

## Identification of the Sick or Compromised Pig

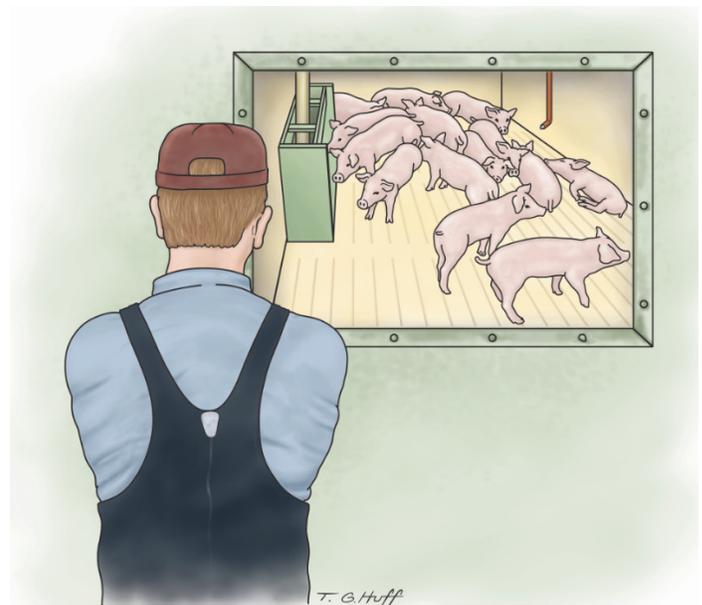
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Identification of compromised pigs requires an awareness of the entire population and necessitates timely decisions in respect to treatment, transportation and/or euthanasia.

Daily observations of pigs by walking the pens will contribute to early identification of pigs in good and poor health. Initially, try to assess a group of pigs from a distance before disturbing them. This allows you to make an assessment of their behavior (**Figure 1.**) We suggest scanning the pens for down or lame animals, increased activity near the water or feeders and listening for coughing or sneezing. Observe the ventilation for faulty or mismanaged air quality such as pigs piling due to cold air drafts.

Next, enter the room or area quietly and observe the pigs individually and using a system we call **B.E.S.T. System**. This acronym stands for **Body; Eyes/ Ears/Nose; Skin/Haircoat; Temperament**. In a con-



**Figure 1. Observing a population of pigs without disruption.**

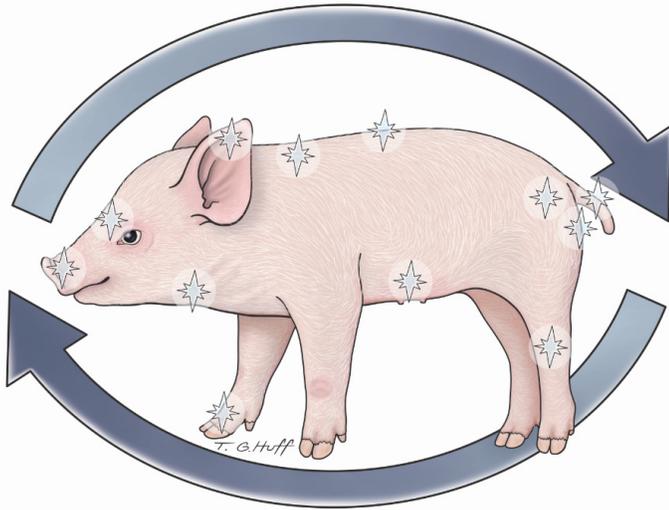
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sistent and systematic routine, observe each pig, in a clockwise direction, from snout to tail (over the back) and then tail to snout (across and under the belly). (Figure 2.)



**Figure 2. Observation of an individual pig - B.E.S.T system.**

The **Body** should be sound and well muscled. The spine, hips and ribs should not be visible in nursery or finishing pigs. Prominent spines are an indication of malnutrition (inadequate food access or intake) or malabsorption (inadequate absorption of feed consumed). The tail is without lesions and/or bites and the area around the anus and vulva (females) should be clear without evidence of diarrhea. The feet and legs appear similar, without swelling or lesions or cracks on the toes, and the pig should be able to walk without signs of lameness. The belly of the healthy pig appears full. Clinical signs of panting, thumping/labored breathing, coughing, wheezing or sneezing are not indications of a normal and healthy pig. Shaking, prostrate and paddling or lack of balance are also abnormal behaviors.

