, self-study. For example web based, Internet, CD-ROM or video training are new delivery methods available for education;
- Initial costs for informal, self-study are short term and they produce training materials that can be used numerous times.

The commercial pesticide applicator and CAWT programs are somewhat similar. There is no formal, classroom initial training. Informal, self-study with manuals is the method used for preparation in taking the examination(s). The MDA has received requests from some sectors of the commercial pesticide program for initial, formal classroom training for new employees.

The certified crop advisor program does not have formal initial training, but does have informal training through self-study materials to prepare for the certification examination.

B. Continuing Education Training Following an Exam

This training is often used to maintain or renew a certification. As mentioned before, the private pesticide applicator program considers initial training and continuing education the same, as they are both voluntary and used to prepare for the examination. The exam determines minimum competency.

For commercial pesticide applicators and CAWT, the continuing education is a required formal, classroom training. It delivers additional information to the participant beyond the minimum competency they received through testing. Attendance is monitored by MDA to ensure full participation. This increases implementation costs.

Commercial pesticide applicators in agricultural crops categories (Ag Herbicide, Ag Insecticide/Fungicide) need to attend a six-hour formal workshop once every three years. In general, the University of Minnesota Extension Service has conducted the formal, classroom training for 2,150 applicators on a cost recovery basis with a \$60/65 registration fee per applicator. This is comparable to the potential number of private manure applicators. The training occurs in a three-year cycle in regions throughout the state, southern, middle and northern regions. This training cycle would be difficult to apply to a new program without a phased in implementation. [It should be noted that annual correspondence study continuing education is available in some commercial pesticide applicator categories.]

The challenges in applying the commercial pesticide applicator model to a private manure program are as follows:

- Greater fees for training than the farmer may be used to paying;
- Difficult to initiate cycle for consistent delivery of training; and
- Potential participants are distributed throughout the state, making it difficult to economically provide training at a cost which participants would accept.

The advantages to the commercial pesticide applicator model are:

- Provides additional information beyond minimum competency;
- Classroom training allows group interaction and sharing of experiences;
- Allows updates and delivery of new information from speakers that are experts in their field;

- Training could be incorporated into livestock group’s annual meetings to reduce duplication of efforts and reduce time away from the job;
- Electronic media could be used for informal, self-study for “correspondence study option”.

The certified crop advisor program does have continuing education training through a Continuing Education Unit (CEU) system. Once certified, persons must attend 40 hours of CEUs in competency areas every two years. The state CCA board approves the CEUs and the sponsoring organization maintains the attendance list.

C. Training As Certification

Training For Certification is similar to how the private pesticide applicator program began over 20 years ago. Certification would be accomplished by attending a formal, classroom-training event. There would be no examination. This could be allowed provided that MDA approve agendas from private industry and organizations to ensure content requirements are met.

Training would be classroom-type education that farmers could participate in to obtain certification or recertification. A certificate could be provided upon completion of the training. The process for training approval is defined in statute.

The commercial pesticide, commercial animal waste, and certified crop advisor programs use this system for recertification. The model has been adapted over time to include testing in the private pesticide applicator program. It could be a relatively efficient method for encouraging initial program participation.

The challenges in applying this model to a private manure program are as follows:

- Cost for monitoring attendance;
- Potential variability in program quality;
- Adaptability or applicability of programs for different farmer needs throughout the state; and
- No assurance or measurement that participants gained knowledge because there is no examination - no measurement

The advantages to this model are:

- Could utilize existing delivery systems and events;
- Administrative costs may be lower without an examination; and
- Some farmers are familiar with some existing programs.

The various training options provide several opportunities and methods for delivering high quality manure management information. The advisory group has indicated that current educational programs could provide formal, classroom and informal, self-study training. An example is the USDA and EPA have prepared the “Livestock & Poultry Environmental Stewardship: A National Education Program for Producers”. A description of this program is provided in the Appendix on pages 43-44. Numerous, different manure applicator educational materials have been developed and distributed from a variety of sources during the past several years (see Appendix, pages 45-48). They would need to be modified to meet certification requirements.

Examination

The use of examination is described in Minn. Stat. 18C.432. Subd. 2 (2000). “Training manual and examination development. The commissioner, in conjunction with the University of Minnesota Extension Service, shall continually revise and update manure applicator training manuals and examinations. *Questions in the examinations must be determined by the commissioner.* Manuals and examinations must include manure management practices that discuss prevention of manure occurrence in waters of the state.”

Examinations could be conducted through several methods. The statute states questions must be determined by the commissioner. This could occur in several ways.

1. *Closed book and monitored* exams are conducted in the commercial pesticide applicator program. Questions are based on the study materials where learning objectives are identified to determine minimum competency. Closed-book examination determines knowledge retention and monitoring reduces cheating.
2. *Open-book and monitored* exams are conducted in the commercial animal waste technician program. Questions are based on the study materials where learning objectives are identified to determine minimum competency. The open-book examination allows the use of the study materials during the examination. Monitoring ensures that each applicator completes his/her own examination.
3. *Open-book* exams are conducted in the private pesticide applicator program with no monitoring. Questions are based on the study materials where learning objectives are identified to determine minimum competency. The open-book allows the use of study materials during the examination and can encourage collaborative problem solving in a testing setting. This type of exam is also used for recertification in the commercial pesticide applicator program and is called “correspondence study”.
4. *Timed* exams are used in some states (Wisconsin) to set a limit on the time allowed to complete an examination. This can improve the administration and efficiency of testing. The private pesticide, commercial pesticide, and CAWT exams are not timed.

The examinations in each of the models are primarily multiple choice questions derived from the study materials. Some true and false questions may be included. The private pesticide exams have 50 questions. The commercial pesticide exams range from 50 questions to 100 questions, and the CAWT exams have 100 questions. The answers are completed on a “bubble-sheet” that is used in machine scoring. These types of tests are easier to administer. Exams are scored at central locations by staff who are trained for and assigned the testing responsibility. The University of Minnesota Extension Service scores the private pesticide applicator exams and the MDA scores the commercial pesticide applicator and commercial animal waste technician exams.

If commercial pesticide applicators and CAWT do not participate in continuing education training, the examination is used as a method of recertification. If commercial pesticide applicators miss the recertification workshop they must take a closed book test and are charged a retest fee equal to the cost of the workshop. There is no retest fee for CAWT.

The exam questions are printed in a paper booklet and a separate answer sheet is completed by the applicator. The answer sheets are scored at a central location. With the MDA exams, commercial applicators are notified of their scores if they fail the test. If they pass the examination(s) and meet all of the requirements, they receive the license. In the development of the commercial animal waste technician exam(s), a pilot electronic version of the exam was developed from a pool of questions derived from the study materials. An applicator could take the exam at a computer station at a testing location. The exam is on CD-ROM and the answers are written to a disc. The data is scored at the end of the exam and provided to the MDA.

Certification

Certification is defined in Minn. Stat. 18C.433. Subd. 2 (a) (2000) “the commissioner shall prescribe certification requirements and provide training...” Certification would be the formal method of identifying or validating compliance with identified requirements. For pesticide applicators, training requirements are defined in Minn. Stat. 18B.305. Subd. 1 (a) (2000) “The commissioner shall develop, in conjunction with the University of Minnesota Extension Service, innovative educational and training programs addressing pesticide concerns including:

1. Water quality protection;
2. Endangered species;
3. Pesticide residues in food and water;

4. Worker protection;
5. Chronic toxicity;
6. Integrated pest management; and
7. Pesticide disposal.”

The topics listed above are not entirely appropriate for manure applicator certification requirements, but the following suggestions may be:

1. Manure as a resource;
2. Manure, the environment; and human health;
3. Safety;
4. Manure management planning;
5. Application methods and rates;
6. Preparing for and responding to incidents;
7. Recordkeeping, rules and regulations; and
8. Stockpiling/composting.

There are several administrative options for delivering a private manure applicator certification program.

A. *Administrative Options With An Examination:*

1. *Minnesota Department of Agriculture* would be responsible for conducting certification. The MDA would prepare and conduct the examinations. It would process the application and fee. It would issue the certification to the applicant. This would be similar to the CAWT and commercial pesticide applicator licenses.
2. *University of Minnesota Extension Service* would be responsible for conducting certification. The University would prepare and conduct the examinations. It would process the application and fee and issue the certification to the applicant.
3. *A Combination* would involve a partnership between the MDA and UMES, where responsibilities would be shared and tasks defined. With the private pesticide applicator program, the UMES prepares and conducts the examination. It processes the application and fee and issues a temporary certification. Data is then sent to the MDA to issue the formal certification.
4. *A Private Sector or Association* would issue the certification when delegated the responsibility by the state. One or more entities could be approved to confer certification according to approved criteria. This would involve preparing and implementing the examination. The application and fee would be determined by the entity conducting certification. This method is currently used by the Certified Crop Advisor (CCA) program.

B. *Administrative Options Without Examination:*

1. *Planning Committee Approves Workshops* that meet certification requirements. The planning committee is convened by the MDA and includes the UMES and interested parties. Workshops are approved and promoted for certification. Workshops may be sponsored by Extension or other training providers. Participation is monitored by a designated responsible party and attendance verified for certification.
2. *Workshops Are Required for Initial Certification and Recertification* would be similar to the optional Iowa and Illinois certification programs. In these states, workshops are conducted every year of the three-year certification or every three years for the purpose of obtaining and maintaining certification.
3. *Applicators Are Responsible* for participating in formal, workshop training and maintaining certification.

The opportunity is great for use of technology to assist in the delivery of a new manure applicator program. Existing

programs have been established over a period of time and are not as adaptive to implementing new technologies. The current private pesticide applicator program could streamline administrative responsibilities.

The UMES is currently able to offer on-line training, electronic enrollment and credit card payment options for training. The MDA does not. The UMES could develop a manual in paper and electronic formats, prepare an electronic application, payment and examination option. The certification responsibilities would be provided in “one-stop shopping” to enhance customer service.

