

PROGRESS REPORT AND CURRENT CONCEPTS
DAIRY WASTE DISPOSAL RESEARCH AND DESIGN PROCEDURES

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By

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Current emphasis on environmental quality has brought many industries face to face with the need to improve their waste handling methods. Agriculture is no exception. The misuse of pesticides is the most widely discussed agricultural transgression; however the most common agricultural pollutants are non-toxic, potentially beneficial, wasted nutrients. In small amounts, nutrient wastes are seldom a problem, but when drainage from heavily fertilized fields, large dairies, or other livestock operations is discharged into a waterway, there is likely to be a rapid growth of aquatic weeds, fish kills, or even odor and visible evidence of pollution in the water. The public and regulatory agencies have become aware of this. Fortunately, much of agriculture's problem can be alleviated by returning to some of the practices of a generation ago - the practice of recycling so called "wastes". Most agricultural "wastes" are misnamed. They are simply resources out of place. This is particularly true with animal waste.

Agricultural Engineering and other Departments of the Institute of Food and Agricultural Sciences are conducting research on many aspects of systems to handle, treat, and disperse animal wastes. Research projects include a multiple lagoon system on a large commercial dairy from which final effluent is spread over pasture by shallow ditches, and a study at the University's Dairy Research Unit to determine the effect on the soil-plant system of applying manure slurry, by sprinklers, to various crops. These systems show great promise as economical and effective means for handling animal wastes. Papers describing these projects and some findings and conclusions are available.

In 1970, the USDA provided incentive money for animal waste lagoon construction through the Agricultural Conservation Practices Program. It became desirable to formulate some criteria for the design of waste management systems without the benefit of research under Florida's climatic conditions with sandy soils and high water tables. A committee of representatives from the University and the Soil Conservation Service undertook this task early in 1970, and an Engineering Standard for Animal Waste Treatment Lagoons in Florida was devised, based upon research in other states adapted to this State's conditions. During the past year, thirty or more approved lagoons have been constructed by Florida Dairyman using this design standard.

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The Florida Department of Air and Water Pollution Control has approved lagoons designed in accordance with the standard discussed above. Also, they will accept other well planned systems provided final effluent is dispersed to the soil. Lagoons are not always the best method for handling animal wastes, however, they generally are the most economical when large volumes of wastes with high water content are involved.

The Department of Air and Water Pollution Control was created by action of the 1967 legislature (Chapter 403). The agency is headquartered at Tallahassee, with six regional offices located over the state, and has ultimate authority in matters pertaining to air and water pollution control. Several counties have local pollution control programs and agencies which prescribe rules and standards; however, all locally administered regulations must be compatible with, or stricter or more extensive than those imposed by DAWPC. At present, most agricultural waste systems will come directly under the jurisdiction of DAWPC, with local agencies being fully informed of planned construction.

We are gathering operational data as more lagoons are put into service, together with extensive data being collected at the multi-stage lagoon system in Manatee County. Observations which are not as yet statistically supported indicate the following:

Odor: Anaerobic lagoons in Florida require sixty to ninety days to stabilize after construction and first loading. Unpleasant odors are more noticeable during this period. Older lagoons produce some odor which is usually not detectable a few hundred feet from the lagoon. Anaerobic bacteria remain active throughout the year.

Loading Rates: Lagoon size established by the Standards appears conservative. Several lagoons with higher loading rates have been observed to operate acceptably, however sludge accumulation is more rapid.

Natural Sealing: This factor is very critical to the continued use of unsealed lagoons. Dairy waste lagoons appear to be self sealing even in sandy soils. Several large lagoons have been filled to levels above groundwater and continue to produce effluent constantly. This situation has been observed during the past few weeks with lagoons in the drouth area of South Florida.

Our research and current recommendations are directed to the ultimate return of animal wastes to the soil. On this basis, animal waste management amounts to the application of efficient handling techniques that do not create odors or other nuisances - or pose a pollution threat. The establishment of pollution control laws, agencies, and regulations need not be viewed with alarm by agriculture. We are developing methods to handle most wastes economically and effectively. Honest efforts to hold pollutants from agricultural sources to acceptable levels will earn the respect and cooperation of regulatory agencies.