**Eyes, ears and nose** should be pink and free from lesions or secretions. Dull, sunken or irritated eyes may indicate a sick pig. Cloudy or dark discharge around the eye is commonly seen in cases of respiratory disease. The pig's normal ears are generally clean and free from accumulations, swelling, parasites or injury. The nose should be cool and moist, devoid of lesions and without deviation to the right or left.

**Skin and Hair** should be smooth, clean, and uniform in density. Lumps, bumps, sores, scaly or loss of skin or hair, or crustiness may be from parasites, infection, fighting or nutritional deficiency. Ulceration on the skin may indicate belly nosing and scales or crusting might indicate mange. Geometric or exudative lesions are generally caused by bacteria.

**Temperament**, pigs by nature are naturally inquisitive and are should be responsive to their environment with natural curiosity<sup>1</sup>. When approached, pigs might move away initially but will return and investigate, snuffing and biting at boots and clothing. Sick pigs may be observed purposefully avoiding you and away from the group, with their head and ears down.

In summary, responsible pig care requires that the compromised animal(s) are identified and that the stockperson act quickly to treat, cull or euthanize the compromised pig. The first step in identification of a sick pig is in taking the time to observe all the pigs in a pen or area as a population followed by individual pig observations systematically in a clockwise direction. Using the **B.E.S.T.** system the stockperson will remember to observe all aspects of the pig.

#### **References:**

1. *Animals Make Us Human: Creating the Best Life for Animals* by Dr. Temple Grandin and Catherine Johnson

# Group Sow Housing – Decisions to Consider

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## Introduction

Pork producers in multiple states, including Michigan have legislative or regulatory mandates to house gestating sows such that they can turn around freely without impediment, lie down, stand up and fully extend their limbs. The implementation of this mandate will cause producers to house sows in groups during gestation. The change from housing sows in stalls to group housing is not just simply changing the penning. There are critical sow care and welfare, productivity and financial considerations to evaluate. Pork producers that make this change must evaluate how their animal management and employee training program will change, what productivity differences may occur and how the initial capital costs as well as any changes in cost of production will ultimately affect their farm business. This article will address some of the decisions pork producers face when considering the change from individual stalls to housing sows in groups.

## Issues to Consider

Farms that change from housing gestating sows in individual stalls to housing them in groups have important, complex decisions to make. For the most part they can be categorized by the following:

- What are the financial resources for the project?
- What type of feeding/housing system will be used?
- Will the present building shell be used or will additional space or a new barn be built?
- Will the present feeding system be maintained?
- What is the design specification for floor space

allocation per sow?

- What is the design specification for the number of sows per pen?
- How will animal management and employee training change?
- Will productivity change and if so, how will this affect subsequent cost of production and long-term profitability and viability?

Under each of these categories are many subcategories that will also have to be addressed. However, these points can provide the framework of putting together a transition plan from individual stalls to group sow housing.

This article will begin to address the first two items in the previous considerations. It must be understood however, that many of these topics are interlinked and as changes occur within one category, other changes must occur across these decision points. Subsequent Pork Quarterly articles will address other areas that must be considered when making the transition from stalls to group sow housing for gestating sows.

## Financial Resources

Farms that consider this transition must be realistic in what the initial capital costs will be and productivity changes that may occur which could alter cash flow. As with any project of this type it is realistic to assume that there will be a period of time where cash expenditures will increase and earnings may be reduced. Farms that are in good equity positions should be able to work with their lender and develop a reasonable transition plan that would include cash

flow assistance over the time period of remodeling/ construction when expenditures could increase as well as some type of sensitivity analysis that would show how earnings could fall. This will help the lender understand how operating loans may need to change while the farm works through this transition. Farms that are highly leveraged should evaluate their present financial position and determine what type of transition plan they can afford without worsening their position to a point of insolvency. This will be more challenging. There are tools available from the National Pork Board and Michigan State University that can assist in comparing the cost of transition of different housing systems. However, farms will need to have accurate and reliable quotes from companies that will provide the new equipment and complete the installation.

