



Field Crop Notes

It's no secret that commodity prices are low and growers want to economize whenever it makes sense to do so. The following two articles, one on conservation tillage and the other on nutrients in dairy lagoon water, may offer opportunities for saving money in the future.

Conservation Tillage Conference and Field Day - June 26 *(see flyer at end of newsletter)*

Conservation tillage has become a widespread practice in many parts of the Midwest and eastern states. In fact, as of 1997 more cropland on a national basis is farmed using conservation tillage practices than using standard tillage practices. Conservation tillage production practices are based on the goal of reducing primary tillage operations such as plowing, ripping, disking, and chiseling. The term includes no-till but also any practice that reduces tillage operations.

In California adoption of conservation tillage has not been widespread for various reasons. In cotton production, plow-down requirements make no-till impossible and reduced tillage difficult. There is current research in cotton to develop a system that would cut and bury stalks with a minimum of disturbance to the soil. While progress has been made, a completely workable system for all soil types has not yet been perfected for incorporating cotton stalks without major tillage.

Another reason for slow adoption is that pre-emergence herbicides are the primary weed control method used for many crops. For most of these herbicides, soil tillage is the incorporation method of choice because rainfall is not dependable under California conditions and most growers don't have

sprinklers. For some crops, such as blackeyes, there just are not any post-emergence herbicides registered for use. For other crops, until the development of Roundup-Ready varieties, the selection of post-emergence herbicides was not wide enough to depend on them alone for weed protection. A third reason that conservation tillage is not widespread here is that specialized equipment is often needed because of increased crop residue when planting. Despite these drawbacks, there is increasing interest in conservation tillage in the state. A few Tulare County growers have even tried planting corn directly into winter forage stubble and were successful in establishing a stand.

Benefits of conservation tillage are reduced tractor use, reduced labor and fuel costs and reduced time in field preparation. Other benefits, which are not so easy to measure, quantify and put on a ledger sheet, might include increased soil organic matter, better soil tilth, and reduced dust emissions. Increases in soil organic matter and tilth could help with improved water infiltration and water holding capacity. On the other hand, there are concerns about the build-up of soil compaction after a few years of reduced tillage and questions if root diseases will become more prevalent.

It is difficult to do conservation tillage research on commercial farms because special equipment is needed, several years are needed to look at long term effects, and changing one aspect of management often requires changes in cultivation, irrigation, or harvest methods. Therefore most work has been done on field stations or in relatively few places where a grower is just really interested in exploring and developing methods that work with his/her management and conditions.

Continued on next page

For those interested in reduced tillage, you will not want to miss **Conservation Tillage 2001**, a conservation tillage conference/field day on Tuesday, June 26, 2001, at the U.C. Westside Research and Extension Center near Five Points in Fresno County. (The same information will be repeated in Davis on Thursday, June 28 if you can't make the 26th meeting). Conservation tillage equipment will be demonstrated, producers who have tried conservation tillage will be present, and research updates will provide the opportunity to learn about conservation tillage approaches being evaluated in California. Please see the announcement at the end of this newsletter for more details and registration information.

Saving Money on Nitrogen Fertilizer

If you use dairy lagoon water for irrigation, you can buy less nitrogen fertilizer (and potassium and phosphorus as well). The price of nitrogen fertilizers has increased this past year with the increase in the cost of natural gas (natural gas is used to produce nitrogen fertilizers). With the cost of fuel and water (or at least the cost of power for obtaining groundwater) also increasing, the value of nitrogen contained in dairy lagoons becomes even more apparent.

A basic challenge with using dairy lagoon nitrogen is knowing how much nitrogen is being applied. In many cases, applying it using "standard operating procedures" results in too much at the wrong time or not enough when it is really needed. To determine the amount of nitrogen being applied, 3 things have to be known:

- 1) concentration of nitrogen in the lagoon water (this will be nitrogen in the ammonium form and the organic form),
- 2) the amount of lagoon water used in the irrigation (determined either by a flow meter - the easy and most accurate way, or pond drop, or pump output), and
- 3) the number of acres irrigated.

