

Dry Litter Technology

The dry litter technologies offer adaptable solutions for small-scale piggery operations; the technology focuses on beneficial use of nutrient resources through natural composting processes.

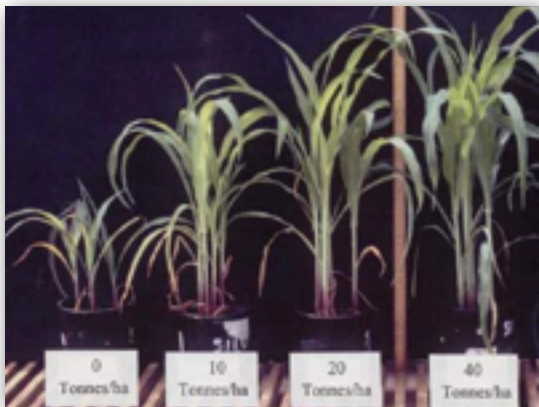
The modified dry litter technology, developed in Hawaii in the mid-1990's, incorporates the use of carbon materials, sloping pen floors, and requires no water for pen clean-up. The pig wastes are mixed into the carbon-rich materials and discharged out of the pens by the pigs. Through this process, odor is significantly reduced in the system. The carbon mix is then properly composted, resulting in a rich, organic soil amendment for crop production.

Portable dry litter, "composting piggeries", and other bedded litter systems have evolved as simple and practical alternatives from this novel technology.

Compost Benefits

In the dry litter system, animal waste is converted into a valuable soil amendment called compost. Compost benefit food production systems by increasing soil fertility and aeration, water-holding capacity and drought protection, soil organic matter content and microbial activity and enhancing plant disease suppression.

Photograph (Silva, et.al.) below shows the result of corn growth by the addition of varying levels of compost.



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The official project title is:
"Alternative waste management solutions for small-scale piggery operations: Educational outreach, demonstration and adoption for Pacific Island communities" and is supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture under Agreement No. 2009-51130-06048, Sub Award No. Y550082; and by CTAHR, Extension Program funds for multi-state and integrated projects.

WASTE MANAGEMENT OPTIONS FOR SMALL-SCALE PIGGERY OPERATIONS

2010



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IMPROVING WATER QUALITY AND FOOD SUSTAINABILITY

Water and Environmental Protection:

Pacific island nations face cultural and economic barriers to food self-reliance. However, it is imperative for each island nation to work towards agricultural sustainability for many reasons.

Surrounded by vast oceans, these small islands' fresh water streams and aquifers are charged by seasonal rains seemingly providing ample supplies of fresh water. But pure and clean drinking water is not always available 24/7.

The geology and sensitive ecosystems of these islands limit the volume of surface and groundwater storage. Steady population growth has led to population densities which are among the highest in the world. And current waste management practices of small piggeries contribute to the land-based activities that affect the quality of water resources.

Shallow groundwater, porous soils, and the concentration of both human and animals have resulted in serious human health implications, such as leptospirosis infections and deaths and high levels of bacterial contamination. Local health department officials have issued public warnings and enforcement orders related to municipal drinking water.

The over-arching goal of this project is to protect water resources, maintain intrinsic cultural values tied to the pig, and improve food security through improved, locally adaptable and sustainable livestock waste management production practices.

No Water Used = Reduced Pollution:

Typical piggeries in the Pacific Islands are small, with few numbers of pigs, producing pork for family or traditional celebrations and ceremonies. However, multiply the total number of piggeries spread across the limited land area and sensitive habitats, and one can understand the potential negative impacts to the environment's resources and people.

A survey of these piggeries show that most are dependent upon the use of clean water for pen washing, where polluted effluent (nutrients and pathogens) is often directly discharged into streams, mangroves, the ocean, or left to flow untreated and uncontrolled over the landscape.

These practices have led to significant contamination of water bodies and serious human health concerns. The goal of the project is to improve these situations through the introduction of alternative best management practices (BMPs). One focal area will be on the dry litter technologies, which offers a sustainable paradigm-shift for raising pigs and protecting the environment.



Project Objectives:

1. Provide continuing educational outreach for small-scale operations on alternative BMPs for piggery nutrient management, on-farm composting, and beneficial use of nutrients. Outreach efforts will target island communities of American Samoa, Majuro-RMI, Pohnpei-FSM, Republic of Palau, Guam, and the Commonwealth of the Northern Mariana Islands.
2. Develop standards of design and standard operating procedures and management of small-scale dry litter systems. Unify findings in a technical guidance document.
3. Re-introduce the modified dry litter technology to Republic of Palau, Federated States of Micronesia and Republic of the Marshall Islands. Conduct on-farm pollution risk assessment of a sample of piggery operations and conduct educational outreach on alternative BMPs.

Long Term Outcomes:

1. Improve water quality and environmental resource protection through adoption of alternative BMPs.
2. Increase nutrient recycling and utilization in an integrated farmstead food production system.
3. Improve food sustainability and water resource protection.