### **Feeding/Housing Systems**

As pork producers consider what type of feeding and housing system to implement, many of the subsequent choices fall into place. This is a critical decision since once the type of system is chosen and installed; it can be difficult to change quickly. Several important topics should be reviewed when considering the available options;

- Does the farm want sows to consume feed in a competitive or non-competitive system?
- How much control does the farm want over the amount of feed offered to sows during gestation?
- Can the system maintain a high level of sow care and welfare?
- Will the system require more or specialized labor?
- What is the management capacity of the farm staff to learn and manage the different systems of choice?

### *Non-competitive vs Competitive Feeding Systems*

Feeding/Housing Systems can be classified in multiple ways but typically they are classified as either

Non-competitive or Competitive Feeding Systems. The big difference between the two is that in Non-Competitive Feeding Systems, sows can eat their daily feed allocation without interference from other sows, while in Competitive Feeding Systems sows can interfere with each other while feeding. There are two primary non-competitive feeding systems, Electronic Sow Feeding and Free Access Stalls. There are many versions of competitive feeding systems and typically they are classified as floor feeding, non-gated feeding stalls, or trickle feeding.

### *Electronic Sow Feeding (ESF)*

ESF (**Figure 1a., below**) is considered a “big-pen” system with group size ranging from a low of 30-40 sows to high of 200 or more sows per pen group. Each ESF station can typically feed 50-80 sows and group size is typically a function of how many ESF stations will be placed into a pen. ESF allows management to specify the exact amount of feed to be offered to each sow per day. In addition, each day the ESF system will provide a report listing sows that did not eat their previous daily allocation. This can be an indication that a sow may be ill, injured or has lost her Radio Frequency Identification tag which indicates to the station which sow she is.



**Figure 1a. An example of sows housed in an ESF**

The ESF system can also be fitted with features that will mark a sow with a spray livestock marker for particular reasons (e.g. vaccination, pregnancy evaluation, etc) as well as to sort sows out of the pen when finished eating (e.g. pregnancy evaluation, move to farrowing, etc). The ESF system provides the greatest control for feed allocation on a per sow basis. However, it is also felt that ESF requires a higher skill set to manage properly. This is due to a need for improved stockmanship and the ability to manage the feed station and repair it as needed. Often, support for station repair and maintenance can be supplied by the manufacturer through a service contract.

Typically a few small pens are maintained throughout the barn for compromised sows that may be lame, sick etc. It is not uncommon that compromised sow pens will make up 5%, and sometimes more, of the total gestation space. Though the individual feed station is considered costly, often the cost per sow (including all penning, floor space, etc) is comparable to other group housing systems. Static or Dynamic Grouping can be used. In both cases standard operating procedures on putting sows together in pens should be developed to minimize fighting, injuries, lameness and culling.

#### Free Access Stalls (FAS)

FAS (**Figure 1b., below**) are typically considered to be a medium to large group system with the num-



**Figure 1b.** An example of sows housed in FAS

ber of sows in a pen often dependent on how many different feed amounts are to be offered to gestating sows. FAS is a non-competitive feeding system that allows the sow to walk into an individual stall and the gate close and lock behind her. When she wishes to leave, she can back up and the gate will open allowing her to back out into the common space. Typically the alley between the rows of stalls can range from 6-10 feet, but often it is 8 feet. The layout can vary. Typically there is a loafing area offset from between the stalls but it is not unusual that the only common area is the aisle between the stalls. All sows within a pen are fed the same amount of feed since no one sow will always eat in the same stall. Therefore if farms wish to have the flexibility to segregate sows by the amount of feed to be offered to each sow, allowing more feed to thin sows and less to heavier conditioned sows, sows will have to be sorted into pens dependent on the amount of feed offered. It is not unusual for compromised sows to be “locked in” and not allowed out while being treated or recovering from an injury, as long as water is available within the stall. If water is not available within the stall, designated stalls within a pen may have water provided to be used for compromised sows, or a designated compromised sow pens should be available elsewhere in the barn. Static or Dynamic Grouping can be used. In both cases standard operating procedures on putting sows together in pens should be developed to minimize fighting, injuries, lameness and culling. FAS are more expensive than a typical gestation stall due to the extra mechanical devices to allow for the self-closing and opening gate. This along with more space needed on a per sow basis, typically makes this system a higher cost option.

