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July 3, 2013

Jeff Prier
Iowa Department of Natural Resources
Field Office 6
1023 West Madison St.
Washington, IA 52353-1623

Dear Mr. Prier:

Per cooperative agreement number ESD7427JPRIER130016, between the Iowa Department of Natural Resources and Iowa State University Extension and Outreach, attached is a copy of the FY2013 Manure Applicator Certification final project report. The project report covers the period from July 1, 2012 to June 30, 2013. A copy of the final report will also be made available electronically at: <http://www.agronext.iastate.edu/immag/mac.html>.

Also enclosed is copy of each of the training dvds per our contract requirements and a copy of a program CD with program modules and handouts.

If you have any questions regarding this report please feel free to contact me. I look forward to a continued relationship on this project.

Sincerely,



John D. Lawrence
Associate Dean, Extension Programs and Outreach
Director, Agriculture & Natural Resources Extension

Enc.

c. Angela Rieck-Hinz
Rachel Klein
Linda Wilson

Manure Applicator Certification Program
July 1, 2012 to June 30, 2013
Agreement Number ESD7427JPRIER130016
Final Report

Introduction

In 1998, the Iowa Legislature passed HF 2494. This bill required certification of commercial manure applicators and confinement site manure applicators with operations of a designated size. Legislative changes (HF 644) again in 2003 required rule changes for the 2004 program. These changes primarily dealt with the administrative changes to the commercial manure applicator program. The new law required manure application businesses to hold business licenses and allowed fees to be set for businesses, managers and employees. The purpose of this project, entered into by the Iowa Department of Natural Resources (IDNR) and Iowa State University Extension (ISUE) was to develop manure certification training and testing materials and to conduct certification workshops for commercial manure applicators and confinement site manure applicators. This annual report covers year 16 of the certification program.

Training Material Development

Confinement Site Manure Applicator Program

Training materials for the confinement site programs were developed into individual modules. The goal of the module concept was that the material could be used again in future programs with minimal time used in development of the presentation of the materials but instead, time focused on updating the subject matter of each module for future use. The modules were identified from email discussion and ideas submitted by Extension Field Specialists and input from the Manure Applicator Certification Advisory Committee. An Extension campus and/or field specialist or IDNR staff member then develops and presents each module. For some modules, other speakers are identified and asked to participate in the program. The materials are developed into a PowerPoint presentation or a video segment and then burned onto a CD for use at the annual workshops. Each module may be modified at the local level by Extension Field Specialists to adapt for regional or county use to meet certain manure application practices, crop, soils, or topography requirements. For some meetings, field specialists develop a “clicker” presentation to help better engage the audience.

A list of modules by year, from 2008-2013 is presented in Table 1(a complete list of modules by year from 2001-2013 is available upon request).

Commercial Manure Applicator Program

Materials developed for the 2013 Commercial Manure Applicator program were discussed and determined during the annual advisory committee meeting, via email and phone discussions with Extension Field Specialists, IDNR staff and members of the Manure Applicator Certification Advisory Committee and several commercial manure

applicators. The program materials were delivered by pre-recorded video segments at the annual coordinated showing of the Manure Applicator Certification program which was held on January 4, 2013. A list of modules by year, from 2008-2013 is presented in Table 1(a complete list of modules by year from 2001-2013 is available upon request).

Dry Manure Applicator Program

This program is a subset of the commercial manure applicator and confinement site applicator program. The program is designed to meet the training requirements of both types of applicators, but focuses more on dry manure issues and handling. A list of modules for 2013 is included in Table 1.

Table 1. Certification modules developed and presented at training meetings by program and year.