Cost

Costs for developing and implementing the various training, examination and certification models are variable. The following are summaries of current costs for the various program models:

1. *Private Pesticide Applicator Model:* The private pesticide applicator program is funded through a variety of sources. The applicator pays a \$35 fee; \$25 to the University of Minnesota Extension Service and \$10 to the MDA. This fee does not cover program implementation costs. Funding must come from additional sources such as the federal government for program viability. Numbers of participants, and thus fee income, are distributed unevenly throughout a three year period.

<i>Private Pesticide Applicator Activities and Funding</i>			
MDA Expense			
Project	Quantity	Expense	Funding Source
2000 PPAT Manual Printing	13,000 manuals	\$20,598.38	Pesticide Regulatory Account
2001 PPAT Manual Printing	11,000 manuals	\$15,628.66	Pesticide Regulatory Account
Clerical	1 FTE	\$40,000.00	Pesticide Regulatory Account
Income			
Private Pesticide Applicator Training			
	23,942 participants	\$35 fee	\$279,323/year (3 years)
	for three years	\$25 (UMES)*	\$199,516/year (3 years)
	1998-2000	\$10 (MDA)**	\$79,806/year (3 years)
* These fees cover printing of materials (examinations, applications and materials other than the manuals), delivery of materials, registration, mailing, exam scoring services, and Professional Education and Conference Planning staff time.			
** These fees are provided by UMES to MDA on a quarterly basis. They provide support for one FTE clerical position and for the development, printing and mailing of the MDA Update newsletter three times a year to private pesticide applicators (\$23,000/year).			

2. *Private Fumigation Endorsement Model.* The MDA and UMES have developed a project that may be a more cost-effective model; a private applicator fumigation endorsement program. The MDA hired an employee for 11 months who was located at the University of Minnesota - St. Paul campus to improve coordination. The employee worked closely with Extension staff in designing an electronic fumigation manual and exam. The closed book, monitored exams are conducted at county extension offices. A description of this program can be found at <http://www.extension.umn.edu/pesticides/pat/ppatfum1.pdf>. The MDA direct cost was approximately \$25,000 for employee salary to initiate the project. Additional in-kind costs by UMES were required for administrative support and materials. Several advisory group members agree that most farmers over 300 AU currently have Internet access and that almost all would by January 1, 2005.

UMES Cost Estimates for E-Delivery Based on Private Fumigation Manual Experience

Activity	Expense	Funding Duration
Initial Design of Web Site	\$400-\$500	One-Time
On-Going Web Site Maintenance	\$400-\$500	Per Year
Management of Manual Content, Etc.	\$600-\$700	Per year
Server "space" rent	estimated UMES in kind	Per year

3. *Commercial Animal Waste Technician Model:* The Legislature provided a one-time, one-year general fund appropriation of \$107,000 in FY99. Of this, a \$54,000 contract was provided from the MDA to the UMES to develop and print the manual. Postage was provided to pay for MDA manual distribution.

Minnesota Department of Agriculture

MDA Expenses	Item	Cost
Development of Informational Materials	brochures, slide set, placards	\$8,035
Development of Exam Questions	Pool of Questions for Each Category	\$6,375
Development of CD-ROM Exam	Providing CD-ROM version of exam	\$10,650
Administrative/Staffing Expenses - MDA	July 1, 1998 - June 30, 1999	\$19,533
Administrative/Staffing Expenses - MDA	July 1, 1999 - June 30, 2000	\$51,799
Administrative/Staffing Expenses - MDA	July 1, 2000 - present	\$10,843

MDA Income	Item	Revenue
License Revenue July 1, 1999 - June 30,2000	290 licenses	\$14,500
License Revenue July 1, 2000 - Present	30 licenses 2 additional cards	\$1,570

In FY 2000 the CAWT program had a net loss of \$37,299 and so far in FY 2001 there is a net loss of \$9,273. This shows the license fee is not sufficient for ongoing program administration. Initial funding must cover program implementation startup costs in order for a program to remain viable.

Aside from the cost, the CAWT program provides a good developmental model on how to implement the program. Initiation costs were provided with an initial one-time general fund appropriation. For the private manure applicator program, we would recommend a two-year appropriation rather than one. Initiation costs are greater than the maintenance costs. During subsequent years, new CAWT program participants are included through new business expansion, attrition/replacement or desire for enhanced training. This would not be the case for a private manure applicator program. There would be no new participants because any feedlot upgrade would require manure management plan, thus eliminating the need for certification.

Recommendations

Definition of Requirements

Who Needs to Become Certified?

Minn. Stat.18C.433 Subd. 1 (2000). “Requirement. Beginning January 1, 2005, except for a commercial animal waste technician, only a certified private manure applicator may apply animal waste from a feedlot that:

1. Has a capacity of 300 animal units or more; and
2. Does not have an updated manure management plan that meets the requirements of pollution control agency rules.”

As written, this requirement would apply to all persons applying manure from/on these farms; employees, children and spouses. The statute is modeled after the private pesticide applicator requirement Minn. Stat. 18B.36 (2000) where only a certified private applicator may use a restricted use pesticide to produce an agricultural commodity under certain conditions.

The advisory group expressed the following concerns: 1) As currently written, the statute would require farm children to become certified private manure applicators in addition to their parent(s); 2) Pesticides have label requirements that must be followed as law. A comparable requirement does not apply to manure; and 3) There is regulatory control of restricted use pesticides which is at the sale of the pesticide. The on-farm use of manure produced on that farm and applied by the farmer or their family does not have a similar regulatory control.

The goal of the private manure certification requirement should be to increase the knowledge about proper manure management, applicator safety and environmental protection. A clearer definition of the requirement would assist in meeting that goal.

There are several options for further defining the requirement. This would be helpful in clearly setting expectations for compliance and administration of a private manure certification program.

Leave As Is: Require anyone applying animal waste from a feedlot with items (1) and (2) to become certified. This would mean each employee or family member.

Exempt Family Members: Require one certification per family. Family members would work under the direction of the certified applicator. Employees must be certified.

Require One Certification Per Feedlot: All family members and employees at each feedlot would work under the direction of the certified applicator.

Exempt Children Under a Specific Age: Children 18 or younger or 21 or younger would be exempt from the certification requirement.

Require One Certification Per Operation: All family members and employees in each farming operation would work under the direction of the certified applicator.

Timeline for Implementation

The private manure applicator certification program requirement is scheduled to go into effect on January 1, 2005. The four-year period between this report and the implementation date results in some difficulty in determining the needs and costs. These assumptions are based on existing and similar programs in Minnesota and nearby states. As has been described before, there are many informational materials and media available on proper manure management.

The implementation process for the commercial animal waste technician program was completed in about 1.5 years. A similar adaptation of existing materials into a private manure applicator certification could be completed in a similar time period. If funding were provided for the fiscal year starting July 1, 2001, the certification program could be available on January 1, 2003. This would allow a two-year phase-in period before the requirement takes effect on January 1, 2005.

Technology changes may provide new program delivery opportunities during the next four years. For example, developing a program based upon current assumptions about information delivery methods may be more costly to administer and to participate in than one developed in the future. Improvements in technology and delivery methods over the next four years may result in a more cost effective and superior program delivery.

A decision for the Legislature to make is how to approach the January 1, 2005 implementation date. Should it stay in-place? If so, program development need not occur until the 2003 biennium.

Compliance Assistance and Enforcement

An aggressive promotional effort is needed to encourage participation and achieve compliance with the certification requirement. For success, the promotional effort informing private manure applicators about certification must:

1. Include stakeholder groups in the development and distribution of informational materials;
2. Use a variety of media to provide information to reach various participants;
3. Provide clear information on how to become certified;
4. Promote economic benefits and environmental enhancement of which results from certification; and
5. Evaluate effectiveness in delivery of informational materials.

This promotional effort should begin at least six months prior to the implementation date and continue after the implementation date to ensure full participation.

By promoting economic and environmental benefits through proper manure management, a promotional effort can be an incentive to participate in the required program. However, to ensure participation in a private manure applicator certification program, there also needs to be a clear definition of the consequences for failure to participate or non-compliance.

For sound and fair enforcement of the certification requirement, clarification on the following is needed:

1. Definition of lead agency with responsibility for enforcing certification requirements;
2. Statutory authorization for enforcement of certification requirement. Specifically, does Minn. Stat. 18C.111 (2000) or some other appropriate statute need to be modified to include manure applicator certification requirements or does it need to be replicated with manure applicator certification requirements?
3. Cross referencing with Minn. Stat. 18D (2000) or other appropriate law for purposes of inspection, sampling and enforcement.

Private manure applicators will need to be aware of their responsibilities to maintain certification. The interaction between the Minnesota Pollution Control Agency rule requirement compliance efforts and the lead agency responsible for private manure applicator certification needs to be defined and described. This is necessary for the applicators and feedlot operators to be aware of and understand who is responsible for what and why.

For example, will a violation of the feedlot rule affect certification or will a violation of certification requirements affect a feedlot permit?

It is also helpful for program participants to be aware of regulatory consequences. The Illinois Department of Agriculture includes violation procedures in their statute [Ill. Admin. Code Ch. I, Sec. 900.901 (h) (2000)].

For violations pertaining to certified livestock manager requirements, the owner or operator shall be issued a warning letter for the first violation and shall be required to have a certified manager for the livestock waste handling facility within 30 days. For failure to comply with the warning letter within the 30 day period, the person shall be fined an administrative penalty of up to \$1,000 by the Department and shall be required to enter into an agreement to have a certified manager for the livestock waste handling facility within 30 working days. For continued failure to comply, the Department may issue and operational cease and desist order until compliance is attained. [510 ILCS 77/30(g)] The cease and desist order shall be canceled by the Department upon presentation of a valid certified livestock manager certificate issued in the name of the owner, operator, or current employee of the livestock facility.

Project Recommendations

The private manure applicator certification program can be initiated in the current biennium (2001-2003). The recommendations on recertification are based on an effort to reduce administrative costs in future years. The following are several recommendations for conducting certification:

Option One: Open-Book Examination

Competency in manure management would be achieved through an open-book examination. The examination may be preceded by a voluntary training workshop. The options listed are similar to programs in surrounding states. Their experience can be utilized in developing a Minnesota program. The examination should be based on a private manure applicator manual.