#### Floor Feeding

Floor feeding sows (**Figure 2a., top of following page**) in groups is just that, dropping feed on a solid portion of the floor and sows mill about consuming feed. This type of feeding and housing system is of-



**Figure 2a. An example of sows housed in a Floor Feeding System**

ten used when sows are penned in small groups, typically no more than 20 sows per pen. The solid portion of the floor that feed is dropped onto can vary. It can be a solid portion of the floor level with the slatted floor. It can also be a raised pad within the pen, along with other variations. The total amount of feed dropped is typically equal to the amount of feed that should be fed to any sow within the pen, multiplied by the number of sows in the pen. For example if you believed that sows within a pen should be fed 5 lbs. of feed per sow per day and there are 5 sows in the pen, then 25 lbs. of feed per day will be dropped to feed the sows. It is recommended that when floor feeding sows, sows should be penned in static groups. Floor feeding is typically considered an inexpensive system to install. However, feed wastage is a concern as well as increased levels of aggression due to fighting for feed which can lead to increased injuries, lameness and culling.

#### Non-gated Feeding Stalls

Non-gated Feeding stalls (**Figure 2b., right**), sometimes called “short stalls” are a hybrid version of typical gestation stalls. The stall is typically 18-36 inches in length and separates feeding areas where feed drops are located, similar to what would be seen in

a typical gestation stall barn. The feed is housed in a feed box and dropped onto a solid area under the feed tube or into a feed trough. All the sows within a pen are offered the same amount of feed, since sows will not typically go to the same feeding location each time feed is dropped. This type of feeding and housing system is often used when sows are penned in small groups, typically no more than 20 sows per pen. Sows should be penned in static groups. The cost of installation can be somewhat less than what a producer would expect when installing typical gestation stalls.

#### Trickle Feeding

Trickle Feeding (**Figure 2b.**), sometimes called Biofixation Feeding, has similar penning and looks similar to Non-gated Feeding stalls. The major difference is in how feed is delivered. Special feed motors are used to deliver feed at a very slow rate so that the quantity of feed dropped is close to what a sow would eat in one bite. The idea is that if you “dribble” the feed the sow stays “fixed” in place



**Figure 2b. An example of sows housed in a Non-gated Feeding stall system. Trickle feeding systems will look similar to Non-gated feeding stalls, except for the feed motors and feed delivery lines.**

as the feed drops from the feed tube. This usually takes 15- 30 minutes. Similar to non-gated feeding stalls, this is considered a small pen option and sows should be penned in static groups. Typically there is more equipment needed to install this option, compared to non-gated feeding stalls which make it more expensive.

### Further Information

Subsequent Pork Quarterly Articles will discuss other important issues when considering changing

from individual stalls to group sow housing. Pork producers wanting further information on sow housing can find multiple factsheets discussing the topic at the National Pork Board site <http://www.pork.org/Resources/3703/SowHousingOptions.aspx>. There will also be a breakout session on changing gestating sow housing at the Michigan Professional Pork Producers Symposium. See page 4 of this issue of *MI Pork* for more information on the symposium.

## Will attended farrowings help increase your bottom-line?

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In the world of pork production we all know that in order to make a profit there are numerous variables to consider. The price of inputs and market pig value, both of which are influenced by many factors, indicate if your bottom-line is a profit or loss. One thing that we also know is that if we don't have a product to start with, we won't have anything to sell regardless of input costs or market value. This is where farrowing room protocols and stock people come into play.