Year	Confinement Site Manure Applicator Program	Commercial Manure Applicator Program
2008	DNR Land Application Rules, Separation Distances and Manure Management Plans 25 Minutes	DNR Land Application Rules, Separation Distances, Spill Training 30 Minutes
	Emergency Mortality Management 27 minutes (Glanville DVD)	DOT Regulations/Weight Restrictions 30 minutes Chris Boswell
	Confinement Site Investigation Scenarios 50 minutes	Review of Land Application Issues from past 10 years 20 minutes Karen Grimes
		DNR Case Studies on Manure Spills and Spill Response 25 minutes Ted Peterson
		Injector effects on soil, odor, residue and manure 35 minutes, (Hanna Video)
2009	Valuing, Pricing and Selling Manure 60 minutes	DNR Land Application Rules, Separation Distances and Manure Management Plans 40 minutes
	Hydrogen Sulfide Safety During Deep-Pit Pump out 25 min (Swestka/Burns DVD)	Economics of Hauling Manure (Leibold video) 33 minutes
	DNR Land Application Rules, Separation Distances and Manure Management Plans 35 min	Hydrogen Sulfide Safety During Deep-Pit Pump out 25 minutes (Swestka/Burns video)
		Road Safety and Personal Protective Gear 60 minutes
		Mole Toolbar (video) 15 minutes
2010	Review of Rules, Land Application Separation Distances, MMP Requirements, Winter Application, Stockpiling Regulations, Paperwork, Fees and Recordkeeping Requirements 60 minutes	DNR Land Application Rules, Separation Distances, Winter Application Rules, Water Quality Impacts, Spill Response, Paperwork, Fees and Recordkeeping Requirements. 60 minutes
	How to Interpret your Manure Analysis 30 Min	
	Pit Explosions, Fires and Foaming 15 Min	Commercial Application of Manure: Case Studies and Tips for dealing with Liability Issues. 35 minutes
	Liquid Dairy Case Study 15 minutes	Drag Hose/Rupture Video 6 minutes
		Infiltration of Manure, Movement to Tiles and Ways to Minimize Risk of Rapid Export from tile 40 minutes
		Safety and Spill Response Trailer Video 10 minutes
		Pump Safety Video 13 min
		Q and A Panel Discussion 20 Min

	Dry Manure Program	
	Review of Rules, Land Application Separation Distances, MMP Requirements, Winter Application Rules, Paperwork, Fees and Recordkeeping Requirements 60 Min.	
	Stockpiling Regulations 40 Min	
	Transport of N and P to Subsurface Drain Water under Layer Hen Manure-Applied Field Plots 60 min	
	Q and A 20 Min	
2011	Review of Rules, Land Application Separation Distances, MMP Requirements, Winter Application, Stockpiling Regulations, Paperwork, Fees and Recordkeeping Requirements 44 min (Prier)	DNR Land Application Rules, Separation Distances, Winter Application Rules, Paperwork, Fees and Recordkeeping Requirements. 45 minutes (Prier)
	Frozen Ground and Winter Application Rules 17 min (Prier)	Manure Nitrogen Availability and Supply 49 min (Sawyer)
	Manure Nitrogen Availability and Supply 49 min	Water Quality Impacts and Spill Response 25 min (Wiklund)
	Video segment of Safety Pumping from Deep Pits 15 min (Arora and Harmon)	Frozen Ground and Winter Application Rules 17 min (Prier)
		Update on Foaming Pits Research 28 min (Schmidt)
		Video segment of Safety Pumping from Deep pits 15 min (Arora and Harmon)
		Frequently Asked Questions 15 min (Rieck-Hinz)
	Dry Manure Program	
	Review of Rules, Land Application Separation Distances, MMP Requirements, Winter Application Rules, Paperwork, Fees and Recordkeeping Requirements 42 Min. (Rieck-Hinz)	
	Frozen Ground Winter Application Rules 17 min (Prier)	
	Manure Nitrogen Availability and Supply 49 min (Sawyer)	
	Stockpiling Regulations 25 min (Rieck-Hinz)	
	Water Quality Impacts and Spill Response 25 min (Wiklund)	
	Frequently Asked Question 15 min (Rieck-Hinz)	
2012	Confinement Site Manure Applicator Program	Commercial Manure Applicator Program
	Review of Rules, Land Application Separation Distances, MMP Requirements, Winter Application, Stockpiling Regulations, Paperwork, Fees and Recordkeeping Requirements 50 (Prier)	DNR Land Application Rules, Separation Distances, Winter Application Rules, Paperwork, Fees and Recordkeeping Requirements. 45 min (Prier)
	Winter Application of manure or not 25 min (Terry Steinhart)	Infiltration of manure, movement to tiles, and ways to minimize risk of rapid export from tiles and runoff pathways 40 min (Matt Helmers)
	Motor Vehicle Enforcement IDOT 17 min (Chris Boswell)	Motor Vehicle Enforcement IDOT 17 min (Chris Boswell)
	Determining when your MMP is Due 13 min (Rieck-Hinz)	Road Damage Study 48 min (Kevin Erb)
		Beef and Poultry Manure Phosphorus Water Quality Issues 31 min (Antonio Mallarino)
	Dry Manure Program	
	Review of Rules, Land Application Separation Distances, MMP Requirements, Winter Application Rules, Paperwork, Fees and Recordkeeping Requirements 50 Min. (Rieck-Hinz)	
	Bulk Dry Animal Nutrient Chapter 200A 30 min (Kevin Klommhaus)	
	Beef and Poultry Manure Phosphorus Water Quality Issues 31 min (Antonio Mallarino)	
	Motor Vehicle Enforcement IDOT 17 min (Chris Boswell)	
	Road Damage Study 51minutes (Kevin Erb)	

