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KRCD
Kings River Conservation District

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

IRRIGATION NEWS

Devising Best Management Practices

One of the stated goals of the Central Valley Regional Water Quality Control Board's agricultural discharge waiver is the creation of best management practices (BMP) for growers. These BMP's represent a set of management practices that would reduce the risk of harmful runoff from irrigation or storm water into the "waters of the state."

Typically, the term "best management practice," is equated to a push to get the grower to reduce the usage of pesticides and commercial fertilizers. While this is a correct interpretation, it only represents half of the picture. The other portion is in the cultural practices used on a farm that would promote higher water use efficiency and reduce off-farm movement of water during a storm event.

No one practice will fit all situations. Each BMP must be individually tailored to specific conditions that each grower faces (such as crop, soil type, soil slope, irrigation practice used, special needs such as frost protection, and distance to a surface water body). The BMP must be practical for the individual grower (i.e. the cost of usage must not be more than the existing management practice) and compatible with the cultural needs of the crop grown.

A BMP that requires wholesale changes in management or cultural practices is not very likely to be implemented, whereas one that simply "tweaks" current practices or only changes a couple of things is far more likely to be successful.

A Dialogue On Discharge

The purpose of this article is to begin an open dialog with you, the growers who operate within the Kings River service area. The author would like your input on how you think you can best reduce pesticide and fertilizer usage, use irrigation water more effectively, and any suggestions on minimizing runoff during stormy periods. Comments received will be brought to the attention of other growers through this newsletter, with feedback encouraged. Submitted comments can be credited openly or anonymously. Growers have a tremendous amount of background knowledge about what works and what doesn't, and that knowledge would be a benefit to all.

Please send your comments to Eric Athorp, Kings River Conservation District, 4886 E. Jensen Ave., Fresno, CA 93725. Email can be sent to eathorp@krcd.org, or call (559) 237-5567, ext. 117.

Let's begin by exploring the subject of reducing runoff on sloping terrain where surface infiltration rates are low to moderate. These conditions are fairly common on the eastern side of the service area, an area dominated by citrus.

Because of the evergreen nature of this crop, pest management is a constant consideration. The chemistries used have changed over the years, as products that are more pest-specific have become available. Still, the chemical families of organo-phosphates and pyrethroids are considered a major contamination risk to nearby water bodies.

Cover crops and the use of compost or other mulches have been tested with varying degrees of success. The key for these techniques is the stabilization of the soil surface, and the formation of stable "macro pores" (large soil pores) where water can enter the soil profile quickly. Such pores are vulnerable to soil disturbance caused by cultural operations and to plugging in high intensity rainfall situations. Cover crops deplete the soil of moisture that may be needed later, or may harbor crop pests.

Construction of "dry wells" within the orchard may be a solution. These are essentially trenches that are run between each row of trees, perpendicular to the slope of the hillside. Each trench is responsible for the 20 feet or so of soil surface from the trench immediately uphill of it.

(continued on back page)

Sign up for Water Quality Coalition

KRCD is working to create a more complete database for Coalition membership within the Kings River sub-watershed. To do this, we have begun a directed mailing program to all landowners within the sub-watershed boundaries. If you have received this mailing, you are encouraged to return it as soon as possible. If you have not, contact the district office at 237-5567 and ask for the enrollment form. Participation in the Ag Waiver program is required by the Regional Water Resources Control Board.

Name: _____ Address: _____

Phone Number(s): _____ City: _____ State: ____ Zip: _____

After completion, please mail this portion to **KRCD, 4886 E. Jensen Ave., Fresno, CA 93725**.

PLEASE NOTE: If you have previously signed up, there is no need to sign up again.

A Dialogue On Discharge (continued)

Construction would be fairly simple. A four-inch wide, four-foot deep trench is placed at the centerline between the trees (careful to avoid any existing irrigation system installations) and is run perpendicular to the slope of the hillside. The trench is backfilled with pea gravel to a depth of three feet, thus creating a permanent pore space for the infiltrated water. Above the gravel is placed landscape fabric, which prevents the movement of surface soil into the gravel.

Compost is then placed within the remaining foot of the trench. The compost is used as a filtering agent for the surface runoff. Compost contains a large quantity of negatively charged sites that attract and hold the positively charged pesticide components within the runoff. Because compost is biologically active, these pesticide components can be biodegraded further within the compost layer. Another layer of fabric can be placed at the surface to protect the compost from erosion if desired. Compost is also more likely than the native soil to remain porous.

The advantages of such a system is that each trench is only responsible for the soil surface up slope of it, so the flow to each trench is limited. Each trench would only have to collect the surface runoff that fails to percolate into the soil surface, and as such would only come into use during high intensity or long duration rainfall events. The increased surface area afforded by the sides of the trench allow for more water to be stored within the soil profile, providing that the trench depth is sufficient. A one-foot column four-feet deep would have a surface area of 8.33 square feet into which to disperse surface water (two sides and a bottom).

One significant risk to this system is the introduction of higher than normal volumes of water to the subsurface. This situation could destabilize the hillside, especially in high slope areas. As slopes increase, decreasing the frequency of trenches may be of benefit. In areas of excessively high slopes, a more practical method of controlling runoff would be to contain it at the base of the hill. This would involve the sacrifice of some acreage to create a temporary basin. Such a basin could be used for irrigation return flows, or planted with annual grasses that would transpire the water away. Organic buildup within the basin would help trap any chemicals within the runoff.

The key to this system is that none of the trenches are interconnected. Nor do they contain any sort of subsurface drain to convey water out of the field. Inclusion of such piping would turn the system into a tile drain, and would leave the grower with yet another problem: what to do with the accumulated water within the sump.

Material costs for such a system are relatively inexpensive. Gravel costs about $26.50 per ton (material only), or $3.81 per cubic foot. A durable landscape fabric costs about 10 cents per square foot, with a typical roll having 900 square feet (three feet wide by 300 feet long). Compost costs $12 per yard (material only). So the net material cost is less than $5 per linear foot.

Trenching costs are highly variable, depending upon equipment rental rates and how fast a trencher can run through the soil. Labor costs are also variable. Most of these are one-time only costs. Compost may need to be replenished periodically, depending upon surface disturbance.

Naturally, this concept can be modified to suit individual conditions. The trench can be shallower, but the four-foot depth was selected to maximize the available volume for capturing runoff. The entire trench could be filled with compost, but the use of gravel insures permanent pore spaces for water infiltration. Shallower slopes could use fewer trenches (every couple of rows rather than every row). Ultimately, the final design is up to individual choice.

Grower feedback regarding this concept would be greatly appreciated.

FLOOD OPERATIONS SUSPEND ON-FARM PROGRAM

Flood releases on the Kings River has forced the district to utilize its personnel resources to maintain 24-hour flood patrols on its levees within the district. This reallocation of resources has forced the temporary suspension of the On-Farm Program within the district.

Once the flood release conditions improve or additional personnel becomes available, the On-Farm program will resume. We would like to thank you for your patience during this period.

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