Proper training of employees, understanding of pig health and viability and having effective protocols in place are a few variables that when done correctly positively influence production numbers. One protocol that can be considered by farm management is the ability to have attended farrowings at your operation. However, this protocol doesn't come without a price tag. In order to have attended farrowings you will need to either implement an induction protocol, increasing your animal health costs or increase the number of hours employees are on site, upping your labor costs. Both of these options are ones to consider for your farm, if you indeed see a benefit to

attended farrowings.

In order to help producers weigh the options for attended farrowing, different research projects have taken place to help determine the effect of attended farrowings on number born alive and increased colostrum intake which can lead to increased immunity resulting in healthier piglets.

### Research Trial Number 1 – Materials/Methods and Results

In a study reported by Nguyen et al., (2011) 159 multi-parity sows were involved in a trial to evaluate the benefits of attended farrowings. Sows were split into two groups of 75 and 84, respectively. The protocol for the sows in Group 1 required the sows to be induced on day 114. These sows had their farrowing supervised as needed during working hours. Group 2 sows farrowed naturally and only supervised twice a day during feeding and if assistance was needed at that time, it was given. For Group 1, 75% of the sows farrowed during working hours and only 4 sows in the group did not complete the farrowing process by the end of the



work day at 5 pm.

Results from this field trial included a measurable difference in the number of stillborn piglets between groups. For Group 1, 27% of the sows had a stillborn in their litter while for Group 2 49% of the sows had a stillborn in their litter. This indicates that the risk of stillborn piglets increases by 2.8 when farrowings are not scheduled during work hours so that they can be attended by stockpersons. Although the results from this study are favorable for attended or scheduled farrowings it was also found that when the piglets were followed through weaning there was no effect, either increase or decrease, on pre-wean mortality for either of these groups. Management protocols after day one were not considered and can influence pre-wean mortality.

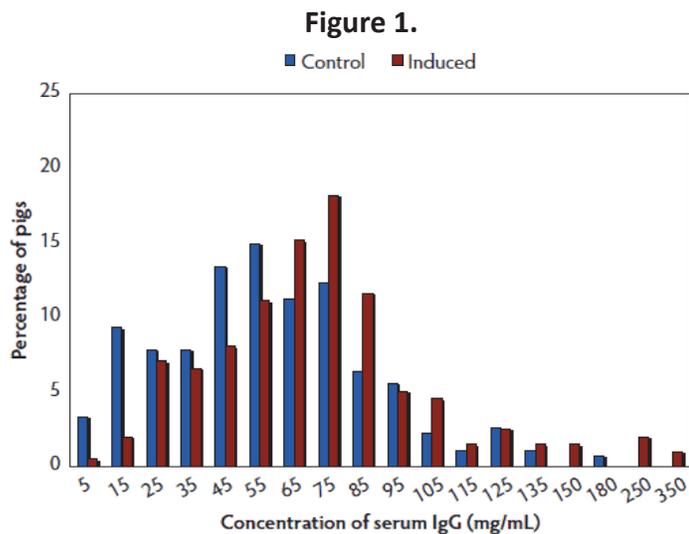
Further work by Smith et al., (2013) found that more sows experience stillborn piglets when induction occurred on day 116 verses induction on day 113. This research showed that when inducing far-

rowing, it is beneficial to give the treatment the day before the average gestation length for the operation. For example, if the farm's average gestation length is 114 days, induction should occur on day 113 so that the number of sows farrowing during work hours is maximized.

#### **Research Trial Number 2 – Materials/Methods and Results**

The project reported by Nguyen et al., (2011) laid the ground work for further studies by Nguyen et al., (2013). At a 600 sow farrow to feeder operation a research trial was done to determine if induced farrowings resulted in increased colostrum intake for piglets, that should improve piglet immunity levels. This was measured by blood samples taken to verify the serum concentration levels of immunoglobulin G (IgG).