2013	Confinement Site Manure Applicator Program	Commercial Manure Applicator Program
	Intro and Program Reminders, Paperwork and Fees, A. Rieck-Hinz 4 min	Intro and Program Reminders, Paperwork and Fees, A. Rieck-Hinz 6 min
	Intro to Nutrient Reduction Strategy, J. Lawrence 4 min	Land Application Rules, Separation Distances, Recordkeeping, Winter Application J. Prier 52 min
	Nutrient Reduction Strategy Science Assessment, M. Helmers, 44 min	Iowa Commercial Manure Applicator Certification Training Legal Liability, E. McAfee, 24 min
	Manure and Nutrient Movement in Soils. D. Andersen, 27 min	Intro to Nutrient Reduction Strategy, J. Lawrence, 4 min
	Land Application Rules, Separation Distances, Recordkeeping, Winter Application Laws, MMPs, J. Prier, 40 min	Nutrient Reduction Strategy Science Assessment, M. Helmers, 44 min
		Iowa One-Call, K. Gregorich, 16 min
		Manure and Nutrient Movement in Soils, D. Andersen, 27 min
		Top Ten List on How to Prevent Manure Spills, R. Rausch and B. Jochum, 10 min
		ICNAA Membership 4 min
	Dry Manure Applicator Program	
	Rules, Separation Distances, Recordkeeping Requirements, Signage, Stockpiling and Spill Reporting. A. Rieck-Hinz 50 min	
	Interpreting and Using Manure Test Results, J. DeJong, 40 min	
	Intro to Nutrient Reduction Strategy, J. Lawrence, 4 min	
	Nutrient Reduction Strategy Science Assessment, M. Helmers, 44 min	
	Manure and Nutrient Movement in Soils, D. Andersen, 27 min	

Supporting Training Materials

The three stockpiling regulation factsheets, which were developed by the DNR for the FY12 program, were included in this year's program. The factsheets were developed to help producers better protect the water around their farms and help guide them with stockpiling regulations. The three factsheets were animal housing specific: *Confinement Dry Manure Stockpiling Regulations*, *Dry-Bedded Manure Stockpiling Regulations*, and *Open Feedlot Manure Stockpiling Regulations*. One more factsheet was added this year; *How to Interpret Your Manure Analysis*. The fact sheets were made available to all workshop attendees at the dry manure certification workshops. The copies of existing DNR 113, and the new versions of DNR 115, and DNR 116 were also distributed at all workshops and video trainings.

