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A. Training and Certification for livestock facilities and manure management

1. In general, what are the motivations and objectives of trainees? Except of Certified Livestock Manager (CLM) training that is required by the Livestock Management Facilities Act (LMFA), do the other trainees participate the training voluntarily?

There are three types of trainees at CLM workshops: (1) producers or farm workers that must be certified once each 3 years. All livestock farms with more than 300 animal units must have at least one person that works on the farm certified; (2) technical service providers, such as engineering firms, who must know the rules and help farmers prepare nutrient (manure) management plans; (3) other parties including government engineers for USDA NRCS, farm managers from University research farms, and an assortment of others including environmentalists, animal welfare organization members, the press and so forth.

Majority
Farmer

Motivations for the trainees are variable, from a regulatory requirement for farm personnel, to a desire to maintain professional competence on the part of technical service providers, and as a matter of curiosity or job requirement for others.

We do see voluntary participation, especially among smaller producers that might not need to be certified but elect to attend. The vast majority, however, attend because they must.

2. How does University of Illinois Extension decide the frequency of courses? What are they?

The courses are taught annually. They are held all over the state, focused on areas with more intensive livestock production. There are generally between 8 and 12 workshops per year. In addition, for the past few years we have offered an online training module.

3. How does University of Illinois Extension arrange lecturers, the course content and the progress?

The workshop content is focused on the fundamentals of utilizing manure as a crop nutrient resource, without over-application. This core content involves about 1h 45m of the 4h course. Other topics included are a module on safety and health, a section on best management practices such as the basic philosophy of nutrient management planning, new rules, and air quality issues; a lecture on recent changes that affect producers, formatted so that it provides flexibility to update attendees on new information (e.g. our new Illinois Environmental Protection Agency (IEPA) CAFO rule, or the new Illinois Nutrient Loss Reduction Strategy) as it changes, and a specific lecture on key rules in the LFMA that must be known (e.g. set back distances, types of permits needed, methods for new construction). After the workshop, those attendees representing farms with over 1000 AU must take and pass a written exam.

Over the years, we have experimented with providing some guest lecturers. This is best done with the Safety, the Best Management Practices, and the Recent Changes components. Some years we do not invite anyone, or we have someone for only a few workshops.

The online modules generally follow the workshop outlines, and there is a quiz at the end of each module. Once these are passed, a certificate is issued, and the person is eligible to take the exam with the Department of Agriculture.

4. How does University of Illinois Extension evaluate the performance of livestock manure resourcelization? What are the verification mechanism and regulations?

This is an interesting question to ask. The focus is mostly on proper resource utilization, but there is not any formal evaluation process. Extension does not conduct any evaluation of manure utilization, nor of regulatory compliance. Instead, we act as independent information specialists to help producers to understand the rules, and to facilitate the Illinois Department of Agriculture (IDOA) in maintaining the integrity of the CLM program and thus supporting the LMFA. The IDOA does have regulatory power over aspects of livestock operations. Also, since 2014, the IEPA has implemented new, mostly parallel rules because of pressure by the US EPA. These two state agencies do have mechanisms for regulatory compliance and enforcement; the IDOA is mostly on new construction or expansion of existing operations; the IEPA is focused on the prevention of discharges of manure into the waters of the state. The IEPA does have inspectors who make regular visits and investigations of complaints.

5. Knowing that University of Illinois Extension had given many different courses for years, and some of the courses are not given in 2017 anymore, e.g. Swine Manure Management Short Course. Therefore, we wonder that how University of Illinois Extension decide the topic and content of course. Are there any trends and long term planning?

Special workshops and short courses are provided when an issue seems to need to be addressed and we have resources to provide. For example, this year we are hosting some mortality composting field days in which we show producers the proper steps involved for successfully composting their mortalities. Other years, at the request of an agency or an outside group, we will assemble information for them if schedules and funding permit. We also regularly partner with other Extension educators to provide support for their programs.

6. After finishing Certified Livestock Manager training, do trainees need to retrain in three years?

Generally, yes. The certification is good for 3-years, and it is the individual, not the farm, that is certified. Thus, if the person were to leave a farm, then someone else on the farm must become certified.

7. For the people who don't attend the training in accordance with the law, does Illinois State has a disciplinary mechanism for this?

In fact, this is not a big issue. Most producers know they must be certified and see it as a measure of protection against frivolous complaints. However, if a farm has a discharge and the IDOA is involved in the investigation and learns that there is no one on the operation that is certified, there will be some strong encouragement to address this.