For program administration, the Legislature may:

1. Designate either the MDA or University of Minnesota Extension Service to be responsible for 1) compiling manure management information into training materials; 2) preparing an open-book certification examination; 3) delivering the training materials and examination through e-technology. Specific tasks could be distributed to MDA and UMES.
2. Ensure certification training materials and examination would be available starting January 1, 2003.
3. Define the manure management components of an examination.
4. Define that a private manure applicator may take an exam, up to a maximum of three times in a calendar year if they do not pass the exam.

We recommend an initial public investment through a one-time appropriation to the MDA for completion of certification tasks. The funding could be provided to the UMES through a contract (as was done with the CAWT program) or through an employee (as was done with the fumigation endorsement program).

The MDA or the UMES would also be responsible for program processing administration in addition to the completion of the tasks listed above. Administration includes, applications, fees, exams and issuing the certification. The study materials and exams must be prepared in electronic format to improve efficiency and provide better customer service. An initial up-front investment will result in decreased long-term costs.

For recertification, there are three options:

1. Complete an application and pay a fee
2. Complete an application, pay fee and take an open book exam
3. Complete an application, pay a fee and participate in an approved workshop

The latter is recommended.

Option Two - Open Book, Monitored Exam

This option would be similar to the above program except that the exam would be monitored (similar to commercial animal waste technician program). Monitoring reduces cheating and ensures the person taking the test, is the person responsible for taking the test. The cost will be greater due to the administration and monitoring of the exam. However, this service would generally be confined to a one or two year period and may be accepted as part of existing job responsibilities. Currently County Extension staff, county agriculture inspectors, Soil & Water Conservation Districts and MDA field staff are monitoring the commercial animal waste technician exams and could be responsible for monitoring a private manure applicator exam.

For recertification there are three options:

1. Complete an application and pay a fee
2. Complete an application, pay fee and take an open-book, monitored exam
3. Complete an application, pay fee and participate in an approved workshop

The latter is recommended.

Option Three - Training As Certification

Training would be approved according to the planning process already defined in statute. The formal, workshop training could be monitored by MDA or another verification could be approved by MDA. Certification would be issued upon completion of training and would be for a three-year period. Program administration, such as application, fee, and information updates would be conducted by the MDA for the cost of certification.

MDA Revenue Estimates for Program Implementation

Fee to Farmer (Paid Every 3 years)	Revenue (Based upon 1,400-1,800 Participants)
\$10	\$14,000-18,000
\$25	\$35,000-45,000
\$35	\$49,000-63,000
\$50	\$70,000-90,000

UMES Cost Estimates for Private Manure Certification Manual

Item	Description	Cost Breakdown	Cost
Development of Training Manual	Develop a training manual based on the CAWT manuals. 50% of materials coming from CAWT manual.	•Technical writer (\$25,500) •Project coordinator and technical advisory group (\$20,000)	\$45,500
Distribution of material via print or electronic form distributed.	Colored copies printed and distributed OR material converted to CD ROM and distributed.		\$20,000
Total Cost			\$65,500

The certification fee must be enough to support program administration throughout the term of the certification. If not, additional funding must be provided. The costs would include planning committee support, monitoring travel and expenses and clerical support for issuing the certification. It is likely that most workshops would be conducted in 2004 and fee based revenue would not arrive until that time.

In addition to the certification fee, the farmer would pay for the approved workshop. Workshop fees would be set by the sponsor of the workshop. Approved workshops may have variable fees. The farmer can choose

UMES Cost Estimates for Implementation of Voluntary or Mandatory Initial Training Workshops

Item	Description	Cost Breakdown	Cost
Develop and Deliver Educational Programs to farmers needing certification.	Develop presentation materials, organize, prepare and present workshops for private applicators.	•12 months manure specialist/ program	\$60,000
		•Refreshments and room charges \$10 per person	\$25,000
		•Promotional materials	\$2,000
		Total Cost	\$87,000

UMES Cost Estimates for Certification Exam Development and Implementation

Item	Description	Cost Breakdown	Cost
Exam Development	Write a series of test questions based on manual, layout and printing. Cost estimate based on MDA costs for CAWT test writing.	•Could be done by either MDA or UMES	\$10,000
Development of CD-ROM Exam	Convert print copy of exams to CD-ROM version. Cost estimate based on MDA costs or CAWT CD-ROM conversion.	•Could be done by either MDA or UMES	\$10,000
Administration of program by UMES or MDA	Monitoring exams, scoring exams, record keeping and general administration of program. <i>(Note: no annual fee to maintain program is included)</i>	•One time cost for startup and 24 month program	\$80,000
		Total Cost	\$100,000

the appropriate approved workshop for their needs. The workshops need to meet general standards for approval.

For recertification, there are two options:

1. Complete an application and pay a fee
2. Complete an application, pay fee and participate in an approved workshop

The latter is recommended.

Based on their experience, the advisory group considered and did not support the following options:

1. Private sector administered program similar to Certified Crop Advisor Program because of potentially high training costs to the farmer and limited flexible requirements for administration. The private sector could not develop a program with existing fee limitations imposed in Minn. Stat. 18C.433.
2. Closed-book exams and closed-book, monitored exams because of high administrative costs and limited flexibility for the applicator.

Types of Training for Initial Certification and Continuing Education Training for Recertification

Program	Initial Training & Certification	Continuing Education Training & Recertification	Certificate Program Fee
Commercial & Noncommercial Pesticide Applicator	Self study, closed book exam, monitored at MDA office	Classroom workshop with monitoring for attendance; or self study at home, open book test, no monitoring. Scheduling possible	\$90 annually
Certified Crop Advisor	Classroom, closed book test, monitored	CEU's	\$100 international (initial exam, \$50 for each additional, until passed) \$75 state exam (includes 4 attempts to pass) \$45 annual renewal fee (\$10 state & \$35 international)
Commercial Animal Waste Technician	Self study at home, open book test, monitored	Classroom workshop two of three years	\$50 every three years
Private Pesticide Applicator	Voluntary classroom, workshop, self study at home, open book test, no monitoring (cheating possible)	Voluntary classroom, workshop, self study at home, open book test, no monitoring (cheating possible)	\$35 every three years

Appendix

Minnesota— Private Pesticide Applicator Program

UNIVERSITY OF MINNESOTA

Extension

S E R V I C E

Private Pesticide Applicator Training

2000 Test Booklet

- Read all directions inside before starting the test
- This test will not be accepted after **December 31, 2001**
- Keep this test booklet, marked with your answers, for your records
- To complete this test and become certified you must use:
 - a. 16th Edition Private Pesticide Applicator Training manual
 - b. the enclosed answer sheet
 - c. the **Minnesota Department of Agriculture's** application card located on this page
- If items are missing from this packet or you want more information, contact your county extension office or call the number below
- Do not use materials from other testing packets to complete this test!

The University Minnesota Extension Service is an equal opportunity educator and employer.

This material is available in alternate formats. Please contact Heather Dorr at 1-800-367-5363 to make request.

Crease at perforations, then separate or cut.



This is your "Application for MN Dept. of Agriculture I.D. card" Return the filled-out card—with your completed test and your check—to the University of Minnesota.



Minnesota Department of Agriculture, Agronomy Services Division
90 West Plato Boulevard, St. Paul, MN 55107-2094
Telephone: 651/296-5715

N# 074666

CHECK APPROPRIATE BC

New Application _____

Renewal Application _____

Previous Certification Card Number _____

**APPLICATION FOR PRIVATE PESTICIDE
APPLICATOR'S CERTIFICATION CARD (Min. Stat. § 18B.36)**

The data which you supply on this form will be used to assess your qualifications for Private Pesticide Applicator Certification. You are not required to provide this data, but we will not be able to grant certification without it. The application data will constitute a public record if and certification is granted, except for your Social Security Number. Anyone may request copies of this application data at the time the certification is granted. However, we will withhold the applicant's Social Security Number.

Name (First, Middle Initial, Last) - PLEASE PRINT	
Address (Street, Route, Box Number)	
City, State, Zip Code	County
Telephone Number (Include Area Code)	Birth Date
Social Security Number	Did applicant attend private applicator training? <input type="checkbox"/> YES <input type="checkbox"/> NO
Location	Date
Instructor	

I hereby certify that the information contained in this application is true and correct.

Applicant's Signature	Date
-----------------------	------

AG-00016-02 (7/92) In accordance with the Americans With Disabilities Act, an alternative form of communication is available upon request. Minnesota Department of Agriculture. Telecommunications Device for the Deaf (TDD): 612/297-5353 or 1-800/627-3529

Minnesota—Private Pesticide Applicator Training

2000

This test is to be used only with the 16th Edition Private Pesticide Applicator Manual.

GENERAL INFORMATION FOR 2000 PRIVATE PESTICIDE APPLICATOR TRAINING

Who needs to be a certified Private Pesticide Applicator in Minnesota?

You need to be certified or recertified as a Minnesota private pesticide applicator if you:

1. apply pesticides to land or sites you own, rent or lease for the production of agricultural commodities,
and
2. plan to use Restricted Use Pesticides (RUP),
and
3. reside in the state of Minnesota, (for example, you should be certified in the same state in which you hold a drivers license),
and
4. your certification expires before you need the RUP.

How do I become certified or recertified as a Private Pesticide Applicator?

The requirements for initial certification and recertification are the same. You need to:

1. visit your University of Minnesota Extension Service county office to pick up a Private Pesticide Applicator Training packet which includes this test booklet and the training manual,
and
2. complete the open book test with a passing score of 80% or more,
and
3. complete an Application for Minnesota Department of Agriculture I.D. card, (perforated card, front cover of the test booklet)
and
4. pay a \$35 fee (with check written to the **University of Minnesota**),
and
5. mail the completed test, application card and check, in the envelope provided.

Check with your local county Extension Office for pesticide applicator training workshop schedules.

Who can I contact for general information about this course?

Contact Professional Education & Conference Planning with questions other than course content:

Heather Dorr, Program Coordinator
1-800-367-5363 or 612-625-5267
hdorr@extension.umn.edu

How will I know I have passed the test?

