

Manitoba Swine UPDATE

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Straw Based Systems for Finisher Pigs

At the 2004 "Hoop Barns and Bedded Systems for Livestock Production" international conference held in Iowa, performance of pigs in straw based systems was examined with discussions on ways to improve or enhance current production methods. Reviews of the advantages of these systems showed reduced capital costs compared to conventional buildings and easier handling because of automatic sorters. Pig performance was equal to that of conventional barns.

In Manitoba the capital costs for establishing a straw based hoop shelter finishing operation are about \$95 per pig place, making this an affordable option for producers. Operating costs are about the same as a conventional barn. Straw based production systems have appealed to new and existing producers alike over the years. New producers report a two year learning curve is needed, with success depending on following established management formulas which manage the environment for the pig.

Straw systems have some things in common with conventional management approaches such as the need to avoid overstocking, provide adequate feeder space and closely monitor ventilation. In addition to the obvious differences between the two systems, there are the added challenges of straw and moisture management. Also, recognizing changes in the pig's behaviour in a hoop structure can effect the success of this housing system.

Straw management equipment and automatic sorters have reduced labour requirements and

increased returns. Automatic sorters consistently sort 95 per cent or higher into the core of a grid. Straw blowers or a track-equipped skid steer minimizes the labour and time required for this work.

Group size has grown to an average of 250 pigs per group but can be as high as 2500. Producers in Manitoba have indicated that the system's infrastructure is paid for within four years, bringing more benefits in cost of production. Environmentally, neither nitrogen nor phosphorous have been building in excessive amounts under these structures.

Producers continue to work with the straw based model for pigs other than grower-finisher pigs. One Manitoba farmer is working with group-housed nursery pigs on straw by bringing them in at 5 kg and raising them in groups of 150 to 200 pigs to 22 kg body weight. The pigs are finished in hoop barns to a market weight of 125 kg. Sows can also be group-housed on straw although there is little data available to evaluate this approach.

Studies are being done on ways to lower cost of production without giving up performance or scale in pig farms. Results to date are encouraging and work continues to capture data for nursery pigs and sows in large groups and their effect on cost of production and animal performance.

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GROWING Opportunities

Prepared by Manitoba Agriculture, Food and Rural Initiatives.

Manitoba 
Building for the Future

“You Get What You Pay For”

It is common to hear the phrase ‘you only get what you pay for’ when buying any product or service. However, while it’s obvious if you don’t pay anything you don’t get anything, the question is do you get more if you pay more? Not necessarily. On the other hand, a purchase opportunity that appears to be too good to be true may indeed be less than a real deal.

There are two commodities you should not buy on sale: parachutes and insurance. In either case you don’t want to experience an emergency to find out if it is dependable. You want to know that your insurance broker is experienced and your policy isn’t the only specialized “parachute” he/she put together recently.

You should choose an insurance broker who is experienced with the product being insured. The ultimate question could be “Have you ever had to settle a complete loss on the kind of policy we are looking at?” There is no learning curve more effective than having your broker’s work exposed to the scrutiny of an insurance claim. That’s the ultimate test and no amount of financial savings will make up for the error factor.

Insurance brokers should also be knowledgeable about current activities in the industry—what’s new, what’s happening behind the scenes in the insurance world and be able to provide information and advice. For example: “reinsurers in Canada are stabilizing rates - if not decreasing them outright

- and are easing up on the strict underwriting. The soft market is back!” - a quote from The Insurance Journal, August 2004. The article quotes Constanti Petalas, president of Axa Re Canada: “it is clear that the hard market will end this year.” Cameron MacDonald, president of Transatlantic Re and the Reinsurance Research Council stated further: “there is a lot of downward pressure on rates right now. I’m wondering how long reinsurers can resist.” Those are the comments from the people who regulate insurance costs in Canada, and that’s good news for the consumer.

Will we see reduced insurance costs in the near future? Yes, to some extent, only where warranted and only in 2005. Will we see easing on strict underwriting? No, especially in the hog industry. It’s an extremely volatile risk segment of insurance and the remaining street-front insurers have no choice but to manage the risk. They have to manage for continued reduced losses. The alternatives will mean on-going high rates.

I recommend talking to your insurance broker and reading the article “Loss Prevention = Insurance Cost Savings” in the Manitoba Swine Update summer issue 2004.

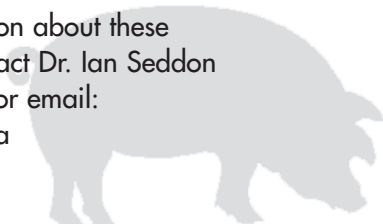
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Upcoming Events

Hog and Poultry Days will be held December 1-2, 2004 at the Winnipeg Convention Centre.

The **2005 Manitoba Swine Seminar** is scheduled to be held January 26-27, 2005 at the Best Western Victoria Inn in Winnipeg.

For more information about these events, please contact Dr. Ian Seddon at 204-945-0353 or email: iseddon@gov.mb.ca



Grain Aeration and Unheated Air Drying

A number of processes are used to dry or cool grain that involve passing it through unheated air. These include: aeration, unheated air drying, dryeration and in-storage cooling.

1. Aeration

Aeration is the use of relatively low airflow rates to cool grain and eliminate temperature and moisture differences in the storage bin. Aeration may be used with field dried grain or with grain that is harvested damp, then dried and cooled in a heated air dryer. This is used when temperature and moisture content variations exist in the grain or when the grain is too warm to store safely.

Temperature differences can cause moisture to move from warmer to colder areas of the bin. Significant moisture migration can occur in cereal grains at moisture contents as low as 12 per cent or oilseeds as low as 8 per cent if they are placed into storage at a high temperature and not cooled.

