



FACT SHEET

LAND AND WATER PROTECTION MEASURES FOR ROTATIONAL OUTDOOR PIGGERIES

Outdoor Piggery Fact Sheet Series
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Adopting good land protection measures helps to preserve or enhance the productive qualities of the soil and prevent off-site impacts. Rotational outdoor piggeries can sometimes pose a risk to the environment through unsustainable soil nutrient levels, soil structural decline and poor land protection measures. Suitable siting, planning and design; dynamic management; and a commitment to site remediation reduce the risk of land degradation and related surface water contamination.

Soil Erosion

It is important to prevent soil erosion throughout both the pig and the crop, forage or pasture phases of the rotation. Erosion reduces land productivity by removing the nutrient-rich topsoil. It may also cause increased turbidity and nutrient levels in nearby surface water resources. Erosion is difficult to remedy and prevention is imperative.

Good site selection is important in minimising erosion from rotational outdoor piggeries. Erosion risk increases with higher slope; soil erosivity; and rainfall or wind intensity. Sites with a steep slope are generally unsuitable for rotational outdoor piggeries. Land with a flat to gentle slope is preferable. Sites with dispersible or light soils are also erosion-prone. Locations with higher rainfall intensities also have higher water erosion rates.

Maintaining groundcover over the land is the critical management strategy for minimising erosion. Groundcover is any material on or near the soil surface that provides protection for the soil against the erosive action of rainfall runoff or wind. It may include plant material (alive or dead), spent bedding and other cover materials providing these will not be carried away in rainfall runoff or blown away by the wind. Since attached plant material is more effective than dead plant material or other light matter lying on the soil surface it is recommended that it make up the majority of the groundcover. Groundcover prevents erosion by leaving soil less exposed to wind and rainfall runoff, promoting soil properties that increase rainfall absorption, and intercepting runoff preventing it from becoming erosive. Maintaining groundcover in pig paddocks year-round is challenging and dependent on selecting a suitable stocking density for the locality and soil type.

Secondary Erosion Control Measures

On sloping sites, contour banks can be constructed to slow the flow of water across the paddock, thereby reducing erosion.

Other structures can reduce the risk of eroded soil reaching waterways. Vegetated filter strips (VFS) or buffers below piggery paddocks can effectively prevent eroded soil and nutrients from reaching waterways. VFS's are continuous vegetated buffer strips at least 10 m wide that are located immediately downslope of the entire paddock area. Ideally these consist of a runner-developing, non-clump forming grass species. VFSs reduce the nutrient concentration of runoff by trapping soil particles and by slowing the water flow rate which increases infiltration. Generally, wider VFS's can trap greater quantities of eroded soil. For sites with greater slope, higher rainfall intensities or erosive soils wider VFS's are recommended.

As an additional control, or where there is high risk of waterway contamination, terminal ponds sized and located to catch the first 12 mm of runoff from the piggery paddocks and other land within the same catchment area can effectively minimise nutrient contamination of surface water resources. These work primarily by capturing the runoff containing the most nutrients. However, they also slow the flow velocity, promoting settling of suspended soil from the runoff. Runoff caught in terminal ponds needs to be irrigated on land not in use as pig paddocks.

Monitoring

Regularly monitoring paddocks for signs of soil erosion or structural decline allows corrective action to be taken as needed. Depending on the location, soil properties and facility management, soil compaction can be an issue. This can have serious implications for the growth of future crops and also contributes to erosion.

Site Remediation

On completion of the pig phase, site remediation helps to prepare the land for the crop, forage or pasture phase. This generally involves removal of fencing, shelters, feeders and other paddock installations; remediation of compacted or eroded land; and wallows remediation.



If the soil is compacted or eroded, growing an ungrazed ley pasture crop on the area is recommended. The soil should only be cultivated when the moisture content is between wilting point and field capacity. Other soil compaction remedies will depend on the soil type and may include deep ripping and spreading gypsum. Badly eroded areas may need to be fenced off and excluded from agricultural uses.

Wallows tend to be fairly nutrient-rich areas of the pig paddocks. Locating them on areas with loam to clay soils or lining them with compacted clay reduces the risk of groundwater contamination. Wallows remediation typically occurs when they are decommissioned (e.g. for relocation) and on completion of the pig phase to allow for crop or forage production. This may involve discing or deep ripping the base and possibly applying gypsum; filling in the wallow with soil; and levelling to match the slope of the immediately surrounding land.

A forage crop or pasture should be given time to establish before commencement of the next pig phase.

References and Further Reading

Australian Pork Ltd, 2010. National Environmental Guidelines for Piggeries, 2nd Edition (revised), Australian Pork Ltd, Deakin.

Redding M and Phillips I, 2005. Land Application of Effluent Phosphorus, Australian Pork Ltd Project 1354, Australian Pork Ltd, Deakin.

Other Fact Sheets in this Series

- Developing a Nutrient Management Plan for a Rotational Outdoor Piggery
- Promoting More Even Distribution of Manure Nutrients in Rotational Outdoor Piggeries
- Soil Monitoring for Rotational Outdoor Piggeries

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Maintaining good groundcover levels effectively prevents erosion



Vegetated Filter Strips (VFS) protect watercourses



Wallows need to be remediated after the pig phase to prepare the land for the crop / pasture / forage phase

