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July 29, 2014

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 14ESD-FSB-JPRIER-0015, between the Iowa Department of Natural Resources and Iowa State University Extension and Outreach, attached is a copy of the FY2014 Manure Applicator Certification final project report. The project report covers the period from July 1, 2013 to June 30, 2014. A copy of the final report will also be made available electronically at:
<http://www.agronext.iastate.edu/immag/mac.html>.

Also enclosed are 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. Daniel Andersen
Rachel Klein
Linda Wilson

Manure Applicator Certification Program
July 1, 2013 to June 30, 2014
Agreement Number 14ESD-FSB-JPRIER-0015
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 2008-2014 is presented in Table 1(a complete list of modules by year from 2001-2014 is available upon request).

Commercial Manure Applicator Program

Materials developed for the 2014 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 7, 2014. A list of modules by year, from 2008-2014 is presented in Table 1 (a complete list of modules by year from 2001-2014 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 2014 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	
2014	Introduction A. Rieck-Hinz- 6 min	Introduction, Fees, Forms A. Rieck-Hinz 9:30
	Rules. J. Prier 30 min	Land Application Rules J. Prier 40 min
	Foaming Pits D. Andersen 37 min	Foaming Pits. D. Andersen, 37 min
	PEDV and Biosecurity, B. Baker 30 min	PEDV and Biosecurity, B. Baker, 39 min
	Manure Spill Response. T. Steinhart 22 min	Manure Injection Issues, D. Andersen, 26 min
		Review of Custom Applicator Survey. A-Rieck-Hinz 30 minutes
	Dry Manure Applicator Program	
	Rules, Separation Distances, Recordkeeping Requirements, Signage, and Spill Reporting. A. Rieck-Hinz 50 min	
	Managing Beef Feedlot Manure. Russ Euken 40 min.	
	Solid Manure Sources and Management Practices of the Iowa Nutrient Reduction Strategy, A. Rieck-Hinz 40 min	
	2014 Stockpiling Regulations, A. Rieck-Hinz 30 min.	

Supporting Training Materials

New factsheets were developed to help commercial manure haulers and producers better protect their farms and help guide them with biosecurity protocols for PED Control. The two factsheets were: MAC 1 *Biosecure Manure Pumping Protocols for PED Control: Recommendations for Commercial Manure Haulers* and MAC 2 *Biosecure Manure Pumping Protocols for PED Control for Confinement Site Applicators*. The copies of existing DNR 113 *Separation Distances for Land Application of Manure*, and DNR 115 *Commercial Manure Applicator Certification*, and DNR 116 *Confinement Site Manure Applicator Certification* were also distributed at all workshops and video trainings. For the Confinement Site workshops, three additional factsheets were given: MAC 3 *Manure Spill Response Scenario*, MAC 4 *Expert Panel Ranking and Reasons*, and PM 1859 *Emergency Action Plans* were distributed.

Certification Workshops

Confinement Site Workshops

Training workshops for the 2014 Confinement Site Manure Applicator Certification program began in January 2014 and continued through February 2014. A total of 61 Confinement site manure applicator workshops were scheduled for 2014. A workshop was eventually canceled after being rescheduled twice due to weather. 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 1,498 confinement site applicators attended the certification workshops, while ISUEO has collected 1,223 confinement site application evaluations. The 2014 Confinement Site program was presented by 20 Field Specialists including: 5 Agricultural and Bio-systems Engineers, 5 Beef Specialists, 6 Swine Specialists, 3 Dairy Specialists, and 1 Campus Specialist.

There was also a confinement site certification workshop at the 2014 Iowa Pork Congress in which 14 people attended. A workshop was also conducted on February 26, at the National Animal Disease Center for staff working with animals and manure; seventeen people attended that workshop. The DNR requires staff at NADC meet certification requirements.

Commercial Applicator Workshops

The 2014 Commercial Manure Applicator program was delivered via coordinated showing on January 7, 2014. This showing was presented in 76 Iowa County Extension offices, one Minnesota County office, and two Wisconsin County offices. A total of 12 applicators attended in the Wisconsin County offices.

The ISU Extension and Outreach staff has reported 1,211 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 increased to 556. The number of currently certified Commercial manure applicator representatives has also increased. In 2013, there were a total of 2,102 certified commercial manure applicator representatives compared to 2,120 for this year (by the end of June). The number of certified confinement site applicators in 2013 was 2,212 and current (June 2014) there are 2,266 with approximately 478 applicators who will need training to keep their certification current.