If you pass the test with a score of 80% or better, you will receive a blue postcard in the mail within 3 weeks. It is a temporary permit, which is valid for 60 days. Within 60 days you will receive a plastic certification card from the MDA with your assigned certification number. If you fail to pass the test the first time, you will receive a letter notifying you of your test score and a new answer sheet to retake the test. You can take the test a maximum of three times in 12 months.

How do I get a replacement I.D. card or report that I never received my card after passing the test?

If you do not receive the plastic I.D. card within 60 days of passing your test, or if you need a replacement card, call 651-296-6715.

Who needs my certification number?

Retail dealers of RUPs will require proof of current certification before allowing delivery of any RUP. Anyone applying a RUP must be certified.

How long am I certified for?

Your private pesticide applicator's license is valid until March 1 of the 3rd year after the year you become certified. See pages 10-11, part 2 (Pesticide Laws) of the Private Pesticide Applicator Manual for more detailed information. Applicators certified during 2000 will have a certification expiration of March 1, 2003.

What is the \$35 fee used for?

The Minnesota Department of Agriculture, as the state lead agency for pesticide applicator certification, receives \$10 of the fee. The University of Minnesota Extension Service receives \$25 of the fee for program development and operating costs (manuals, tests, handling, scoring, educational materials, etc.) and to help offset local county Extension Office costs for delivering the program.

What can I do if I do not understand a test question?

Contact your local county Extension Office or contact the Health, Environmental and Pesticide Safety Program Coordinator for the State of Minnesota:

Dean Herzfeld
University of Minnesota Dept. of Plant Pathology
495 Borlaug Hall, 1991 Upper Buford Circle
St. Paul, MN 55108 Phone: 612-624-3477
deanh@tc.umn.edu

Certified Crop Advisers

1821 University Ave - Room 204 South * St. Paul, MN 55104
651.644.6235 * FAX 651.644.9348 * e-Mail - cca@mcpr-cca.org

CCA Presentation Private Manure Applicator Advisory Group November 9, 2000 – MDA Offices

What is CCA? (Certified Crop Adviser)

Is a voluntary program to certify persons advising growers on crop production inputs. The goal of the program is to document that such advisers are qualified to make crop production recommendations which are economically and environmentally sound. The CCA program is a national program coordinated by the American Society of Agronomy (ASA). The development of the program will be done by a state board made up of representatives from state agencies (departments of ag and local EPA), Natural Resource Conservation Service (NRCS), university staff (U of MN), farmers, agribusiness and consultants.

What are the componets of the CCA program?

1. All applicants must pass (75%) a national and state exam. The national exam is prepared by the national board and the state exam is prepared by the state board.

The exams are scored by the national office and equated to make sure the degree of difficulty is the same from exam to exam.
2. Applicants are required to submit two references – one from a client (farmer) and one from a supervisor. This is to verify the applicant is active in the business of making crop production recommendations.
3. Applicants must have a minimum four years of work experience in crop production recommendations plus a high school education. Education can substitute for some experience according to the following schedule:

B.S. degree may substitute for up to 2 years of work experience.

Associate degree may substitute for up 1 year of work experience.

Summer internships may substitute for up to six months of experience.

Minnesota— Certified Crop Adviser Program

Note, farming counts for only one year of work experience.

4. Applicants must sign a code of ethics.
5. Once certified, persons must attend 40 hours of Continuing Education Units (CEUs) in competency areas every two years. The state board approves the CEUs and the event vendor maintains an attendance list.

What are the competency areas covered under CCA?

There are four areas CCAs must be competent in. They are: nutrient management, pest management, soil and water management and crop production.

The questions for the exams are based on these competency areas and the number of questions per area is set by the respective board (state or national).

The CEUs are also approved for each competency area. Each person must have at least 5 CEUs per competency area in addition to meeting the requirement of 40 CEUs every 2 years.

Minnesota specifics.

Minnesota was one of the original eight states to implement the CCA program in 1993. The Minnesota board has 16 members including 5 honorary members from the University of Minnesota specialty areas (soil science, plant pathology, entomology, agronomy, weed science, etc).

In total, there are over 14,000 CCAs world wide (US and Canada). Minnesota has 863 CCAs.

The Minnesota board has signed a Memorandum of Understanding with the NRCS enabling CCAs to serve as third party vendors in preparing nutrient and pest management plans under federal cost sharing programs.

The Minnesota program is one of three in the country to track CEUs for CCAs. In other states, the national office provides the tracking and record keeping of the CEUs.

STEPS INVOLVED IN THE CERTIFIED CROP ADVISER 'CCA' PROGRAM FOR CCA's and CEU's

STEPS:

1. Contact the National or your state office, they will send out an application.
2. Fill out application for exam and send with payment to the National office.
3. Each applicant is assigned a CCA number at this time.
4. Study materials can be ordered through State or National offices.
5. Take the exam, the exams are generally given the first Friday of February and August.

CONGRATULATIONS YOU PASSED:

1. National will send you a packet of information to fill out for State review.
 - ◆ Credentials Application
 - ◆ Code of ethics
 - ◆ Education form
 - ◆ Experience form
 - ◆ And 2 references are needed.
 1. 1 from your employer
 2. And 1 from a client.

YOU'VE BEEN APPROVED! YOU HAVE YOUR CERTIFICATE!

Now you need to take Continuing Education Credits (CEU's)

CEU's are required, the process is on a two year recertification system. You need 40 CEU's or 40 hours of approved credited class time within that two-year period. At least 10 in each year and 5 in each of the four competency areas.

HOW CLASSES ARE APPROVED

State classes:

1. Application is filled out by the sponsoring firm, and sent to the state office.
2. The state office assures all of the information is included then sends them to three board members identified as the CEU Review Committee. Two approvals are needed for a class to be given CEU's.
3. Once approved:
 - ◆ A number is assigned by the State office
 - ◆ An approval letter is sent to the sponsor, along with an attendance form.

National classes: are the same format except they are sent to the National office and Committee. To qualify for National credits, the sponsor must be holding the class in five or more states.

HOW ATTENDANCE GETS LOGGED:

1. After the class is finished the attendance form is returned to the State office, logged and sent by disk to the National office and put in CCA's permanent file.
2. An update of credits accrued is sent out by the National office each quarter.
3. Corrections and additions can be made by calling the state office.

AT THE END OF THE TWO YEAR CYCLE:

1. National reviews all CCA's at the end of their two year cycle for:
 - ◆ At least 10 CEU's each year
 - ◆ At least 40 CEU's total
 - ◆ At Least 5 CEU's in each competency area.
2. Those people passing all criteria are sent a renewal notice.
3. When renewal notice is returned, a new certificate and card is issued.

Illinois— Certified Livestock Manager Statute

SUB PART I: CERTIFIED LIVESTOCK MANAGER

Section 900.901 Applicability

- A. *A livestock waste handling facility serving 300 or greater animal units shall be operated only under the supervision of a certified livestock manager. Notwithstanding the before-stated provision, a livestock waste handling facility may be operated on an interim basis, but not to exceed 6 months, to allow for the owner or operator of the facility to become certified.* [510 ILCS 77/30(a)] For the purposes of this Subpart, being operated under the supervision of a certified livestock manager shall be immediately available to workers at a livestock waste handling facility either in person or via telecommunications and shall have the ability to be physically present at the livestock waste handling facility within one hour of notification.
- B. Persons may become certified livestock managers by demonstrating an understanding of and competence for the operation of livestock waste handling facilities as established in Section 30 of the Livestock Management Facilities Act [510 ILCS 77/30] and further describes in this Subpart. Livestock managers shall establish or re-establish certification when required to do so in accordance with Section 30 of the Livestock Management Facilities Act.
- C. A livestock manager certified pursuant to the emergency amendment adopted in R97-14 at 20 Ill. Reg. 14903, effective October 31, 1996 and the emergency rules adopted in R97-14 at 21 Ill. Reg. 4313, effective March 31, 1997, shall be considered as certified pursuant to this Subpart.
- D. For the purposes of this Subpart, the number of animal units served by a livestock waste handling facility is the maximum design capacity of the livestock management facility which is being served by the livestock waste handling facility.
- E. Any certification shall be valid for 3 years and thereafter subject to renewal. A renewal shall be valid for a 3 year period and the procedures set forth in Section 30 of the Livestock Management Facilities Act shall be followed. The Department may require anyone who is certified to be recertified in less than 3 years for just cause including but not limited to repeated complaints where investigations reveal the need to improve management practices. [510 ILCS 77/30(c)] Examples include, but are not limited to, lagoon maintenance violations, improper waste handling practices, waste management plan violations, other violations of the Livestock Management Facilities Act or rules promulgated thereunder, or violations of other Acts related to livestock management practices including the Dead Animal Disposal Act [225 ILCS 610].
- F. The following methods shall be utilized by an owner or operator to become certified:
- (1) *The owner or operator of a livestock waste handling facility serving 300 or greater animal units but less than 1,000 animal units shall become a certified livestock manager by:*
- (A) *attending a training session conducted by the Department of Agriculture, Cooperative Extension Service, or any agriculture association, which has been approved by or is in cooperation with the Department; or*
- (B) *in lieu of attendance at a training session, successfully completing a written competency examination.*
- (2) *The owner or operator of a livestock waste handling facility serving 1,000 or greater animal units shall become a certified livestock manager by attending a training session conducted by the Department of Agriculture, Cooperative Extension Service, or any agriculture association, which has been approved by or is in cooperation with the Department; and successfully completing a written competency examination.* [510 ILCS 77/30(d)]
- G. The Department shall charge \$10 for the issuance or renewal of a certified livestock manager certificate. [510 ILCS 77/30(f)]
- H. For violations pertaining to the certified livestock manager requirements, the owner or operator *shall be issued a warning letter for the first violation and shall be required to have a certified manager for the livestock waste handling facility within 30 working days. For failure to comply with the warning letter within the 30 day period, the person shall be fined an administrative penalty of up to \$1,000 by the Department and shall be required to enter into an agreement to have a certified manager for the livestock waste handling facility within 30 working days. For continued failure to comply, the Department may issue an operational cease and desist order until compliance is attained.* [510 ILCS 77/30(g)] The cease and desist order shall be cancelled by the Department upon presentation to the Department of a valid certified livestock manager certificate issued in the name of the owner, operator, or current employee of the livestock facility.