Certification Workshops

Confinement Site Workshops

Training workshops for the 2013 Confinement Site Manure Applicator Certification program began in January 2013 and continued through February 2013. There were a total of 66 training workshops scheduled, but due to weather one workshop was eventually canceled after being rescheduled twice. Confinement site applicators could also meet training requirements by watching a two-hour DVD at their local County Extension office.

ISU Extension and Outreach staff has reported 1,305 confinement site applicators attended the certification workshops, while ISUEO has collected 1,173 confinement site application evaluations. The 2013 Confinement Site program was presented by 16 Field Specialists including: 5 Agricultural and Biosystem Engineers, 11 Agronomists, and 1 Campus Specialist.

There was also a confinement site certification workshop at the 2013 Iowa Pork Congress in which 7 people attended. A workshop was also conducted on February 26, at the National Animal Disease Center for staff working with animals and manure. Twenty four people attended that workshop. The DNR requires staff at NADC meet certification requirements.

Commercial Applicator Workshops

A coordinated statewide “reshow” of the commercial manure applicator program was offered on September 5, 2012. This was not a live event, but an event where the county offices held a “reshow” of the training DVD on a coordinated date and time. This event was held in 38 County Extension offices. The goal in offering this reshow was to reduce the number of times the county staff offered the commercial program in the fall. We know that most commercial applicators will wait until immediately prior to fall application season starts to get new employees certified, so by offering this coordinated event, it helps us to maximize training and staff time. Although the August “reshow” was the DVD program from the January 2012 event, it technically occurs in the new fiscal year and was included in this report. This event was publicized through press releases and information coming directly from commodity groups. .

The 2013 Commercial Manure Applicator program was delivered via coordinated showing on January 4, 2013. This showing was presented in 69 Iowa County Extension offices, and one Wisconsin County office. A total of 18 applicators attended the Wisconsin County office meeting.

The ISU Extension and Outreach staff has reported 938 commercial applicators attended the certification meetings, while ISUEO has collected 1,192 commercial applicators evaluations as of the date of this report.

According to the IDNR database, both of the Commercial and Confinement site programs have increased in the number of applicators compared to the past years. The number of currently certified commercial manure applicator businesses has stayed the same at 544. The number of currently certified Commercial manure applicator representatives on the other hand has increased. In 2012, there were a total of 2,013 certified commercial manure applicator representatives compared to 2,102 for this year (by the end of June). The number of certified confinement site applicators in 2012 was 2,097 and current (June 30, 2013) there are 2,212 with approximately 478 applicators who will need training to keep their certification current.

Dry Manure Workshops for Commercial and Confinement Site Applicators

In February, seven dry manure applicator workshops were scheduled in the state of Iowa.

Date	Location	Attendance
February 5, 2013	Thompson	27
February 6, 2013	Orange City	35
February 14, 2013	Ellsworth	21
February 15, 2013	Clarion	28
February 18, 2013	Washington	18
February 19, 2013	Greenfield	18
February 28, 2013	Storm Lake	38

The workshops provided the necessary three hours of training for the commercial applicators and subsequently met the required time requirements for confinement site applicators. The topics for the workshops were: land application rules, stockpiling requirements, interpreting and using manure test results, introduction to Nutrient Reduction Strategy and the Science Assessment, and manure and nutrient movement in the soil.

In addition to the regularly scheduled dry workshop listed above, ISU Extension and Outreach provided training for one private company, Natural Fertilizer Service from Woodbine, IA. A total of 53 people attended, 6 confinement site applicators and 47 commercial manure applicators.

Certification Workshop Evaluation

2013 Commercial Manure Applicator Program Evaluation

An evaluation form was created for the Commercial Manure Applicators pertaining to the material given during the certification process. At the end of each workshop and at the end of each DVD, the applicators were asked to complete an evaluation on the information presented, overall evaluation of the program, and then the managers or business owners were asked:

What kind of manure injection/incorporation equipment are you using?

