



FACT SHEET

Outdoor Piggery Fact Sheet Series
May 2012

PROMOTING MORE EVEN DISTRIBUTION OF MANURE NUTRIENTS IN ROTATIONAL OUTDOOR PIGGERIES

Australian and international research shows that manure nutrients are not distributed evenly across the paddocks of rotational outdoor piggeries. Rather, the nutrients are concentrated around the shelter; and in the area bounded by the shelter, the feeding facilities, the waterers and the wallow.

APL research has used electromagnetic (EM) induction survey technology, coupled with soil sampling and testing, to map the distribution of nutrients in rotational outdoor piggery paddocks. Figure 1 and Figure 2 below show the distribution of nitrate-nitrogen and Colwell phosphorus respectively across one of the surveyed paddocks in relation to the shed, wallow and feeding area.

Figure 1. Predicted Nitrate-N Distribution Map

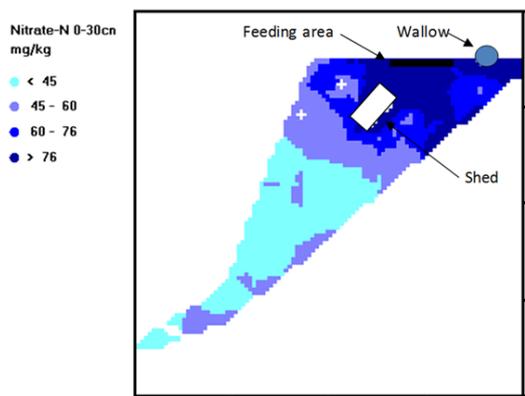
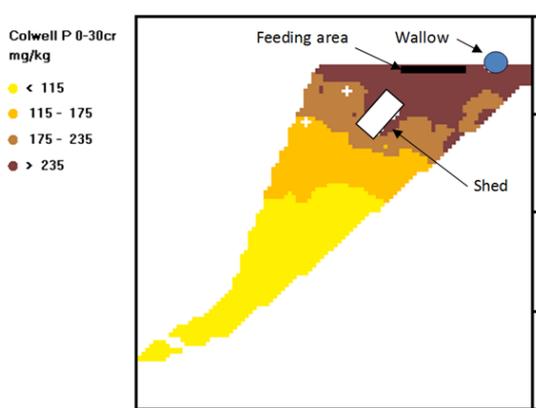


Figure 2. Predicted Colwell Phosphorus Distribution Map



Rotational outdoor piggeries will always accumulate nutrients in the soil because of the quantities of nutrients brought in as feed. If these nutrients are not evenly spread, soil nutrient concentrations in parts of the paddock may quickly reach levels that pose a risk to the environment. The potential for nitrate-nitrogen leaching from these hot-spots is of particular concern. There are also implications for crops grown on the land after the pig phase, in particular uneven crop growth and reduced nitrogen use efficiency.

To promote more even nutrient distribution across the paddock area it is necessary to change the excretory behaviour of the pigs. European researchers have identified that pigs mainly defecate and urinate as they move between the shelter and the feeding area, although they also excrete as they move between other installations. The researchers also demonstrated that regularly moving facilities around the paddock (e.g. every 3-4 weeks) was effective in modifying excretory patterns and in achieving more homogeneous nutrient distribution across the paddock (Quintern & Sundrum (2006) and Eriksen et al. (2006)). Using appropriate nutrient inputs will also help to reduce the ecological risks of nutrient accumulation and leaching.

Regularly relocating movable structures that could include shelters, shade, feeding points, waterers, wallows and spray or drip cooling facilities within the paddocks promotes more even manure deposition. It is recommended that this occur at least every six months for the breeding herd paddocks and at least every three months for grower paddocks. Position the shelters so that they are well separated from the feeding facilities. For piggeries that ground-feed, delivering the feed either right along the length of a paddock perimeter fence or dispersing it over a significant part of the paddock area encourage more heterogeneous spread of manure.

Other Fact Sheets in this Series

- Developing a Nutrient Management Plan for a Rotational Outdoor Piggery
- Land and Water Protection Measures for Rotational Outdoor Piggeries
- Soil Monitoring for Rotational Outdoor Piggeries.



Example of movable farrowing hut



Example of movable dry sow or grower shelters



Example of movable self-feeder



Example of wallow water supply that is readily movable



References and Further Reading

Australian Pork Ltd 2011, The use of EM technology to determine nutrient distribution in free range pig areas, Australian Pork Ltd Fact Sheet, Australian Pork Ltd, Deakin.

Benfalk, C, Lindgren, C and Rundgren, M 2005. Mobile and Stationary Systems for Organic Pigs – Animal Behaviours in Outdoor Pens, accessed from <http://orgprints.org/4313/>

Eriksen, J, Hermansen, JE, Strudsholm, K and Kristensen, K 2006. 'Potential loss of nutrients from different rearing strategies for fattening pigs on pasture', *Soil Use and Management*, vol. 22, pp. 256-266.

Quintern, M and Sundrum, A 2006, 'Ecological Risks of Outdoor Pig Fattening in Organic Farming and Strategies for Their Reduction—Results of a Field Experiment in the Centre of Germany', *Agriculture, Ecosystems and Environment*, vol. 117, pp. 238-250

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