Larger storage bins and greater differences between grain and its surrounding temperature cause more moisture migration. The purpose of an aeration system is to produce the lowest practical temperature and the least temperature variation within the stored grain.

Successful operation of aerated grain storage is something that requires some background knowledge and judgement. The performance of any aeration system will vary depending on the bin depth and volume, grain type, fan characteristics, duct size and shape, and weather conditions.

With the exception of weather conditions, air flow rate will be the key factor. Your aeration system may move from 0.1 to 1.0 cfm/bus (1.3–13.0 L/s.m³). Lower air flow rates of 0.1 to 0.25 cfm/bus (1.3–3.3 L/s.m³) are quite adequate for cool grain coming from the field and for maintaining fairly uniform temperatures through the storage period. Higher air flow rates of 0.25 to 1.0 cfm/bus

(3.3–13.0 L/s.m³) will produce the same results faster and may also lower the moisture content.

Dry grain going into storage in the fall should be aerated for 10-30 hours (depending on the air flow rate) when the surrounding temperature is in the +5°C range. If the grain has been harvested on a warm day (20°C or more) it should be aerated for 6-24 hours (depending on the air flow rate) as soon as the outdoor air temperatures are around 10°C cooler than the grain temperature.

If the grain is tough or slightly damp, it should be aerated from the time it goes into storage until it is dry or cooled to +5°C. If the grain is dry before it is cooled completely, shut the fan off until the outdoor air is around 0°C. In checking the temperature and moisture content of the grain, be sure to check in the same place each time. Temperatures and moisture contents may vary from one location in the bin to another. Half the grain depth at the center and near the wall should be fairly representative. Be sure to sample at least one metre below the surface.

If the grain is damp and has to wait more than a day before being dried, it should be aerated until it is dried and again afterwards when the outdoor air temperature will allow the grain temperature to be taken down to +5°C.

Grain bins should be checked a week or two after aeration to ensure that grain temperature and moisture levels stay the same. Low, uniform temperatures are the primary objectives.

Once fall cooling is finished, aeration ducts or fans should be covered for the winter. This will keep the centre of the bin from being cooled excessively during the winter, which could cause moisture migration to the bottom of the bin the following spring.

During mid to late March the grain against the south wall begins to warm. Aeration fans should be operated for 6-20 hours when the air temperature is in the 0 to +5°C range. This evens the temperatures through the bin to prevent moisture migration.

If the grain is still tough, fan operation should begin with warm weather (10-15°C days) in mid to late April. Outdoor humidity levels at this time of year are often very low and drying may be comparatively rapid. Samples need to be taken frequently, from the same place each time, to monitor the drying rate. When the average moisture content is "dry" there may be still 2-5 per cent variability in the moisture. The grain should be turned to eliminate any high moisture pockets or layers.

If grain begins to heat it must be removed from the bin and dried.

2. Unheated Air Drying

Unheated air drying uses the drying potential of surrounding air to remove moisture from grain. Air is normally forced into the bin from the bottom through a fully perforated floor and exhausted through roof vents. Some of the moisture in the grain evaporates. The moisture transfer from the grain to the air takes place in the drying zone. The grain above the drying zone remains at or near its initial moisture content. Grain located below the drying zone has a moisture content which is the same as the incoming air.

When using the unheated air drying method, it is important to dry the grain before it spoils. This is achieved by moving the drying zone through the top of the grain mass within the allowable storage time. At a higher moisture content and temperature, the allowable time for drying is reduced. Wetter grain requires a higher airflow rate to accomplish drying within the allowable storage time. At higher temperatures, the grain deteriorates faster so higher airflow rates are required to complete drying before the grain spoils.

Air flow rates between 1/0 to 5.0 cfm/bus (13-65 L/s.m³) are required depending on the moisture content of the grain. Air flow rates this high require a high capacity, high pressure fan operating for many hours, and it may prove cheaper to run the grain through a heated air dryer.

Grain which is located at the top of the bin is likely to spoil first since it is the last to dry. When more air is delivered, the drying zone moves through the grain faster so the top layer is at risk for a shorter time. The fan should be operated continuously until the drying zone moves through the top of the grain or the temperature

drops low enough for safe storage. The bottom layer of grain over dries in dry weather and re-wets in damp weather. However, as re-wetting occurs at the bottom, the drying zone continues to move upward. The rate of rewetting is slower than the drying rate so a few days of fan operation in wet weather will not seriously affect the overall drying rate. Also, the grain is kept cool by the air moving through it, which increases the allowable safe storage time.

Fine material and broken grain increases airflow resistance, which reduces total airflow. Screening this material out will speed up the drying process. Since fine materials often accumulate in the center of the bin, unloading some grain from the center when the bin is full will make the airflow more uniform.

Keeping the grain level will also help to promote uniform airflow. Grain spreading devices can be used to distribute the grain, but some additional hand levelling may still be needed. The use of a grain spreader helps to distribute fine materials throughout the bin but it also packs the grain, which increases resistance to airflow and drying time. If a spreader is not used, some grain should be removed from the center of the bin after filling. This reduces the amount of grain to be moved while levelling and removes some of the fine material.

The fan should be started as soon as the grain covers the drying floor, and operated continuously until drying is completed or the grain temperature drops to 0°C. The fan should not be shut off during periods of rainy weather and high humidity in the fall. Continuous fan operation reduces the time for the drying front to move through the grain and helps reduce the rate of spoilage by keeping the temperature low. Even if some rewetting occurs at the bottom, this moisture will quickly be removed by operating the fan for a few days during fair weather conditions.

The use of supplemental heat will increase the drying rate but will also increase the likelihood of spoilage if insufficient airflow is used. When using supplementary heat, the rise in incoming air temperature should be limited to no more than 5°C to prevent spoilage. This is particularly critical for those systems with the lower air flow rates.

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