Certified Livestock Manager Training

Best Management Practices for Being a Good Neighbor

2000 - 2001

<http://clmt.outreach.uiuc.edu>

Cooperative Extension Service
United State Department of Agriculture
122 Mumford Hall
1301 West Gregory Drive
Urbana, IL 61801

Dear Livestock Producer:

Since May 21, 1996, Illinois livestock operations having a design capacity of more than 300 animal units are required to have a Certified Livestock Manager. The Certified Livestock Manager Program is administered by the Illinois Department of Agriculture. The University of Illinois Extension has developed a training program to help you fulfill the requirements for certification.

Since 1997, 3,715 people have attended the workshops that are offered each year at different dates and locations around the state. If you missed them or you have new employees who need to be certified, now is your chance. Workshop dates and locations are listed in this brochure.

This training brings together a broad range of disciplines: environment, economics, animal sciences, and engineering. By attending the workshop, you can expect to learn Best Management Practices that will not only help you comply with state law, but may also improve your operation's bottom line and make a safer working environment in your facilities.

Each workshop begins at 8:50 a.m. and concludes at 12:30 p.m. At 1:30 p.m., the Illinois Department of Agriculture staff will be available on site to administer the Certified Livestock Manager exam to those producers required to take the exam.

For more information: please check with Randy Fonner (217.333.2611) or clmt@age.uiuc.edu, the Extension Coordinator for the Certified Livestock Manager Training. Also the CLMT web site is at <http://clmt.outreach.uiuc.edu> look forward to seeing you at a training workshop.

Ted L. Funk
Extension Specialist, Agricultural Engineering



DATES & LOCATIONS*	PROGRAM	REGISTRATION FORM
<p>OCTOBER 19, 2000 Location: Tazewell Co., Extension Office 1505 Valle Vista, Pekin, IL. Phone the Tazewell County Extension at 309 - 347-6614 for directions.</p>	<p>8:15 a.m. Registration 8:50 a.m. Welcome 9:00a.m. Environmental Awareness</p>	<p>Registration is required at least three days before the workshop you plan to attend. Walk-ins may not be accommodated.</p>
<p>NOVEMBER 1, 2000 Location: Clinton Co. Extension Office Farm Bureau Bldg., Breese, IL. Phone Clinton County Extension at 618-526-4551 for directions.</p>	<p>9:25 a.m. Developing a Manure Management Plan, Part 1* Break</p>	<p>To Register: Option 1- Call ACES Marketing & Distribution at 1.800.345.6087 and ask to register for a CLMT workshop and order your 2000 CLM T manual.</p>
<p>DECEMBER 5, 2000 Location: Knox Co. Extension Office, 180 South Soangetaha Rd., Suite 108, Galesburg, IL. Phone Knox County Extension at 309-342-5108 for directions.</p>	<p>10:00 a.m. Developing a Manure Management Plan, Part 2* 10:10 a.m. Manure Systems Break</p>	<p>Option 2 - MAIL. Please mail this form and a check (payable to University of Illinois) for \$36.50 (\$10. for the workshop and \$26.50 for the manual/shipping and handling): ACES Marketing & Distribution Attn: CLM Training Ag. Services Bldg. 197 S. Wright St. Champaign, IL 61820</p>
<p>DECEMBER 12, 2000 Location: DeKalb Co. Extension Office Farm Bureau Bldg., 1350 W. Prairie Dr., Sycamore, IL. Phone DeKalb County Extension at 815-758-8194 for directions.</p>	<p>11:20 a.m. Break 11:30 a.m. Odor Control 12:05 p.m. Illinois Regulations Lunch on your own</p>	<p>Option 3 - E-mail the information below to ACESPUBS@UIUC.EDU or use the on-line registration form on the CLMT web page at http://clmt.outreach.uiuc.edu and mail a check to the address in Option 2.</p>
<p>FEBRUARY 6, 2001 Location: 4-H Bldg, US Highway 50-7.5 miles west of Lawrenceville, IL. Phone Lawrence/Richland County Extension at 618-943-5018 for directions.</p>	<p>1:30 p.m. IDOA Exam available * CCA credit is available for this part of the workshop.</p>	<p>Option 3 - E-mail the information below to ACESPUBS@UIUC.EDU or use the on-line registration form on the CLMT web page at http://clmt.outreach.uiuc.edu and mail a check to the address in Option 2.</p>
<p>FEBRUARY 13, 2001 Location: Pike Co. Extension Office, Farm Bureau Bldg. 1301 E. Washington, Pittsfield, IL. Phone Pike County Extension at 217-285-5543 for directions.</p>	<p>For more information: Contact Randy Fonner by calling 217.333.2611 or via email at clmt@age.uiuc.edu</p>	<p>Please register me for the following Certified Livestock Manager Training Workshop:</p>
<p>FEBRUARY 20, 2001 Location: McLean Co. Extension Office 402 N. Hershey Rd., Bloomington, IL. Phone McLean County Extension at 309-663-8306 for directions.</p>	<p>If your facility already has a 1999 or 2000 manual you do not need to purchase another manual. If you have an older manual or do not have one, you are required to purchase one</p>	<p>Location _____ Date _____ Name: _____ Address: _____ City: _____ Zip: _____ Phone: (____) _____</p>
<p>MARCH 1, 2001 Location: Highland Community College, Bldg. A, Freeport, IL. Phone Stephenson County Extension at 815-235-4125 for directions.</p>	<p>State • County • Local Groups • USDA Cooperating The University of Illinois Extension provides equal opportunity in programs and employment</p>	

*SEATING LIMITED AT ALL LOCATIONS
 PRE-REGISTRATION IS REQUIRED

Iowa—Extension Implementation Expenses

**IOWA STATE UNIVERSITY EXTENSION SERVICE
MANURE APPLICATION CERTIFICATION EXPENSES
December 1,1999 — November 30, 2000**

Regular Salary.....	29,065.12	
Hourly Wages	198.00	
Benefits (Salary & Hourly)	6892.20	
Travel	483.16	
Supplies/Materials	6720.11	(Satellite Downlink 2/24/00)
Printing	4,049.93	
Overheads (\$2800.50)		
Pm - 1811 - Managing Manure Nutrients (\$1,032.22)		
Confinement Study Guide Updates (\$217.21)		
Honoraria/Services	140.00	(-production/alternation fees)
Other.....	6,969.86	
Vidoetapes (\$912.80)		
Manure Field Day 8/11/00 (\$121.63)		
Satellite Downlink 9/20/99 (\$5,935.43)		
TOTAL SPENT TO DATE	54,518.38	
CASH RECEIVED	57,120.00	(4/7/00; 7/24/00; 10/10/00)
UNSPENT BALANCE.....	\$2,601.62	

(Financial report total of \$53,872.72) does not include November expenses of \$645.66 for hourly payroll/benefits and travel.)

For Animal Producers and Manure Applicators Manure Applicators Certification

January
2000



Animal Manure
Management
Fact Sheet 2

House File 2494, passed in the spring of 1998, requires manure applicators in Iowa to be certified.

Who is Affected

Commercial manure applicators: Commercial applicators must be certified to apply or haul dry and liquid manure. A commercial applicator is anyone who is in the business of manure application and who charges a fee for applying manure on the land of another person. Commercial applicators must be certified regardless of the source of the manure (open feedlot or confinement) and the size of the operation.

New employees of commercial applicators who are not yet certified can apply manure for the first 30 days after they are hired if they are directly supervised by a certified commercial manure applicator. The supervisor must be physically present and able to see and communicate with the new employee at all times. After 30 days, they must be certified.

Confinement site manure applicators: Confinement site manure applicators or noncommercial applicators must also be certified to apply or haul dry and liquid manure from a confinement feeding operation. If the source of the manure is an open feedlot or a Small Animal Feeding Operation (SAFO¹), certification is not needed by the noncommercial applicator.

Exemptions: Confinement site applicators may include people who are part-time employees of or who trade work with other active farmers. The following people are exempt from commercial certification, but must still have confinement site certification:

- someone actively engaged in farming and trades work with another active farmer,
- someone employed by an active farmer and applies manure only as an incidental part of the job,
- if applies manure as an incidental part of a custom farming operation, or
- if applies manure as an incidental part of their job duties.

Confinement site applicators are exempt from certification if they are

- part-time employees of a confinement site

applicator and are under the direct instruction and control (physically present, physical observation and communication) of a certified confinement site manure applicator where the certified applicator can physically observe and communicate with the supervised person at all times.

Becoming Certified

To become certified, an applicator must:

- pass an exam or attend a certification training course
- apply for certification on a DNR form, and
- pay the \$50 certification fee.

Certification Training Courses

Iowa State University Extension offers certification courses throughout the state. The course for commercial applicators is three hours long. For confinement site applicators, the course is two hours.

A list of course dates and locations is available on the Iowa Manure Management Action Group (IMMAG) website at <<http://extension.agron.iastate.edu/immag/certificationFr.html>>. Or, contact your local Extension office for a schedule.

Testing

The DNR administers certification tests for commercial and confinement site applicators. The tests have 50 multiple choice and true-false questions. Those who want to take either test should bring a photo identification card and a #2 lead pencil to the test site. Contact a DNR field office for a list of test times and sites. (See back for phone numbers.)

Training Manual and Test Preparation

Applicators may want to purchase the “Manure Applicator Certification Study Guide” to use when studying for the test. The guides are available for \$20 at ISU Extension county offices, or through Extension Distribution, Printing and Publications Building, Iowa State University, Ames, IA 50011-

¹ “Small Animal Feeding Operation” means an animal feeding operation that has an animal weight capacity of 200,000 pounds or less for animals other than bovine (1,333 finishers at an average weight of 150 pounds), or 400,000 pounds or less for bovine (333 dairy cows at an average weight of 1,200 pounds).

3171, (515) 294-5247. Commercial applicators should order Pm-1778 and confinement site applicators should order Pm-1779.

