Newsletter for the BIFS Forage Production & Dairy Manure Management Project

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Dairy BIFS participants are winding up the silage corn season having grown 117 out of 505 acres of enrolled project land without any commercial nitrogen (N) fertilizer. On another 178 acres, commercial N fertilizer was reduced by up to 200 lbs / acre compared to conventional practices. As harvest results come in, we'll see if the fertilizer savings also returned good yields.

This newsletter contains some results from the berseem clover overseeding on alfalfa, flow meter information, and expert comments on groundwater. Also note the two field tours this fall.

Flow Meters and Dairy BIFS Cooperators

Flow meters for measuring dairy lagoon water flow are an important component of the BIFS project. Out of the 11 Dairy BIFS cooperators, nine currently have flow meters installed or in process. Three participants are using Marsh McBirney* insertion meters. These meters require some set up time, with a calibration, which so far has been done by Cooperative Extension personnel. The meters need a small hole in the pipe (2 inch diameter), and they can be removed easily and moved to another location. The other six participants are using either Water Specialties* or Danfoss / Emco* mag meters, which are attached to the pipeline via flanges.

Danfoss, ISCO, Marsh McBirney, and Water Specialties meters at flow meter test in Tulare County

All the meters require a power source, either 110V AC or 12V DC battery, a straight run of pipe, at least 10 pipe diameters upstream and 5 pipe diameters downstream of the meter, and a full pipe. These requirements have necessitated some modifications on many of the dairies, ranging from placing a piece of PVC pipe between two lengths of flexible hose to intricate above- and below-ground pipeline adaptations.

The project participants have used these flow meters to record flow rates (in gallons per minute) and total flow (in gallons). They have also collected samples of the lagoon water, and most of the dairies have installed a small valve to aid in collecting samples. It is important to collect a sample of the same material for which you are measuring the flow. The nutrient content of the sample, the flow rates, irrigation time and the area covered are then used to calculate nutrient application to the crop.

*Product names are provided for the convenience of the reader. No endorsement of products named or criticism of other products is implied.

Ask the Expert – Nitrate in Groundwater

Q—I have a dairy. What are the chances that there is anything at all wrong with my groundwater?

A—Not all groundwater is equally susceptible. There is deep groundwater (say, 500 to 2,000 ft below the ground surface), not so deep groundwater (200 to 500 feet) and also shallow groundwater directly underneath the water table. Groundwater closer to the water table has a higher chance of being impacted by human activity.

So, if you ask whether there is anything wrong with your 700 ft deep irrigation well - probably not. But the story may be quite different with your 150 ft deep domestic well or a 50 ft deep monitoring well. Chances are that

your shallow groundwater under corral areas and fields receiving regular liquid manure applications has elevated salinity and nitrate levels, especially within 20 to 50 of the water table. Even your domestic well at 100, 150, or 200 feet depth may have somewhat elevated (although not necessarily dangerous) nitrate and salinity levels. The nationally recognized health limit is 45 mg/l nitrate (the same as 10 mg/l "nitrate as nitrogen"). I highly recommend that you have your domestic water supply tested regularly (once or twice a year), at least for salinity, nitrates, and bacteria. You can do this through the county health department or a private laboratory. The information from a private lab is confidential and does not have to be reported to any regulatory agency.

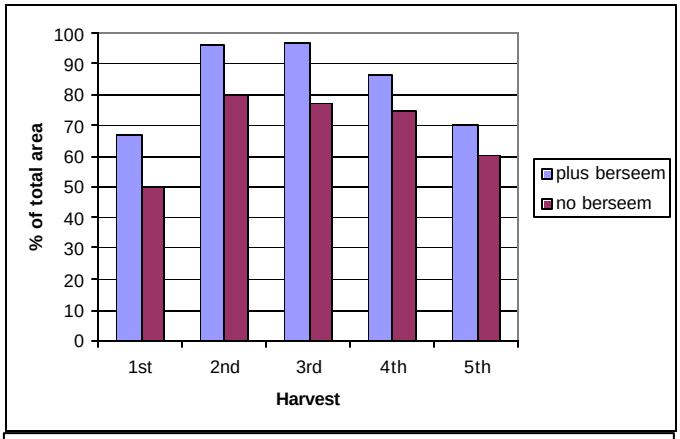
Q—Why is nitrate in groundwater such a big issue?
A—High nitrate levels in drinking water can cause "Blue Baby Syndrome". Nitrate in babies' (human and animal) stomachs can form nitrite, which is absorbed into the bloodstream, where it bumps oxygen off the blood cells that supply the body with oxygen. The baby then suffocates from a lack of oxygen (hence the name!).

Over the past four decades, there have been very, very few cases of blue baby syndrome in the United States due to strict enforcement of the maximum allowable nitrate level in public water systems. This has a bit of a "safety zone" built in, but if nitrate levels are above 45 mg/l, pregnant mothers and young children should definitely switch to bottled water. Boiling does not remove nitrate. High nitrate levels in groundwater are a sensitive community issue that needs much foresight, because once groundwater is contaminated, it takes years or even decades to clean it up again. *Thomas Harter, Groundwater Specialist, UC Davis.*

Overseeding Alfalfa with Berseem Clover

Using berseem clover as an overseeding crop for older alfalfa crops has been suggested by UC researchers as an effective way to increase forage yield in the spring. Berseem clover begins growing earlier in the season than alfalfa, allowing it to compete with early weeds, take up manure nutrients at a time when space is needed, and give good quality forage yield in the spring. Two of the BIFS sites experimented with berseem overseeding for the spring of 2000, planting the berseem in October and November of 1999. At one site weed pressure and the dry early winter resulted in very poor stand establishment as well as almost complete death of the alfalfa crop.

However, the other site gave good results as berseem clover overseeding increased yield by 0.3 tons/acre (dry) over five harvests. The berseem overseeding also reduced weed pressure and resulted in more of the total area covered by crop (see Figure).



Ground area covered by alfalfa and berseem crop (vs. bare ground and weeds) as affected by berseem overseeding

Calendar of Events

September 21, 2000—Flow Meter Tour/BIFS Field Day. This tour will visit four dairies in Stanislaus and Merced Counties where you will see flow meters and hear about manure management improvements on these dairies. Growers will share some of their experiences in working with flow meters and other management practices.

October 25, 2000—AgStar/BIFS Field Tour. Join us on this bus tour of dairies in Tulare County who are improving their manure management practices. Topics addressed will include air quality issues, measuring nutrient application using flow meters, and results from the BIFS 2000 corn silage trials.
For more information on either tour, contact Alison Eagle, phone: (559) 646-6589 or email: ajeagle@uckac.edu.

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