<u>Kind of Equipment</u>	<u>Yes</u>	<u>No</u>	<u>No Response</u>	<u>Total Response</u>
a. Disc Covering Units	287	9	896	1,192
b. Knife	285	9	898	1,192
c. Wide Shank	86	17	1,089	1,192
d. Harrow	21	15	1,156	1,192

The following question was asked to the applicators who apply liquid manure:

What type of equipment do you use for liquid application?

<u>Type</u>	<u>Response</u>	<u>Percentage</u>
a. Tank	461	39%
b. Drag-Hose	102	9%
c. Both	103	9%
d. Irrigation	9	1%
e. No Response	<u>517</u>	43%

Total Response 1,192

2013 Confinement Site Program Evaluation

Evaluation forms were created with new questions for the applicators pertaining to the material given during the certification process. At the end of each workshop and at the end of each DVD, the applicators were asked to complete an evaluation on the information presented, overall evaluation of the program, and manure management and equipment used. The following were the responses to selected questions in the 2013 Confinement site program:

On average, how many pounds of total nitrogen as manure do you apply per acre?

Amount	Responses	Percentage
Less than 100 lbs N/ac	131	11%
101-125 lbs N/ac	228	19%
126-150 lbs N/ac	263	22%
151-175 lbs N/ac	242	21%
176-200 lbs N/ac	181	15%
Greater than 200 lbs N/ac	23	2%
No Response	103	9%
Does not apply	2	0%
Total Responses	1,173	

On average, on how many acres do you apply manure?

8. On average, on how many acres do you apply manure?	Number of Responses
0 acres	7
1 to 500 acres	714
550 to 1,000	192
1,100 to 1,500	48
1,600 to 2,000	20
2,100 to 2,500	11
2,600 to 3,000	1
3,100 to 3,500	3
3,600 to 4,000	0
4,100 to 4,500	0
4,600 to 5,000	1
5,100 to 5,500	0
5,600 to 6,000	0
6,100 to 6,500	0
6,600 to 7,000	1
15,000	2

Does not apply--just hauling	2
No response	169
Varies/Depends	2
Total	1,173

What kind of manure injection/incorporation equipment are you using?

Disc covering units	378
Knife	408
Wide Shank	94
Harrow	19
Other	48
None, I surface apply	77
No Responses	88
No incorporation	41
Within 24 hours	95
Within 48 hours	5
Within 7 days	2
After more than 7 days	6

Complete results of program surveys can be found at: <http://www.agronext.iastate.edu/immag/maceval.html>. These results are continuously updated as we receive evaluations from County Extension offices. Evaluations from previous years are also available at this site.

Advisory Committee

The 2013 MAC advisory committee gathered on August 28, 2012, at the Iowa Turkey Federation Boardroom. Members in attendance included: Dan Andersen, Kapil Arora, John Holmes (phone), Dan Huyser (phone), Rachel Klein, Kris Kohl, Tom Miller(phone), Angie Rieck-Hinz, John Sawyer, all ISU staff; Tyler Bettin, IPPA; Gretta Irwin, Iowa Turkey Federation; Rich Rausch(phone), ICNAA; Jeff Prier, Karen Grimes, and Colleen Zeliadt(Phone), IDNR. Introductions were done, the group toured the IMMAG website, and handouts were given to the committee members. The committee reviewed the 2012 program year, discussed program ideas, and training materials for the 2013 program year.

Promotional Materials

Promotional materials used in the 2013 Manure Applicator Certification programs were similar to that of previous years. A press release was developed and distributed announcing the commercial applicator reshaw on September 5, 2012. The commodity

organizations and ICNAA also helped to advertise the September reshow via email distribution and newsletters. Postcards were developed for the January 2013 Commercial program and a brochure was developed for the Confinement Site program to be used as an informational and recruitment tool. Copies of the postcard and brochure were mailed to all currently certified commercial manure applicator businesses and confinement site applicators in December 2012.

