Newsletter for the BIFS Forage Production & Dairy Manure Management Project

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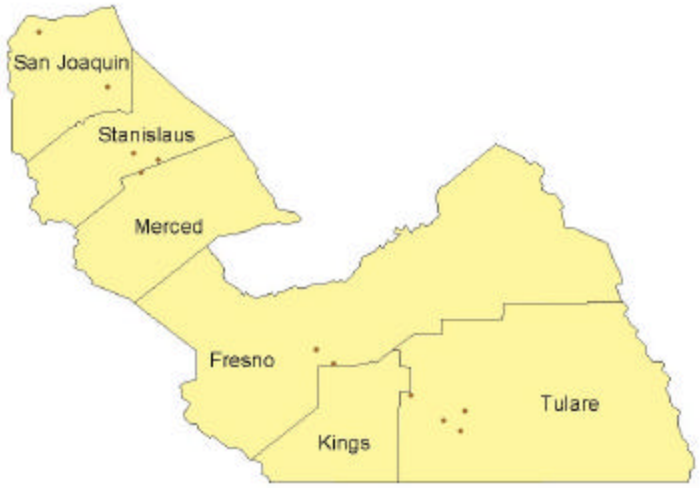
What has been happening in the world of dairy BIFS since the last newsletter? Lots of activity, as we gear up for summer and for a great corn and alfalfa growing season. This growing season the dairy BIFS participants will be making better use of the nutrients that are sitting right on the ranch, in the lagoons. Many project dairies are installing flow meters with which to measure lagoon water flow into the irrigation system. Flows and nutrient content of the lagoon water will be used to assess nutrient application to the fields. As we begin the corn growing season, soil samples are helping with decisions as to the need for starter, sidedress, and water-run fertilizer. We are looking forward to seeing how much value the lagoon water has to the dairies, and how much fertilizer won't be needed because of that value. Plus, we should all end up being better stewards of our soil and water resources.

The BIFS Project Objectives

Objective 1: *Work with selected dairies in the San Joaquin Valley to conduct field-scale demonstrations of improved methods for recycling liquid dairy manure nutrients to forage crops in both silage corn- and alfalfa-based crop rotations.* Eleven dairies from San Joaquin County in the north to Tulare County in the south are participating in the project, each setting aside from 10 to 80 acres of land for comparisons of improved versus conventional methods of lagoon water management.

Objective 2: *Work with the participating dairies to monitor and evaluate the economic and environmental performance of the improved methods compared to more conventional practices.* Data collection is already taking place, and evaluation will include yield comparisons, evaluation of fertilizer costs, and assessment of soil NO_3^- levels at season's end.

Objective 3: *Develop and implement an educational curriculum on dairy manure nutrient recycling, integrated with the Environmental Stewardship component of the dairy industry's Quality Assurance Program.* This objective will be a focus in the second and third year of the project, after the systems have been tested.



Dairy/Forage BIFS sites in the San Joaquin Valley of California

Flow Meter Field Day

"If we keep this up, Steve's pipe is going to look like swiss cheese!" This was Larry Schwankl's comment after deciding to drill another hole in Steve Wilbur's pipeline to install yet another flow meter. In a long stretch of pipe near Wilbur Bros. dairy lagoon, Larry, irrigation specialist at UC Davis, has installed three in-line magnetic flow meters (mag meters), and drilled holes for a couple of different sized insertion flow meters. A strap-on Doppler meter that doesn't require holes in the pipe has also been tested at the site. All the meters have been tested for ease of use and accuracy at different flow rates. A field day on April 27th drew 15 people to the site, where they heard results of the meter tests, observed the meters in action, and spent time discussing the pros and cons of the

different meters. Most of the meters performed very well and are similarly priced, making service and warranty important factors in determining which meter to purchase. Another field day planned for May 9th will be open to the public. Anyone who is interested in the use of flow meters for measuring flow of dairy lagoon water is urged to attend. This promises to be a great opportunity to see what meter(s) will fit best into your system. If you are interested in attending, please contact Alison Eagle at (559) 646-6589 or ajeagle@uckac.edu.

Lagoon Water N Content

In order to effectively manage lagoon water, dairy producers need to have an idea of the nutrient content of the lagoon water before it is applied to a cropped field. The most commonly considered nutrient in this analysis is nitrogen (N), which also tends to be the most limiting crop nutrient. Test results of lagoon water N content can help a grower to make more accurate decisions regarding amount of lagoon water to apply and the amount of commercial fertilizer that may also be needed.

However, the values for both typical forms of N in lagoon water, ammonium (NH_4^+) and organic N, can be extremely variable. In manure fresh from the cow, NH_4^+ comprises approximately 20% of the total N (Hutson et al. 1998). However, the manure in the lagoon can have anywhere from 30 to 70% of the total N in the NH_4^+ form, the readily available N. A considerable amount of N in lagoon water exists in other forms, mainly organic. This N is released more slowly as the organic matter decomposes, resulting in a slow release fertilizer effect.

The total amount of N in lagoon water is even more variable than the ratio of organic to NH_4^+-N. This depends on dilution with fresh water, use of lagoon water to flush lanes, animal feed composition, and presence of other waste products. Sampling of dairy liquid manure ponds found levels of N ranging from 114 ppm to 847 ppm, or about 25 to 200 lbs per acre inch (Meyer and Mullinax 1997).

Therefore, the high variability in N content of lagoon water makes it very important that samples are taken for analysis. These samples need to be representative of the entire volume of liquid manure applied to a field, so sampling from an appropriate location (eg. irrigation outlet pipe) is important. If the water concentration is variable over the course of an irrigation, more than one sample will reduce the error in calculations. A flow meter can then help in calculating the volume and thus the lbs N / acre applied.

The NH_4^+-N in lagoon water is assumed to be 100% available, but availability of organic N to the current crop is unknown. Some BIFS sites in summer 2000 will be comparing corn yields in plots where the organic N portion is assumed to be 20% available versus 80% available. This should contribute to some better ideas regarding the fertilizer value of organic N in lagoon water.

References: Hutson, J. L., R. E. Pitt, et al. (1998). "Improving dairy farm sustainability II: Environmental losses and nutrient flows." Journal of Production Agriculture **11**(2): 233-239.
Meyer, D.M. and D. Mullinax. (1997). "Nutrient content of dairy manure." Dairy Manure Management Series. University of California Cooperative Extension.

Calendar of Events

May 9, 2000—Flow Meter Field Day. Come see different flow meters in action and results from tests run by Larry Schwankl, irrigation specialist at UC Davis. The flow meters have been tested for accuracy and suitability in a dairy lagoon water application. This field day is open to the public. For more information, contact Alison Eagle, phone: (559) 646-6589 or email: ajeagle@uckac.edu

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