To pass the test, you should understand:

- the effects of manure on water quality,
- manure application requirements of the law,
- the relative concentration of nutrients in different types of storage structures,
- how to determine if a manure management plan is reasonable and accurate (e.g., know general application rates from different types of storage),
- what records must be kept, and
- what to do if a manure release occurs or is likely to occur.

If you fail the test, you may retake it on a different day or attend a training course to qualify for certification.

Certificate Renewal

Commercial applicators need to renew their certification and licenses every year by passing a test or by attending three hours of continuing education.

Confinement site applicators must renew their certification every three years by passing a test or attending two hours of continuing education each year of the three-year period.

To renew a certificate:

- send the renewal request on the DNR form prior to or postmarked by the certificate expiration date,
- include renewal fee of \$50, and
- include proof of a passing the examination or attending the continuing education course(s).

Requirements for Manure Applicators

All applicators must comply with requirements for land application, including the minimum separation distances. They must also follow the manure management plan (if a plan is required). And, they must report any releases to their DNR field office.

Recordkeeping requirements: Commercial manure applicators must maintain the following records for three years:

- a copy of the livestock owner's instructions for manure application,
- dates that manure was applied or sold,
- the manure application rate, and
- location of fields where manure was applied.

Confinement site manure applicators who are required to submit manure management plans must maintain the following records for a minimum of

three years following application (or the length of the crop rotation, if greater):

- methods of application,
- dates when the manure was applied or sold,
- location of the field and number of acres where the manure was applied, and
- the manure application rate.

Commercial applicators' equipment requirements:

- do not use manure tanks and equipment to haul hazardous or toxic wastes,
- do not use tanks or equipment in a way that would contaminate drinking water, or endanger the food chain or public health,
- maintain watertight connections on all pumps and associated piping,
- prevent direct connections between a drinking water source and the tank or equipment,
- display the certification numbers of the certified applicator in three-inch (3") or larger letters and numbers on the side of the tank or vehicle, and
- prominently display the name and address of the certified applicator on the side of the tank or vehicle.

Disciplinary Actions

Certified commercial and confinement site applicators can lose their certification or be put on probation if they:

- violate state law or rules,
- fail to maintain the required application records or reports, or
- knowingly make false statements, representations or certification to the DNR.

An applicator whose certification is revoked cannot apply dry or liquid manure to the land. The applicator may reapply for certification after two years and will have to pass an examination. Failure to become certified or applying manure without a certificate can result in an administrative order, a civil penalty or a court action.

For More Information

DNR Field Office 1, Manchester	319-927-2640
DNR Field Office 2, Mason City	515-424-4073
DNR Field Office 3, Spencer	712-262-4177
DNR Field Office 4, Atlantic	712-243-1934
DNR Field Office 5, Des Moines	515-281-9069
DNR Field Office 6, Washington	319-653-2135
Check the DNR website at	
< http://www.state.ia.us/government/dnr/organiza/epd/index.htm >	
Construction Permits	515-281-8877

DNR 115: 1,2000

South Dakota— 2000 Training Program

DEPARTMENT OF AG COMMUNICATIONS SOUTH DAKOTA STATE UNIVERSITY

Manure Management Training July 24 for Livestock Producers

HURON, SD --An environmental and manure management training session for livestock producers will be held in Huron on Monday, July 24, 2000, announced Charles H. Ullery, Extension water and natural resources specialist at South Dakota State University.

The meeting, held at the Crossroads Motel, will provide livestock producers with manure and environmental training required to obtain a livestock permit from the S.D. Department of Environment and Natural Resources, according to Ullery. He coordinates the Extension livestock and manure management program.

The meeting begins at 9:30 a.m. and is scheduled to end at 4:30 p.m. Registration, beginning at 9:00 a.m., includes a lunch, coffee breaks and a training manual. The cost is \$25. Advance registration is not required.

- S.D. Regulations for Animal and Swine Livestock Permits, Jeanie Votava, natural resources engineer, S.D. Department of Environment and Natural Resources,
- Livestock Production and the Environment, Charles Ullery,
- Manure Handling Systems and Manure and Nutrient Production, Ullery,
- Using Manure as a Fertilizer and Land Application of Manure, Jim Gerwing, SDSU Extension soils specialist,
- Safety and Health Concerns with Manure Management, William Campbell, SDSU Extension farm and safety specialist,
- Nutrition Management for Reducing Manure Nutrients and Odors, Julie Walker, Extension area beef specialist, Pierre &
- Odor Management and Control, Ullery.

All South Dakota livestock producers are welcome to attend and learn about manure management practices that protect the environment and use manure nutrients as fertilizers, according to Ullery.

While most producers aren't required to have a livestock permit, current federal EPA and USDA programs encourage producers who don't permits to voluntarily adopt and use livestock production and manure management practices that protect water quality.

In addition, some South Dakota counties have zoning ordinances regarding the location of new livestock operations that have the purpose of preventing water pollution and odor problems.

Topics to be covered include water and odor pollution process, how to obtain a livestock permit, regulations for livestock operations, amount of manure and nutrients produced by livestock, determining land application rates for manure, preparing a manure management plan, potential health problems associated with handling manure, altering animal diets to maintain livestock performance while reducing odors, and manure nutrients.

For more information, contact Charles Ullery, Agricultural and Biosystems Engineering, SDSU, Brookings, SD 57007, (605) 688-5144 or fax (605) 688-6764. Ullery's email address is Ullery.Charles@ces.sdstate.edu

South Dakota Certification Program Description

Concentrated Animal Feeding Operations

<http://www.state.sd.us/denr/sw>

Why are feedlot regulations important in South Dakota?

In recent years, manure spills in other states focused nationwide attention on large animal feeding operations. In 1996, several large pork producers were looking at locating swine feeding operations in South Dakota. To ensure appropriate environmental controls are in place to address new and expanding swine units, the department worked with the people of South Dakota to develop a general permit containing all the requirements necessary to protect the state's ground water and surface water resources. This permit became effective February 1, 1997.

Shortly after the first permit was implemented, the South Dakota Department of Agriculture asked DENR to develop a second general permit that would apply to all other types of livestock feeding operations. This permit became effective February 10, 1998. These two permits establish the environmental standards that a producer must meet to design, construct and operate a livestock confinement operation in South Dakota.

Do I need a permit?

You need a permit if:

- you have a new or expanding livestock confinement operation with 1,000 animal units or more;
- your operation, regardless of size, is required to obtain approval by a local government entity – such as a county commission; or
- your operation, regardless of size, when DENR determines permit coverage is necessary to ensure protection of the state's water resources.

1,000 Animal Units is equivalent to:

- 1,000 slaughter or feeder cattle;
- 1,000 dairy heifers;
- 700 mature dairy cattle;
- 2,500 finisher swine;
- 10,000 nursery swine;
- 2,130 production sows;
- 270 sow farrow to finish unit;
- 500 horses;
- 10,000 sheep or lambs;
- 30,000 chickens;
- 55,000 turkeys;
- 5,000 ducks or geese; or
- a combination of animals

How Does the Permitting Process Work?

The permit process begins when a producer submits an application to DENR for general permit coverage. The permit application must include a Certification of Applicant form, plans and specifications signed and stamped by a South Dakota licensed engineer, a signed operation and maintenance guideline, and a nutrient management plan. Following DENR's review and approval of the permit application, construction of the manure management system can begin. The department must be notified when construction begins to allow for construction inspections as required by state rules. The project engineer must submit a Notice of Completion to DENR when construction of the manure management system is completed. A Certificate of Compliance and permit coverage is then issued by DENR, allowing the facility to begin operation.

Where do I get a feedlot permit?

For information please contact Kent Woodmansey (kent.woodmansey@state.sd.us) or Jeanie Votava (jeanie.votava@state.sd.us), Surface Water Quality at (605) 773-3351.



South Dakota
State University

COOPERATIVE
EXTENSION
SERVICE

College of Agriculture and
Biological Sciences

Agricultural Engineering
Department

Food Process Engineering

Agricultural Systems Technology

Box 2120, SDSU
Brookings, SD 57007-1496
Phone 605-688-5141

January 23, 2001

Mr. Rick Hansen
Minnesota Department of Agriculture
90 West Plato Blvd.
St. Paul, MN 55107-2094

RE: SD Manure and Environmental Training Program for Livestock Producers

Dear Rick,

As per recent telephone conversations with Karen Zimmerman requesting information about South Dakota's Manure and Environmental Training Program for Livestock Producers, I'm faxing you the following selected materials:

1. Cover and table of contents for notebook used in one-day training (6 pages),
2. Program listing topics covered in training sessions (1 page),
3. Registration form for training sessions (1 page),
4. Evaluation form used for training sessions (2 pages),
5. News release on March, 2001 training sessions (2 pages),
6. Power Point Slide highlights of SD Livestock Permit Program (4 pages),
7. Cover page permit regulations for swine (SDG-044000) and training and education statement (2 pages),
8. Cover page permit regulations for non-swine (SDG-010000) and training and education statement (2 pages),
9. Web site to obtain copies of regulations for two livestock permit (www.state.sd.us/demr/des/surfacewater/feedlotpermits.htm).

I am sending you by overnight courier copies of the above materials along with one of the training notebooks.

The SD State University Cooperative Extension Service is responsible for conducting the one-day training and education program that livestock producers must take before they can obtain a livestock permit from the SD Department of Environment and Natural Resources.

Please feel free to contact me if you have questions about our training program.

Sincerely,

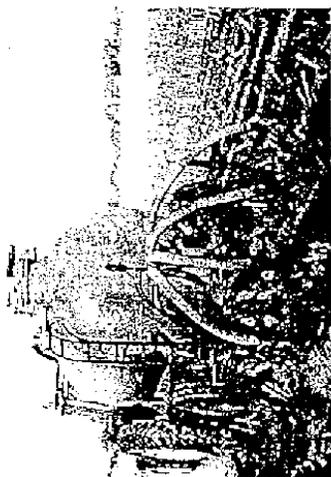
Charles H. Ullery
Extension Water and Natural Resources Specialist
Coordinator for Extension Manure Program

Creating Opportunities for a Lifetime

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South Dakota State University is an Affirmative Action/Equal Opportunity Employer (Male/Female) and offers all benefits, services, education and employment opportunities
without regard for ancestry, age, race, citizenship, color, creed, religion, gender, disability, national origin, sexual preference, or Vietnam Era veteran status.