Again this year, postcard templates were designed for use by the County Extension offices to remind the Confinement Site Applicators of the upcoming workshops in their area. A set of instructions on how to use the templates was also posted to the MAC "For Staff" Web page. Copies of all brochures and postcards used for recruitment purposes can be found on the enclosed CD titled "ISUEO 2013 MAC Program Applicator Training Materials".

A total of six press releases were prepared and used by County Extension offices for local media. A copy of those press releases can be found in Appendix 1. Workshop dates were maintained on the MAC section of the IMMAG web site (<http://www.agronext.iastate.edu/immag/mac.html>) and were also linked on the Iowa Pork Industry Center's web page <http://www.ipic.iastate.edu/pastevents13.html>. A list of workshop dates was distributed to attendees at the Iowa Pork Congress in January 2013. An article was prepared and distributed through the November 2012 *Iowa Pork Producer* Magazine (p. 28) found at <http://www.iowapork.org/FileLibrary/States/IA/News/Magazine/Nov%202012%20Mag.pdf>. In addition; livestock commodity groups were provided with information regarding training opportunities that they used in their monthly email newsletters to their members.

All of the public certification materials have been distributed electronically through the IMMAG site. The Manure Applicator Certification Program button on the IMMAG site links users to a site solely devoted to the Certification Program (<http://www.agronext.iastate.edu/immag/mac.html>). The site contains a description of who needs to be certified, how to get certified and a list of questions and answers most commonly received about the program. The site also has a "staff only" link for ISU Extension and Outreach employees to download program-planning materials. This site serves as the primary location for MAC information in the state of Iowa.

Reporting Requirements

This contract requires quarterly reports and a final project report. This document serves as the final project report. The quarterly reports were submitted to the Iowa Department of Natural Resources point of contact, Jeff Prier, via email on October 26, 2012, January 11, 2013; April 15, 2013 and June 27, 2013.

Partnerships

For FY12 the normal partnerships with IDNR, members of ICNAA, ITF, IPPA, ICA, ISDA and IPA were maintained. This year we also partnered with Iowa One Call to be able to instruct applicators on requirements for digging when they address manure spills. This

issue has been a point of concern when applicators are told how to address manure spills that require moving large amounts of soil to make berms, or to clean out road ditches.

Future Needs

Fiscal year 2013 continues to show an increase in the number of both confinement site and commercial manure applicators. This is reflected by attendance at our workshops, video showings and by the number of applicators who have met training requirements by the end of the fiscal year. This increase in numbers may warrant exploring new or additional means of providing certification training.

Additional items to consider include developing a policy for training requirements. It is likely that other entities will continue to want to provide opportunities for training. It is not ISU's decision on if or how this happens, but DNR should consider developing a policy that outlines the expectations and requirements of this program.

Budget

A copy of the budget expenditures as of June 30, 2013, is provided via the ISU Office of Sponsored Programs.

Appendix 1. Press Releases

Statewide Training Session for Commercial Manure Applicators Scheduled for Sept 5

<http://www.extension.iastate.edu/news/forstaff/2012/aug/160801.htm>

Confinement Site Manure Applicator Workshops Scheduled for 2013

<http://www.extension.iastate.edu/article/confinement-site-manure-applicator-workshops-scheduled-2013>

2013 Confinement Site Manure Applicator Training Scheduled in -- County

<http://www.extension.iastate.edu/news/forstaff/2012/nov/141601.htm>

Commercial Manure Applicator Training Scheduled for Jan. 4, 2013

<http://www.extension.iastate.edu/article/commercial-manure-applicator-training-scheduled-jan-4-2013>

Commercial Manure Applicator Training Scheduled for --County

<http://www.extension.iastate.edu/news/forstaff/2012/nov/141602.htm>

Extension Offers Dry Manure Applicator Certification Workshops

<http://www.extension.iastate.edu/article/extension-offers-dry-manure-applicator-certification-workshops>