Sows were split into two treatment groups. For Group 1, 56 sows were induced at 8 am and 2 pm on day 114. Group 2 was made up of 84 sows that



were allowed to naturally farrow. The first treatment group received enhanced day one pig care including; drying and warming of piglets as well as ensuring that each piglet received colostrum, as these practices would be a benefit of attended farrowings. Group 2, which served as a control group, were observed twice daily at feeding time, where assistance was given if needed and no additional care was given to piglets. Blood samples were taken from pigs on day 3 of age to determine serum levels of IgG. It was found that levels of IgG did indeed differ between the control and induced sow treatment groups. In the induced group, Group 1, 59% of the piglets had high levels of IgG, whereas 37% of the piglets from the control or Group 2 had high levels of IgG.

As illustrated in Figure 1, serum concentration levels of IgG differed among piglets in the trial, with piglets from the induced sow that had higher levels of IgG. This indicates that serum IgG levels do increase when piglets have improved colostrum intake during supervised farrowings with sows induced to farrow. It was also found that heavier pigs, as well as piglets from litters with a small number, also had higher levels of IgG. This trial indicated that birth order of piglets and sow parity had no effect on colostrum intake.

## Conclusion

It can be concluded that attended farrowings benefit production numbers either by increasing the number of piglets born alive or allowing for improved colostrum intake by piglets, resulting in improved immunity. This practice allows stockpersons the ability to work with as many piglets as possible and to give them the best care, resulting in better responses to health challenges due to proper colostrum intake.

Although having a stockperson available when farrowing is underway can be considered a best practice, consideration should be given to the extra cost associated with this practice. Increased animal health or labor costs can impact an operation's bottom-line as much as an additional pig per sow per year. A complete evaluation of associated costs should be done when considering implementation of a supervised farrowing program.

Other items that should be considered are the management practices employed through the lactation period. Such practices can have strong influences on pre-wean mortality and health of the piglet. It is important to remember that various factors and stockmanship areas affect the productivity of an operation. Proper training and review of protocols can help assist with evaluation of a farm's productivity.

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- Nguyen K, Cassar G, Friendship RM, et al. An investigation of the impacts of induced parturition, birth weight, birth order, litter size, and sow parity on piglet serum concentrations of immunoglobulin G. *J Swine Health Prod.* 2013;21(3):139-143.
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# Reducing the Risks Associated with Winter Manure Application

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Anytime plant nutrients, both commercial fertilizer and manure, are broadcast onto farm fields, lawns or recreational turf there is a degree of inherent risk of a small percentage being captured in precipitation runoff and eventually ending up in a nearby ditch, stream or other surface water. It is the responsibility of home owners, turf grass managers and farmers to follow best management practices (BMPs) developed to limit runoff and keep plant nutrients out of surface water and in the rootzone for crop uptake.

With frozen soil and the potential for snow build up followed by a spring thaw, winter spreading of manure, or any other crop amendment, carries with it a greater degree of risk and potential for runoff into surface waters. As a result of this increased risk with winter spreading, many within both agriculture and environmental groups have begun to question the practice. Others continue to research methods of reducing the risk associated with winter spreading and maintain that manure application option.

Listed below are some of the risk factors one should consider when selecting fields for winter manure application.

**Residue cover:** Residue cover has three main functions. First residue helps hold things in place, including soil particles and manure nutrients. Second, residue will slow runoff down reducing the amount of soil and manure the runoff picks up. Finally, residue will act as a filter by capturing manure and soil particles suspended in runoff before they reach surface water. The Michigan Right to Farm Generally Accepted Agriculture Management Practices for Manure Management and Utilization (Manure GAAMPs) recommend conservation practices including vegetative buffers between surface waters and fields used

for winter manure applications. It is preferable if the entire field has some type of residue cover, including undisturbed corn stalks, wheat stubble or established hay.

**Field slope:** Naturally slope increases manure application risk. The Manure GAAMPs state liquid manure should not be winter applied to fields with greater than 3% slope and solid manure should not be winter spread on fields with greater than 6% slope. Manure should not be allowed to runoff on adjoining property owners. Avoid areas that slope towards and pond in neighboring fields no matter what the slope.