B. Building and management of Manure Share Platform

1. How does University of Illinois Extension build up manure hare system? Is Manure Share Platform **commissioned** by State government, Swine Association or the other institutions? What are the operation and management mechanism of it? *20-25 yrs ago.*

The manure share program was initiated many years ago when the new "online" web technology spawned many such offerings for forages, hay, animals, etc. The existing program is a simple legacy application that runs on the University of Illinois Extension servers. It is not supported by any agency and is no longer maintained by the Agricultural Engineering Extension team. It is operated in a very "hands off" manner, and people can barter or buy/sell manure by posting their information. Producers with manure can have their names added to the system, but it has become difficult to get

the technical support from Extension to even do this simple task. About two years ago I attempted to remove the program, and there was a vocal outcry against it – thus some people are apparently still using it.

2. Are there any restrictions on transport distance, quantity and quality of digestate or manure, and the area of farm land? For instance, the transport distance should not exceed specific kilometers, and the applied manure should not exceed specific tons per day.

The only restriction is with respect to applying the right quantify of manure to the right amount of land, which is the basis of nutrient management planning. There are no restrictions about this in the manure share program, however. Instead, there are some links to various regulatory pages, also many of which are perhaps outdated.

3. When did University of Illinois Extension build up Manure Share Platform? For now, what is the performance of it? For example, how many tons of manure and digestate and area of farmland that Manure Share Platform had assembled to apply.

Many years before I came to work at the University! There are no statistics gathered regarding its impact, other than an annual report on website visits.

4. How does University of Illinois Extension manage Manure Share Platform? What are the obstacles and the solutions?

As noted above in answer to question B1, we have minimal management with it. The key obstacle is a lack of resources and will to maintain and improve it. The lack of will is mostly related to my opinion that it is not very useful to larger commercial operations; they generally either apply to their own fields or make arrangements with neighbors, because transportation costs can become excessive.

C. Examination of livestock manure and digestate & soil and groundwater test

1. Does University of Illinois Extension or research team help livestock farm examine the digestate and manure? What are the examined regular items and average data of manure and digestate from swine, cattle and dairy cow?

We do teach producers how to read the laboratory analyses of their manure samples as part of the CLM workshops. Sometimes we host workshops, such as this year, where we show how to obtain proper samples. We do have some interesting information on trends of swine and dairy manure composition from other states that show some changes in Nitrogen and Phosphorous concentrations over the past decade or so.

Incidentally, there is little or no digestate that I'm aware of in Illinois – biodigesters are generally cost-prohibitive in our economy.

2. Does University of Illinois Extension or research team do soil and groundwater test for farmers? Does State government rule the frequency and items for the test?

Producers obtain manure samples and send them to commercial labs for analysis. University Extension does not provide laboratory analysis of manure anymore. Some water samples may be analyzed by the State Water Survey located within the University of Illinois. Producers with

perimeter tile around buildings and field tile in some instances must obtain water samples from the tile and have them analyzed.

3. In the case of applying manure and digestate in the soil, in the long term, whether there is the heavy metal accumulation problem or quality problem.

I am unaware of this as any significant issue for livestock production. Of course, we do worry about it when applying municipal sludge to fields. We can get an estimate of any accumulation by looking at manure analyses, but I have not seen evidence of heavy metal accumulation. We are asked this often on technical visits to China also. We think that if there is heavy metal accumulation in soils, either it is residual from some other industrial activity or else there is a significant problem with the long term quality of livestock feed.

4. In the case of long-term applying manure and digestate, in the long term, whether there are trends of groundwater conductivity, ammonia nitrogen or quality.

There is a substantial concern by society to reduce nitrogen and phosphorus losses from agriculture, and a recognition that the vast majority of these losses are from commercial crop producers utilizing chemical fertilizers. However, this is not so much a problem related to the long-term application as it is to OVER-application for the soil properties and crop characteristics. Also, the timing of chemical or manure nitrogen as a fertilizer application is important; if the soil is too warm in fall, substantial quantities of N can be a loss as NH_3 to air, as NO_3 to water. But it is recognized that it is an economic loss, as well as an environmental burden. A new initiative by all states connected to the Mississippi River termed a "Nutrient Loss Reduction Strategy" has been implemented recently. It seeks to reduce both N and P losses to watersheds that drain into the Mississippi River and includes potential pollution sources such as cities, municipal sewage treatment discharge, etc. For agriculture, strategies include focused techniques to further reduce soil erosion for phosphorus control, and refinement in N application timing and use of cover crops for N retention.