

## **Land Application of Livestock Manures in Hawaii and the American Pacific**

Management of livestock manures and effluent is a serious concern for Hawaii and the American Pacific due to limited land for disposal and the need to reduce environmental impacts.

Environmental impacts include the contamination of groundwater and surface water with nutrients like nitrogen and phosphorus and with disease organisms contained in manures. Solid manure and effluent from manure holding ponds accumulates in many dairy and hog operations. Land application and crop utilization are among the cost effective disposal options, however, information is inadequate for such uses in diverse soil and cropping systems in tropical islands. Research is required to determine how nutrients from manures become available to crops and how these nutrients are retained, released, and utilized when applied to tropical soils.

Specifically, this project is designed to:

1. determine the maximum application rates of livestock waste (effluent and manure) which can be safely used over time,
2. the interactions of nutrients (especially phosphorus) in tropical soils to which manures are applied, and
3. contribute to the development and adoption of environmentally sound, comprehensive nutrient management plans (CNMPs) on livestock farms in Hawaii and the American Pacific.

The procedures used in this project will be to:

- i. determine the fate and movement of nitrogen and phosphorus when manure or effluent is applied to various tropical soils which are representative of the region;
- ii. examine the potential phosphorus build-up from manure applications and the soil test levels corresponding to excessive phosphorus in the soil;
- iii. estimate the ability of different soils to retain and release phosphorus after livestock effluent and manure application to year round production of tropical grasses;
- iv. develop nutrient management planning procedures which can be easily used by farmers;
- v. deliver these planning materials to farmers and agencies which assist farmers in Hawaii and the Pacific Basin; and
- vi. incorporate these applied research findings and practical experiences in classroom instruction at the University of Hawaii and sister land grant colleges in the American Pacific.

This project will help livestock farmers comply with existing and anticipated regulations to protect the environment from contamination by manure. The manure management information and its delivery through public education will help to encourage farmers to treat livestock manures as a valuable resource rather than as a waste.