**Setbacks:** According to the GAAMPs manure should not be applied within 150 feet of any surface water unless incorporated within 48 hours of application, which is not practical on frozen, snow covered fields. Catch basins, grass waterways and any area water collects and flows toward surface water are also high risk areas. Maintain the 150 foot setback from those areas as well. Preferably the setback should be growing established vegetation or covered with undisturbed crop residue.

**Weather forecast:** Research has shown that nutrient loss increases if manure is winter applied 5 to 7 days prior to a runoff event. Monitor weather forecasts and avoid manure applications if a warm up in temperature or rain is predicted for the immediate future. Nutrient losses are reduced by a larger window of time between the application of manure to snow covered, frozen fields and a snow melt, winter runoff event.

**Timing of manure application:** Apply manure early in the winter. Avoid spreading in late February early March when there are greater odds of a large sudden snowmelt and/or rainfall event. Or, if manure must be spread throughout the winter choose fields with a higher degree of risk early in the winter saving low risk fields for later in the winter and early spring.

**Application rate:** Follow the normal farm manure application rates based on the nutrients in the manure and the needs of the crop to be grown. Do not exceed the N needs of the crop to be grown.

Reducing the environmental risks associated with winter manure spreading requires planning. There are resources available to help livestock farmers evaluate, on a field by field basis, the risk of winter spreading.

The Michigan Right to Farm Manure GAAMPs referenced above outline specific practices for winter application of manure in Michigan.

The Manure Application Risk Index (MARI) ranks the environmental risk of winter manure applications to fields, rating each field from a “Very low” to “High” risk. According to the MARI guidelines, fields rated as “Very low” and “Low” have a reasonably good potential for winter spreading. The Michigan Department of Agriculture and Rural Development and the Michigan Department of Environmental Quality recognize MARI as the appropriate tool for determining a field’s suitability for winter manure application. In Michigan, county NRCS Conservation Technicians and Michigan Agriculture Environmental Assurance Program technicians are available to assist farmers with the MARI tool.

The Livestock and Poultry Environmental Learning Center (LPE) is an online resource dedicated to helping livestock and poultry farmers identify and reduce environmental risk. One of LPE’s resources is a section dedicated to helping farmers identify and reduce the risks associated with winter manure application. This section on winter manure applications is avail-

able at: <http://bit.ly/winterspreading>

There are legitimate reasons for winter manure application. From delayed field work in the fall resulting in farmers needing to empty manure storages in the winter, to farms with bedded housing dependent on daily hauling, there will be times when manure must be applied in winter months. Livestock farmers need to recognize the associated environmental risks with winter spreading. Individually evaluating each field and utilizing the practices listed above helps reduce those risks.

**Mark your calendars!**

**MSUE Winter Meetings**

January 15th in Allegan

January 16th in Coldwater

January 29th in Cassopolis

January 30th in Mt. Pleasant

**Green and White Swine Show**

January 24th - 25th

**2014 Michigan Pork Producers**

**Symposium**

February 20th

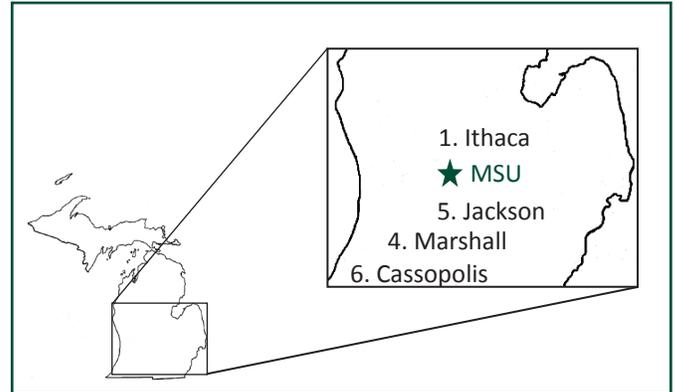
**2014 MPPA State-wide**

**Informational Meetings**

Last week in March

All comments and suggestions should be directed to:

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