Mission

This project will deliver a national curriculum and supporting educational tools to U.S. livestock and poultry industry information providers who in turn will help producers acquire certification and/or achieve environmentally sustainable production systems.



Curriculum

Introduction/General Issues
Principles of Environmental Stewardship
Risk and Regulatory Assessment Workbook
Managing Nutrients in Livestock Systems
Manure Processing Options
Emergency Action Planning

Land Application

Overview of Land Application Issues
Manure Utilization: Plans
Selecting and Managing Application Sites
Phosphorus and the Environment
Application Records and Sampling
Application Equipment

Outdoor Air Quality

Emissions from Animal Production Systems
Emission Control Strategies for Building Sources
Emission Control Strategies for Open Lots
Emission Control Strategies for Manure Storage
Emission Control Strategies for Land Application

Manure Storage Systems

Planning and Evaluating Manure Storage Units
Sizing Manure Storage Units
Manure Storage Construction Considerations
Operation and Maintenance Planning
Open Lot Runoff Management Options

Curriculum (continued)

Animal Dietary Strategies
Nutritional Strategies for Pigs
Nutritional Strategies for Poultry
Nutritional Strategies for Dairy
Nutritional Strategies for Beef Cattle



Audience

- ✓ Mandated environmental certification programs for producers and advisors
- ✓ Voluntary Cooperative Extension producer education programs
- ✓ Pro-active commodity group educational efforts
- ✓ Clientele training for NRCS EQIP and related stewardship programs.

Objectives

This project will

- ✓ Develop a nationally recognized, producer-oriented core curriculum targeting livestock and poultry manure management to protect soil, water, and air quality.
- ✓ Regionally review and pilot test this curriculum.
- ✓ Distribute this curriculum to producers and information providers through multiple, readily accessible delivery methodologies.

rev 10/99

Project Teams

Project Leaders:
Rick Koelsch
Frank Humenik

Project Manager:
Diane Huntrods

Author Team:

Brent Auvermann
Charles Pullage
Rick Grant
John Hoehne
Frank Humenik
Larry Jacobsen
Rick Koelsch
Jeff Lorimor
Todd Milton
Pat Murphy
Ron Sheffield
Donald Stetler
Theo van Kenpen

Review/Pilot Team:
Gary Jackson
Ted Funk
Denisse Meyer
Barry Kintzer
Richard Phillips
Mark Risse
Peter Wright
Carol Galloway
Rick Koelsch

Curriculum Access:
Don Jones
Jack Moore
Ginah Mortensen

Timeline

April 1999 Project is initiated.
1999-2000 Curriculum is developed and regionally reviewed.
2000-2001 Curriculum is pilot tested.
2001-2002 Information providers are trained, and curriculum is shared with organizations delivering it to producers.

More Information?

Rick Koelsch, University of Nebraska
213 Chase Hall, Lincoln, NE 68583-0726
Phone: 402-472-4051
E-mail: rkoelsch1@unl.edu

Frank Humenik, North Carolina State University
Box 7625, Raleigh, NC 27695-7625
Phone: 919-515-6767
E-mail: frank_humenik@ncsu.edu

Diane Huntrods, Midwest Plan Service
Iowa State University
122 Davidson Hall, Ames, IA 50011-3080
Phone: 515-294-2968
E-mail: huntrods@iastate.edu

Or any member of the Project Teams (see inside)



Livestock & Poultry Environmental Stewardship

A National Education Program for Producers

A collaborative effort of 14 land-grant universities, the EPA Ag Center, and the USDA with funding from EPA and USDA



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Manure Management Educational Materials Produced in Minnesota, 1995-2000

The following is a summary of manure management information that has been produced from a variety of sources in Minnesota from 1995 through 2000. Many of these items have been reproduced through subsequent revisions as more information becomes available. In addition a number of items have become outdated or obsolete without revision. The obsolete items are indicated.

The purpose for providing this summary is to show the significant development of manure management informational materials in recent years. This public investment in educational efforts is continually evolving. Once developed and placed into distribution, it can be difficult to modify and redistribute. Therefore, it was proposed that the training materials be developed in an electronic format to be easily adaptable over time. An initial public investment in the delivery technology would allow content changes to be incorporated in the materials (and an exam) as they occur. This would result in a long term costs savings to the participant and provider of the certification program.

A "Self Screening" Assessment Method: Determining the Appropriateness of a Manure Digestion System on an Animal Production Facility, Environomics, AURI, Web page, 8,
<http://www.auri.org/research/digester/digester.htm>

Final Report "Evaluation of Commercial Manure Additives", Jack Johnson, AURI, Report 29, T, October 1, 1997
Lake Superior Basin Plan Timeline, DNR, Web page, 5, F, September 22, 2000
<http://www.pca.state.mn.us/water/basins/superior/pubs/lspb-timeline.pdf>

State of Minnesota Nonpoint Source Pollution Existing Controls and Programs, Lake Superior Watershed Report, DNR/MPCA, Report, May 1995.
<http://www.pca.state.mn.us/water/basins/superior/pubs/sd-chapter4.pdf>

This link is for Chapter 4 and has a section on agriculture including a section titled "Confined Animal Facility Wastewater and Runoff (Large and Small Units)

1999 Certified Manure Testing Laboratories, Jan Jarman, MDA, Factsheet, 2, F, 1999.
<http://www.mda.state.mn.us/DOCS/AGRON/AGRONOMY/99MANLAB.HTM>

Animal Mortality Composting, MDA, Brochure, 2, T, July 1999

Assessing the Soil System -- A Soil Quality Literature Review, Ann Lewandowski, Mark Zumwinkle, MDA Book, 65, T, June 1999

Feedlot and Manure Management Directory, MDA, Book, 48, T, March 1997

Greenbook: Marketing Sustainable Agriculture, Energy and Sustainable Agriculture Program, MDA, MDA Book, 160+, T, Every year

Manure Application Requirements, Rick Hansen, MDA, Web page, July 20, 2000,
<http://www.mda.state.mn.us/appd/cawt/>

Manure Management Alternatives: A Supplemental Manual, Woodward-Clyde Consultants, MDA, Book 51, T, July 1995

Manure Planning Guide for Livestock Operators, Kathy Reichow, MDA, Book 59+, T, May 1995

Planning & Zoning for Animal Agriculture in Minnesota: A Handbook for Local Government, James Duncan and Associates, MDA, Book, 100+, T, June 1996

Swine Manure Application Guide, MDA, Laminated, 2, F, February 1995 (obsolete)

Useful Nutrient Management Data, MDA, Laminated, 2, F (obsolete)

A Soil Nitrogen Test Option for n Recommendations with Corn, M.A. Schmitt, G.W. Randall, & G.W. Rehm, MES, Factsheet, 6, T, 1998, FO-6514-GO.
<http://www.extension.umn.edu/distribution/cropsystems/DC6514.html>

- Best Management Practices for Nitrogen Use in East-Central and Central Minnesota*, M.A. Schmitt & G.W. Randall, MES, Factsheet, 4, T, 1998, FO-6129-GO, <http://www.extension.umn.edu/distribution/cropsystems/DC6129.html>
- Best Management Practices for Nitrogen Use in Northwestern Minnesota*, M.A. Schmitt, J.A. Lamb, and G.W. Randall, MES, Factsheet, 4, T, 1995, FO-6130-GO. <http://www.extension.umn.edu/distribution/cropsystems/DC6130.html>
- Best Management Practices for Nitrogen Use in South-Central Minnesota*, G.W. Randall and M.A. Schmitt, MES, Factsheet, 7, T, 1993, FO-6127-GO. <http://www.extension.umn.edu/distribution/cropsystems/DC6127.html>
- Best Management Practices for Nitrogen Use in Southeastern Minnesota*, G.W. Randall and M.A. Schmitt, MES, Factsheet, 4, T, 1998, FO-6126-GO. <http://www.extension.umn.edu/distribution/cropsystems/DC6126.html>
- Best Management Practices for Nitrogen Use in Southwestern and West-Central Minnesota*, G.W. Randall and M.A. Schmitt, MES, Factsheet, 7, T, 1993, FO-6128-GO. <http://www.extension.umn.edu/distribution/cropsystems/DC6128.html>
- Best Management Practices for Nitrogen Use on Irrigated, Coarse Textured Soils*, M.A. Schmitt, G.W. Randall, and G.L. Malzer, MES, Factsheet, 4, T, 1994, DC-6131-GO. <http://www.extension.umn.edu/distribution/cropsystems/DC6131.html>
- Best Management Practices for Nitrogen Use Statewide in Minnesota*, G.W. Randall and M.A. Schmitt, MES Factsheet, 7, T, 1993, AG-FO-6125-C
- Category Liquid Commercial Animal Waste Technician Training Manual*, Emmy Reppe, MES, Book, T, July 1999
- Category Solid Commercial Animal Waste Technician Training Manual*, Emmy Reppe, MES, Book, T, July 1999
- Developing a Manure Management Plan*, Dennis Busch, Lowell Busman, and Phil Nesse, MES, Booklet, T, 1998, BU-6957-GO. <http://www.extension.umn.edu/distribution/cropsystems/DC6957.html>
- Environmental Quality Incentives Program (EQIP) Education*, MES, Web page, T, <http://www.extension.umn.edu/mnimpacts/impact.asp?projectID=1029>. Describes the EQIP program.
- Estimating Manures' Fertilizer Replacement Value*, Dennis L. Busch, Phil Nesse, and Lowell Busman, MES Factsheet, 6, T, 1998, FO-7197-C.
- Fertilizing Corn in Minnesota*, George Rehm, Michael Schmitt, and Roger Eliason, MES, Factsheet, 8, T, 1996, FO-3790-C.
- Fertilizing Cropland with Beef Manure*, Michael Schmitt and George Rehm, MES, Factsheet, 6, F, 1998, FO-5882-GO. <http://www.extension.umn.edu/distribution/cropsystems/DC5882.html>
- Fertilizing Cropland with Dairy Manure*, Michael Schmitt and George Rehm, MES, Factsheet, 6, F, 1998, FO-5880-GO. <http://www.extension.umn.edu/distribution/cropsystems/DC5880.html>
- Fertilizing Cropland with Poultry Manure*, Michael Schmitt and George Rehm, MES, Factsheet, 6, F, 1995, FO-5881-GO. <http://www.extension.umn.edu/distribution/cropsystems/DC5881.html>
- Fertilizing Cropland with Swine Manure*, Michael Schmitt and George Rehm, MES, Factsheet, 6, F, 1998, FO-5879-GO.
- Livestock Manure Sampling and Testing*, Tim Wagar, Mike Schmitt, Chuck Clanton, and Fred Bergsrud, MES, Factsheet, 4, F, 2000, FO-6423-GO. <http://www.extension.umn.edu/distribution/cropsystems/DC6423.html> (obsolete)
- Manure is a Good Source of Nitrogen*, Thomas D. Legg and K. William Easter, MES, Factsheet, 7, T, 1992, FO-5760-GO. <http://www.extension.umn.edu/distribution/cropsystems/DC5760.html>
- Manure Management in Minnesota*, Michael A. Schmitt, MES, Factsheet, 6, T, 1999, FO-3553-GO. <http://www.extension.umn.edu/distribution/cropsystems/DC3553.html> (obsolete)
- Manure Management Practices for the Minnesota Pork Industry*, Larry D. Jacobson and David R. Schmidt, MES, Factsheet, 4, T, 1994, FO-6456-GO. <http://www.extension.umn.edu/distribution/livestocksystems/DI6456.html>

