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KRCD
Kings River Conservation District

Water. Power. Environment. Reliable resources for the Valley.

IRRIGATION NEWS

Good Fertilizer Management is a Must

Fertilizer, like water, is a cost that growers must manage properly. Fertilizer costs are rising in direct relation to the cost of the energy necessary to produce and apply them. The over application of a fertilizer runs the risk of groundwater contamination, surface water contamination via erosion or off site movement of tail water, as well as increased pest control costs. It is important that a grower budget their fertilizer applications to insure that the materials are applied to the crop when it is needed most.

Sound fertilizer management begins with a soil analysis. The soil acts like a bank account for the crop, carrying balances of water and nutrients from season to season, waiting for the crop to make its withdrawals. How much of any one nutrient present within the soil depends upon the parent material of the soil, the previous crop and fertilization practices.

A typical soil analysis will include the major nutrients of nitrogen, phosphorus and potassium. Other nutrients that may be mentioned include sulfur, calcium, magnesium and some of the minor nutrients. The results can be reported in either parts per million (ppm) or pounds per acre.

Which fertilizer formulation and application method is best? There is no correct answer to that question. Some crops are more sensitive to the fertilizer formulation than others, and price will be a determining factor as well. Dry formulations work well regardless of the application method (band or broadcast), and the mix can be tailored to the needs of the crop. They are typically applied prior to planting for field crops or early in the spring for permanent crops.

Once the season is under way, plant tissue samples should be collected to determine the nutritional status of the crop. If a healthy crop is present, additional fertilizer may be recommended to support the load. At this point, access to the field can be restricted and the most cost effective means to apply additional fertilizer is with the irrigation water.

The grower's options at this point are limited to liquid fertilizers or anhydrous ammonia. Each has its advantages and risks. Anhydrous is dangerous to handle, and can be difficult to meter out, but it provides the most nitrogen per unit of material (83 percent) of any fertilizer. It will burn any foliage it comes in contact with, and should only be handled by trained personnel.

Liquid fertilizer formulations are generally safe to handle and easy to apply. They can be applied as direct soil injection, as a carrier in pesticide applications, or directly by irrigation water. Irrigation applied fertilizer has the advantage of not damaging the plants or compacting the soil during application. Injection knives do not prune roots, the tractor or its toolbar does not damage plants, and the application can occur after the rows have closed over.

Given the current climate regarding the quality of surface waters within California, and the growing concern over groundwater quality and usage, it is important to discuss the regulations regarding the mixing of chemicals into irrigation water.

Fertigation is defined as the application of fertilizer materials with irrigation water. Chemigation refers to the application of pesticides with the irrigation system. While the basic requirements for both are similar, care should be taken to insure that you are in compliance with the strictest requirement when performing chemigation. Consult with the label restrictions on the material you are applying.

Common to all the requirements is a physical means of backflow prevention. There are two common methods used to achieve this. The first method is a physical separation between the discharge and the irrigation system. This prevents the formation of a siphon, which can draw "contaminated" water back into the source. When using ditch water, the intake for the irrigation system is located at the highest point of the irrigation system.

(continued on back page)

KRCD Irrigation Services Offered at NO COST to Growers in the District

Field Evaluation Services

☐ Determine the uniformity of a drip, furrow, border, or sprinkler system.

Best month to evaluate _____

☐ The Irrigation pump also needs testing.

Type of System _____

Type of Crop _____

Acres _____

Contact Person:_____

Phone:_____

Mail this form to:

Eric Athorp

Kings River Conservation District
4886 E. Jensen Avenue
Fresno, CA 93725

Or email your information to:
eathorp@krcd.org

Good Fertilizer Management is a Must (cont.)

When the water is shut off, the water naturally drains away from the source. When a pump is used, the discharge must either be located above the highest level that water within the standpipe could reach (an air gap) or a backflow prevention valve must be installed.

A backflow prevention valve is a spring loaded valve that opens while the pump is running, but as soon as water begins to retreat into the pipe column, the spring closes a rubber plate onto the discharge pipe, preventing the movement of water into the well. A vacuum breaker valve (air vent) must be located between the pump and the backflow valve to allow air into the pipe column as the water retreats.

Pressure systems typically have two available points for chemical injection, before or after the filtration system. Many feel that the best place to inject is upstream of the filters, where any precipitated material can be filtered out before it gets to the emitters. For those that are only applying liquid fertilizers, downstream of the filters is preferred. This prevents the discharge of material in the backflush water.

In systems that are designed to inject pest control chemicals, the use of check valves at the source tank and at the injector site is required. This prevents the pressurized water from being forced backwards through the system and into the source tank. These valves can also be electrically controlled, so that they automatically close when the power is shut off.

A simple method of material injection is through the use of a venturi. This device relies on the pressure differential between the upstream and downstream sides of some device within the system. Some growers choose to use a throttling valve to create this differential but this reduces the overall efficiency of the pumping plant by creating excess pressure and restricting flow. Others rely on the natural difference in pressure created by the filter station. The injected material is introduced into the water stream as the high-pressure water moves into the lower pressure side of the venturi.

Another common method is the use of an injector pump. This pump takes the source water, raises the pressure, runs the pressurized water through a venturi and discharges the mixed water into the system. Some pumps are set up to directly pump the material into the water stream at controlled rates. These systems are more common on acid injection systems, as it minimizes the piping involved.

Calibration is also a key factor in saving money on fertilizer. The first number that a grower needs to know is the rate of irrigation within the field, in acres/hour. The next number the grower needs is the pounds of material per gallon of fertilizer. If the target application is 35 pounds per acre, the irrigation rate is 5 acres per hour and the fertilizer has 10 pounds per gallon of the desired nutrient, then the rate should be set at 17.5 gallons per hour (35 pounds/acre x 5 acres/hour divided by 10 pounds/gallon equals 17.5 gallons/hour), or 37 ounces per minute (17.5 gallons/hour x 128 ounces/gallon divided by 60 minutes/hour equals 37.3 ounces/minute). Any change in irrigation rate requires a corresponding change in application rate to maintain a uniform application.

If you have any questions regarding the precautions needed for irrigation-applied fertilizers, or any other irrigation related question, call Eric Athorp at (559) 237-5567, ext. 117.

AgLine Menu Options

In order to make your usage of the AgLine phone system easier, here is a quick guide to the menu options. The Agline phone number is (559) 237-4800.

Option 1 is **Reference ETo**, as measured at the Kearney Ag Station, Parlier.

Options 2, 3, and 4 relate to Tree and Vine crops. **Option 2** is the **Predicted water use** for the next 7 days, **Option 3** is the **Actual water use** for the last 7 days, and **Option 4** is for **Season to Date.**

Field and Row Crops are covered in Options 5, 6, and 7. **Option 5** is the **Predicted water use** for the next 7 days, **Option 6** is the **Actual water use** for the last 7 days, and **Option 7** is for **Season to Date.**

IRRIGATION
N E W S

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For more information contact
Eric Athorp at
(559) 237-5567 ext 117
www.krcd.org

Kings River Conservation District
4886 E. Jensen Avenue
Fresno, CA 93725-1899

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