Volume 16 No. 1 January - February 2005

Water. Power. Environment.

KRCD
Kings River Conservation District

Reliable resources for the Valley.

IRRIGATION NEWS

CIT's Pump Repair Program

The Center for Irrigation Technology is an independent testing and applied research facility located on the California State University, Fresno campus. Its mission, since its founding in 1982, has been the improvement of irrigation technology and water management. By testing irrigation products and educating growers on their benefits, CIT has provided a knowledge base that helps growers cut production costs related to farm water management.

One cost to growers that CIT hopes to address is that of pumping water. "Growers just don't realize just how much money can be saved if their pumping plant is operating at its peak efficiency, especially if they run their pumps continuously during the irrigation season" says John Weddington, manager of the Pump Test and Repair program at CIT. "If you can improve the efficiency of the pumping plant by getting more water output for each kilowatt-hour, a grower can save money by reducing total operating time per irrigation season."

John Weddington (left) and Bill Green of CIT's Agricultural Pump Efficiency Program.

CIT's program is funded through a grant from the state Public Utilities Commission (PUC). CIT subsidizes pump performance tests for electric and natural gas powered pumps for agricultural accounts that pay the Public Goods Charge on their bills. This subsidy can cover pump test costs up to $200 per well. The grower covers costs over and above this limit. "Since the Public Goods Charge is the source of our funds, only those who have paid this charge are eligible for the subsidized tests and potential rebates for covered repairs," says Bill Green, Education Manager at CIT. "Potentially, a grower can get up to 50 percent of the invoiced repair cost for repairs to their pump." It should be noted that this covers only repairs to the pump assembly, not repairs to the power source (the electric or natural gas engine).

The program consists of four components. First is the education program, conducted as a series of seminars using a mobile demonstration unit that can simulate various pumping situations. The demonstration shows how pumping costs change as the efficiency of the pumping plant is altered. This can simulate the effects of using a flood pump on a drip system application, or the effects of increased lift requirements due to falling water table levels or problems with the well itself.

The second component is the pump testing program. This program was instituted to replace the service provided by some utilities to evaluate pump performance. The program recognizes that the vast majority of agricultural wells do not run efficiently, and as such, cost the growers a great deal more in energy costs than is necessary. The program is statewide, with an approved list of testing professionals that handle all the necessary paperwork for the grower.

A related component is the rebate program for pump repairs. Qualified repairs are eligible for rebate money based upon the energy savings realized. Covered repairs include well casing repairs, removal of high-loss valves within 10 feet of the wellhead, and repairs to the pump assembly itself. Pump tests performed by the KRCD are accepted by CIT for the repair rebate program.

Finally, CIT provides technical assistance in filling out the applications and answering questions related to pump tests, repair eligibility and water management. For complete information about the program, including eligibility and restrictions, contact CIT at (800) 845-6038 or if you have computer access go to the website www.pumpefficiency.org.

IRRIGATION SYSTEM AND PUMP EVALUATIONS

KRCD's On Farm Program is available to evaluate your irrigation and pumping systems at no cost to you. If you had any irrigation related problems during the course of the season and want to isolate the cause, give Eric Athorp a call at (559) 237-5567 extension 117. Pump tests typically take 30-60 minutes to complete; irrigation evaluations run approximately 3 hours for most systems.

Call TODAY (559) 237-5567 ext 117.
It is a NO COST service to you.

The Gray Days of Winter

Living in central California guarantees two things: warm, dry summers and gray winters. Interestingly enough, the same basic geographic and climatic features cause both conditions. Air is trapped by the surrounding mountain ranges, and descending air prevents the movement of the trapped air out of the valley. So, how do these features work to impact the climate of the Central Valley?

The first thing to do is to look at the Valley's specific geography. The valley is literally surrounded by mountains that range from 4000 feet tall to the west to over 14,000 feet to the east. This essentially creates what has been described as a "bathtub," high walls around a relatively flat floor. The only problem with this analogy is that there is no natural drain for this tub.

The dominant climatic pattern over western North America is what is called a "high-pressure" ridge. In meteorology, high pressure is created in areas of sinking (higher density) air, the return loop of the convection system that drives the weather of the planet. As the air sinks, it compresses further, raising its temperature. This creates our stable weather patterns.

During the summer months, the warm air created at the surface doesn't have enough force to overcome the sinking air above it, so the air continues to heat. Eventually, the pattern shifts just enough that the warm air escapes, and cool air is drawn in from the coastal regions to replace it.

During the winter months, the air trapped at the surface eventually cools to the point where the available moisture begins to condense out (the dew point). When this happens, fog forms. Fog forms in two ways. First, a moist airmass moves over a cold surface, causing the moisture to condense. This is called advection fog. It is most common in the Midwest, when moist air from the Gulf of Mexico drifts over the snow covered plains. The second is called radiational cooling by which the soil surfaces radiate their heat away, evaporating any moisture at the surface. This evaporated water vapor eventually cools to the point of condensation, forming fog.

When storms do come to the valley, the associated airmass is usually saturated with moisture. If the conditions are right, this moisture is released in the form of rain or snow. Warm surface temperatures evaporate the moisture into the air, and the mechanisms for fog formation are primed again.

Eventually, the atmosphere stabilizes to the point where a low cloud deck forms at the boundary between the air already within the valley and the sinking air above it. The air at the surface, being colder, is denser than the air above. Normally, air temperature decreases as altitude increases. In the Central Valley, this pattern can be reversed briefly, creating what is known as an inversion layer. This layer traps whatever airmass is below it.

This cloud deck does two things. First, it blocks any energy from the sun from warming the surface by absorbing and reflecting the infrared energy. Second, this same layer absorbs and reflects what infrared energy that is released by the surface. This prevents the airmass above the surface from cooling down to the dew point, and no fog forms. Create a breach in this cloud deck, allow heat energy to escape and the lower airmass to cool, and the fog reforms.

As dreary as the gray days of winter may seem, they actually have some benefits. First, water consumption by many plants is near zero this time of year. This allows for any rainfall to be fully absorbed by the soil, rather than being evaporated away. Second, the high cloud deck keeps temperatures fairly constant, usually near the ideal threshold for the chilling of certain tree crops. Chilling is important in that it forces certain plant structures to rest for a period of time, thus improving their vitality in the spring.

The disadvantage is decreased air quality, as particulate emissions are trapped below the inversion layer. Eventually, these particles collect enough moisture from the air to fall out as drizzle, but the health effects persist. Another disadvantage is the slow recovery from extremely low temperatures, as the clouds prevent surface heating.

There are other factors that go with this topic, and entire textbooks usually only scratch the surface. Should you have any questions regarding this or any related topic, you can call Eric Athorp at 237-5567, ext. 117.

What a Difference a Month Makes

In the November-December issue of Irrigation News, we informed you that the current snowpack conditions stood at approximately 29.6 percent of the April 1st average. 30 days later, after the series of storms over the New Years holiday, that average increased to over 90 percent. Normal precipitation patterns from now until April 1st should bring the average to 100 percent. Some data points to the potential for a better year than that, with some estimates as high as 120 percent. Keep your fingers crossed.

IRRIGATION
N E W S
KRCD

Reprint freely with credit to:
Irrigation News, a bimonthly publication of the Kings River Conservation District

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

NON-PROFIT ORG.
U.S. Postage
PAID
PERMIT NO. 1687
FRESNO, CA

RETURN SERVICE REQUESTED