Profit With Manure, MES, Videotape, VH-6082

Providing Proper N Credit for Legumes, Mike O'Leary, George Rehm, Michael Schmitt, MES, Factsheet, 4,F, 1990, AG-FO-3769-C.

Self Assessment Worksheets for Manure Management Plans, Michael A. Schmitt, MES, Factsheet, 9, F, 1994, FO-5883-C. (obsolete)

The Nature of Phosphorus in Soils, Lowell Busman, John Lamb, Gyles Randall, George Rehm, and Michael Schmitt, MES, Factsheet, 4, T, 1998, FO-6795-GO.
<http://www.extension.umn.edu/distribution/cropsystems/DC6795.html>

Treatment and Disposal of Milk House and Milking Parlor Wastes, Donald W. Bates and Roger E. Machmeier, MES, Factsheet, 10, T, 1985, BU-1321-GO
<http://www.extension.umn.edu/distribution/livestocksystems/DI1321.html> (obsolete)

Understanding Nitrogen in Soils, Mike O'Leary, George Rehm and Michael Schmitt, MES, Factsheet, 4, T, 1994, FO-3770-GO. <http://www.extension.umn.edu/distribution/cropsystems/DC3770.html>

Nutrient Management Planner, MES/NRCS, Software, T, 2000

Composting: A Method of Dead Animal Disposal in Minnesota, MN Board of Animal Health, Brochure, 2, T

1,000 or More Animal Units: Construction and Expansion, MPCA, Factsheet, 2, F, November 8, 2000
<http://www.pca.state.mn.us/publications/fl-06.pdf>

1,000 or More Animal Units: Operation and Management, MPCA, Factsheet, 3, F, November 8, 2000
<http://www.pca.state.mn.us/publications/fl-05.pdf>

300 to 999 Animal Units: Construction and Expansion, MPCA, Factsheet, 2, F, November 8, 2000
<http://www.pca.state.mn.us/publications/fl-04.pdf>

300 to 999 Animal Units: Operation and Management, MPCA, Factsheet, 3, F, November 8, 2000
<http://www.pca.state.mn.us/publications/fl-03.pdf>

Citizen Environmental Lawsuits, MPCA, Factsheet, 3, F , July 1997, 37
<http://www.pca.state.mn.us/water/pubs/feedlot37.pdf>

Closure and Abandonment of Manure Storage Structures, MPCA, Factsheet, 2, F, July 1997, 23
<http://www.pca.state.mn.us/water/pubs/feedlot23.pdf>

Completing a MPCA Feedlot Permit Application, MPCA, Factsheet (obsolete)

Completing a MPCA Feedlot Permit Application Supplement, MPCA, Factsheet (obsolete)

Data on Feedlot Permits Issued in Minnesota, MPCA, Web page, 1, T
<http://www.pca.state.mn.us/hot/fl-permits.html>

Draft General Livestock Production Permit, MPCA, PubNot, 37, F, December 4, 2000
<http://www.pca.state.mn.us/news/publicnotice/pn120400-fl-gpermit.pdf>. Public notice issued: 12/04/2000. Last day to submit comments: 01/19/2001. Applies to: NPDES/SDS permits.

Factsheet for the State of Minnesota General Livestock Production Permit, Chris Lucke, MPCA, Factsheet, 5, F, December 4, 2000, <http://www.pca.state.mn.us/news/publicnotice/pn120400-fl-factsheet.pdf>. Public notice issued: 12/04/2000. Last day to submit comments: 01/19/2001. Applies to: NPDES/SDS permits.

Feedlot Air Quality Summary: Data Collection, Enforcement and Program Development, James Sullivan, MPCA Report, 46, T, March 1999. <http://www.pca.state.mn.us/hot/pubs/feedlot-aq.pdf>

Feedlot Hydrogen Sulfide Initiative, MPCA, Factsheet, 2, F, February 1997
<http://www.pca.state.mn.us/hot/pubs/legfswq5.pdf>

Feedlot Issues: Animal Waste Liability Account, Incident Reporting and Contingency Action Plan: Legislative Report (1/99), MPCA, Report, 64, February 1999
<http://www.pca.state.mn.us/hot/legislature/reports/1999/feedlot-rpt.pdf>

Feedlot Permit Application Process, MPCA, Factsheet, 2, F, July 1997, 35
<http://www.pca.state.mn.us/water/pubs/feedlot35.pdf> (obsolete)

General Feedlot Program Information, MPCA, Factsheet, 6, F, February 1997, 33
<http://www.pca.state.mn.us/water/pubs/feedlot33.pdf> (obsolete)

Geomembranes as a Liner for Manure Storage Structures, MPCA, Factsheet, 2, F, July 1997, 34
<http://www.pca.state.mn.us/water/pubs/feedlot34.pdf>

Livestock Odor FAQ, MPCA, Web page, <http://www.pca.state.mn.us/hot/fl-odor.html>

MPCA Concrete Manure Storage Pit Requirements, MPCA, Factsheet (obsolete)

MPCA Earthen Manure Storage Basin Requirements, MPCA, Factsheet (obsolete)

MPCA Feedlot Permit Program Overview, MPCA, Factsheet, 2, F, January 1998
<http://www.pca.state.mn.us/hot/pubs/leg98wq7.pdf> (obsolete)

MPCA Soil Boring Requirements, MPCA, Factsheet (obsolete)

NPDES/SDS Permits--Permitting Process for Surface-water Dischargers, MPCA, Factsheet, 3, F, October 2000
<http://www.pca.state.mn.us/publications/wq-wwprm1-02.pdf>

Permit Application Requirements for Manure Composting Facilities, MPCA, Factsheet, 1, F, July 1997, 14
<http://www.pca.state.mn.us/water/pubs/feedlot14.pdf> (obsolete)

Public Notice of Intent to Issue State of Minnesota General Livestock Production Permit, Chris Lucke, MPCA, PubNot, 3, F, December 4, 2000 <http://www.pca.state.mn.us/news/publicnotice/pn120400-fl-pn.pdf>
Public notice issued: 12/04/2000. Last day to submit comments: 01/19/2001. Applies to: NPDES/SDS permits.

Report to the Legislature on the Minnesota Pollution Control Agency's Ability to Meet 60-day Issuance Deadline for Feedlot Permits, MPCA, Report, 40, T, November 15, 2000
<http://www.pca.state.mn.us/hot/legislature/reports/2001/feedlotpermits.pdf>

Minnesota Rules, Chapter 7020 Feedlot Regulations, MPCA, Web page,
<http://www.pca.state.mn.us/hot/feedlot-rules.html> (obsolete)

State by State Comparison of Animal Manure Regulations, MPCA, Web page, 1, F, May 4, 1998
<http://www.pca.state.mn.us/hot/fl-statecomp.html>

Statement of Need and Reasonableness in the Matter of Proposed Amendments to Minnesota Rules 7001, 7002 and 7020 Relating to Animal Feedlots, Storage, Transportation, and Utilization of Animal Manure, MPCA, Rule, 286, December 8, 1999. <http://www.pca.state.mn.us/news/publicnotice/sonar-7020.pdf>

Under 300 Animal Units: Construction and Expansion, MPCA, Factsheet, 2, F, November 8, 2000
<http://www.pca.state.mn.us/publications/fl-02.pdf>

Under 300 Animal Units: Operation and Management, MPCA, Factsheet, 3, F, November 8, 2000
<http://www.pca.state.mn.us/publications/fl-01.pdf>

Unpermitted Earthen Basins, MPCA, Factsheet, 2, F, July 1997, 36
<http://www.pca.state.mn.us/water/pubs/feedlot36.pdf> (obsolete)

Agricultural Waste Management Field Handbook, NRCS, Book, T

Comprehensive Nutrient Management Planning Technical Guidance, NRCS, Web page, 64, F, December 1, 2000
<http://www.nhq.nrcs.usda.gov/PROGRAMS/ahcwpd/ahCNMP.html>

Nutrients Available from Livestock Manure Relative to Crop Growth Requirements, Charles H. Lander, David Moffitt, and Klaus Alt (retired), NRCS, Web page, T. <http://www.nhq.nrcs.usda.gov/land/pubs/nlweb.html>

Animal Feedlot Regulation, OLA, Report, 113, T, January 28, 1999, 99-04
<http://www.auditor.leg.state.mn.us/ped/1999/pe9904.htm>

Alternative Waste Management Systems, C.J. Clanton, UofM, Web page
<http://www.bae.umn.edu/extens/manure/landapp/wasteman.html>

Manure Application Planner (MAP), UofM, Software. <http://www.cffm.umn.edu/Software/Map/default.htm>
(obsolete)