Dry Manure Workshops for Commercial and Confinement Site Applicators

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

Date	Location	Attendance
February 5, 2014	Orange City	39
February 10, 2014	Thompson	25
February 12, 2014	Ellsworth	19
February 13, 2014	Nashua	16
February 17, 2014	Washington	6
February 20, 2014	Greenfield	21
February 21, 2014	Clarion	40
February 27, 2014	Storm Lake	24

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: rules, separation distances, recordkeeping requirements, signage, spill reporting, managing beef feedlot manure, solid manure sources and management practices of the Iowa Nutrient Reduction Strategy, and stockpiling requirements.

Certification Workshop Evaluation

2014 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, if any, adjustments do you make to your equipment as you switch fields or manure applications rates to make sure you achieve good injection of the manure?

Adjustments	Responses
Nothing	208
Adjust injector depth	587
Adjust travel speed	785
Adjust injector down pressure	573
Adjust gang angle on disk/coulter	256
Other	95
No Response	102

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

Injector choices impact the amount of residue left on the surface, the volume of manure that can be injected and the amount of power required (energy consumed to pull the injector.) Of these four, which would you rate as the most important? Rank from 1 – 4 with 1 being the most important to you and 4 being the least important to you.

Important injector choices	1 Rating	2 Rating	3 Rating	4 Rating	No Response	Total Response
Quality of injection site coverage	560	245	114	72	201	1,192
Residue cover remaining	246	368	241	135	202	1,192
Capacity of injector	135	234	358	258	207	1,192
Amount of power required/energy used	118	150	213	501	210	1,192

The following question was also asked about the Iowa's Nutrient Reduction Strategy

Have you heard about Iowa's Nutrient Reduction Strategy?	Yes	No
	325	867

2014 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 2014 Confinement site program:

How useful was the manure spill scenario to your farm?

	Not at all useful	Somewhat useful	Very useful	No Response	Total Response
How useful was the manure spill scenario in helping you think through the priorities of a manure spill situation?	34	440	733	16	1,223
How useful was this exercise in helping you determine the need to an emergency action plan?	35	447	720	21	1,223

Developing Emergency Action Plans

Questions relating to Emergency Action Plans:	Already developed	Plan to develop	Not applicable	I need more info	No response	Total response
I will be developing an emergency action plan for manure spill response.	585	487	88	8	55	1,223
I will be developing a bio-security plan for disease control.	689	335	130	11	58	1,223

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 2014 MAC advisory committee gathered on July 30, 2013, at the Iowa Turkey Federation Boardroom. Members in attendance included: Dan Andersen, Kapil Arora, Russ Euken, Dan Huyser, Rachel Klein, John Lawrence, Mark Licht, Tom Miller, Angie Rieck-Hinz, Shawn Shouse all ISU staff; Tyler Bettin, IPPA; Gretta Irwin, Iowa Turkey Federation; Brad Jochum and Rich Rausch, ICNAA; Jeff Prier, Karen Grimes, and Gene Tinker, IDNR. Introductions were done, the group toured the IMMAG website, and handouts were given to the committee members. The committee reviewed the 2013 program year, discussed program ideas, and training materials for the 2014 program year.

Promotional Materials

Promotional materials used in the 2014 Manure Applicator Certification programs were similar to that of previous years. Postcards were developed for the January 2014 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 applicators and confinement site applicators in December 2013.

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 2014 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/pastevents14.html>. A list of workshop dates was distributed to attendees at the Iowa Pork Congress in January 2014. An article was prepared and distributed through the November 2013 *Iowa Pork Producer Magazine* (p. 28) found at <http://www.iowapork.org/FileLibrary/States/IA/News/Magazine/Nov13Mag.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 16, 2013, January 27, 2014, April 28, 2014, and June 30, 2014.

Partnerships

For FY14 the normal partnerships with IDNR, members of ICNAA, ITF, IPPA, ICA, ISDA and IPA were maintained.

Future Needs

Fiscal year 2014 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, 2014, is provided via the ISU Office of Sponsored Programs.

Appendix 1. Press Releases

Confinement Site Manure Applicator Workshops Scheduled for 2014

<http://www.extension.iastate.edu/article/2014-confinement-site-manure-applicator-workshops-scheduled>

2014 Confinement Site Manure Applicator Training Scheduled in -- County

<http://www.extension.iastate.edu/news/forstaff/2013/nov/111601.htm>

Commercial Manure Applicator Training Scheduled for Jan. 7, 2014

<http://www.extension.iastate.edu/article/commercial-manure-applicator-training-scheduled-jan-7-2014>

Commercial Manure Applicator Training Scheduled for --County

<http://www.extension.iastate.edu/news/forstaff/2013/nov/111602.htm>

Extension Offers Dry Manure Applicator Certification Workshops

<http://www.extension.iastate.edu/news/forstaff/2014/jan/091601.htm>

2014 Dry Manure Applicator Certification Workshops Offered by Extension

<http://www.extension.iastate.edu/node/21508>