Flow meters for lagoon water are different from propeller meters commonly used for measuring irrigation water. With some modifications, such as installation of a flow meter and a valve to regulate flow, lagoon water nitrogen can be managed to match the nitrogen application rates with crop nitrogen demand. Even without controlling the nitrogen rate, it is necessary to know what was applied in order to cut back or completely eliminate additional commercial fertilizer with confidence that yields won't be reduced. Pond drop and pump output require much more management time for figuring the amount of lagoon water used in an application and will not be as accurate as flow meters. (For more information on the types of flow meters used for lagoon water, please give me a call).

Just how concentrated is nitrogen in lagoon water? Unfortunately there isn't one value that is true for all lagoons or even true for the same lagoon over the course of a year. In a survey of a number of dairies in Stanislaus and Tulare counties, ammonium nitrogen ranged from a low of 47 ppm to a high of 1085 ppm. Parts per million (ppm) x .226 = the lbs of nitrogen per acre-in of water so in these samples the nitrogen ranged from a bit over 10 lbs N/acre-in to over 245 lbs/acre-in. More common ranges were from 200 to 400 ppm (45 - 90 lbs N per acre-inch). A laboratory analysis or a recently developed "quick test" can determine the ammonium nitrogen concentration and estimate the organic nitrogen level.

As an example of how to figure out the nitrogen applied in an irrigation in which lagoon water was mixed with fresh water, let's start with the quick test that would determine the concentration of nitrogen. If the quick test showed the ammonium nitrogen was at 328 ppm and the organic nitrogen was at 85 ppm we can calculate:

$.226 \times 328 = 74$ lbs nitrogen/acre-inch from ammonium which is immediately available to plants,

Continued on next page

and
.226 x 85 = 19 lbs N in the organic form per acre-
inch of water (organic nitrogen will become
available to plants as the organic matter
decomposes)

Then the total volume of lagoon water used in the
irrigation was 2,579,630 gallons (measured with a
flow meter) and, finally if the field was 38 acres,
then we can calculate that 2, 579,630 gallons /38
acres = 67,885 gallons/acre
and, 67,885 gallons /27154 gallons/acre-in = 2.5
acre-in of lagoon water per acre
2.5 acre-inches x 74 lb N/acre-in = 185 lbs N per

acre of immediately available nitrogen was applied,
and
2.5 acre-in x 19 lb N/acre-in = 47 lbs/N from the
organic form was applied which would become
available over time.

When timed with when the crop needs nitrogen,
lagoon water in many cases may be able to provide
all that is necessary. But to know that for sure, the
lagoon water needs to be analyzed and the amount
applied needs to be measured. I have the
instruments to do the "quick test". Please give me a
call if you would like to have your pond water
analyzed.

Sabbatical Leave - Steve Wright

I am taking a sabbatical leave beginning May 22,
2001. I will be visiting research scientists and
growers in other states and countries. I look
forward to returning at the end of February 2002
with some new skills and ideas.

Please contact the following people if you have
any questions during my absence.

- **Cotton or Agronomy**, call Bruce Roberts
at 559/582-3211 ext 2742
- **Weed control** or Small Grain, call Ron
Vargas at 559/675-7879 ext 212
- **Winter Forage**, call Carol Frate at 559/
685-3309 ext 214
- **On-Going Research**, call Lalo Banuelos
at 559/685-3309 ext 234
Steve Wright, Farm Advisor

Open House 1-3 p.m., Friday, June 29, 2001

By now all of you probably know the Cooperative Extension office (and the Ag Commissioner's office) are
now located on S. Laspina St. in Tulare across from the International Agri-Center office. All of you are
invited to an Open House on Friday, June 29th, to tour the new building and have some refreshments.

New Phone Number and System

Those who have tried our new phone number
have discovered we now have a more modern,
but less personal, phone system. When you get
the automated system, if you want to speak to a
person press zero. To leave voice mail for me,
use extension 214.

We are short two secretaries and leaving
messages on voice mail, instead of having a
secretary take the message, will help out our
front office staff. I can access voice mail
messages from other phones so I can return your
call even if I don't stop by the office at the end of
the day.

**Carol Frate, Farm Advisor
(559) 685-3309 ext. 214**