Public Comment
Agricultural Expert Panel
Deadline: 5/14/14 by 12:00 noon

To the Expert Panel,

Please find attached a refined version of an example and point that I made during my presentation in San Luis Obispo. I believe that in order to solve the existing Nitrate loading problem associated with Agriculture, it is most important to establish an understanding of how government policies impact growing practices. In my opinion, the practice of "Pump and Fertilize" needs to be promoted in order to see improvement in the Nitrate Loading Problem in the production of shallow rooted crops. The attached document illustrates this point and I would like to submit the document as part of my testimony.

I feel that the second most important to factor is to focus on the importance of managing irrigation water such that its application does not leach applied fertilizer out of the root zone.

I feel that the third most important factor in the management of nitrate leaching in shallow rooted crops is the management of Soil Organic matter concentrations in the root zone.

I feel that all factors need to be ranked not only according to effectiveness in solving the problem, but also factor in the economic return on investment of dollars spent to increased productivity of crops. Many of the practices may more then pay for the expense of implementation in economic return to the ranch. If this can be pointed out to the grower then the implementation will be a much easier sell. I believe that analyzing these three practices will show more than pay back then cost to each individual operator with improved production and quality. I believe that it is vital to focus on the most important factors because it is so important in this day and age to make every dollar spent provide a return on investment in the eyes of a grower.

Thank you for your consideration,

George Adam
Grower

Compairison of different Methods of Mass Balance Nitrate Impact Analysis
Using Conventional 100% Applied Method vs "Pump and Fertilize" Method

Example 1 using a well with 20 Lbs NO3-/ Acre Ft **Example 2 using a well with 200 Lbs NO3-/ Acre Ft**

Example 1 using Low NO3- Well Water **Examples assume 1 Acre FT of Applied Irr Water**
Irrigation Water NO3- = 20 Lbs/Acre foot Broccoli Crop Budgeted N Need = 80 Lbs/Acre

Soil NO3-	+	Applied NO3-	+	Irr Water NO3-	=	Total NO3-Applied	vs	Crop Need =	Total Residual

Conventional 100% Applied Method of Analysis **(RWQCB Region 3 ?)**

10 Lbs/Acre	+	80 Lbs/Acre	+	20 Lbs/Acre	=	110 Lbs/Acre	vs	80 Lbs =	40 Lbs/Acre
				Less:		Residual soil NO3-			10 Lbs/Acre
		Net change in Groundwater NO3- from growing Broccoli Crop						**=**	**30 Lbs/Acre**

"Pump and Fertilize" Method of Analysis

				(35% available)					
10 Lbs/Acre	+	80 Lbs/Acre	+	7 Lbs/Acre	=	97 Lbs/Acre	vs	80 Lbs =	17 Lbs/Acre
				Less:		Residual soil NO3-			10 Lbs/Acre
				Less: Lbs of NO3- Available in applied groundwater =					7 Lbs/Acre
		Net change in Groundwater NO3- from growing Broccoli Crop						**=**	**0 Lbs/Acre**

Example 2 using High NO3- Well **Examples assume 1 Acre FT of Applied Irr Water**
Irrigation Water NO3- = 200 Lbs/Acre foot Broccoli Crop Budgeted N Need = 80 Lbs/Acre

Soil NO3-	+	Applied NO3-	+	Irr Water NO3-	=	Total NO3-Applied	vs	Crop Need =	Total Residual

Conventional 100% Applied Method of Analysis **(RWQCB Region 3 ?)**

10 Lbs/Acre	+	20 Lbs/Acre	+	200 Lbs/Acre	=	230 Lbs/Acre	vs	80 Lbs =	150 Lbs/Acre
				Less:		Residual soil NO3-			10 Lbs/Acre
		Net change in Groundwater NO3- from growing Broccoli Crop						**=**	**140 Lbs/Acre**

"Pump and Fertilize" Method of Analysis

				(35% Available)					
10 Lbs/Acre	+	20 Lbs/Acre	+	70 Lbs/Acre	=	100 Lbs/Acre	vs	80 Lbs =	20 Lbs/Acre
				Less:		Residual soil NO3-			10 Lbs/Acre
				Less: Lbs of NO3- Available in applied groundwater =					70 Lbs/Acre
		Net change in Groundwater NO3- from growing Broccoli Crop						**=**	**<60 Lbs/Acre>**

Well Options under each Method of analysis:

The best option under **Region 3 Method** would be to use the **low** nitrate well because of the 30 Lb increase in Groundwater NO3- per acre grown is better than the 140 Lb increase per acre grown using the **high** nitrate well.
The best option under **"Pump and Fert"** Method would be to use the **high** nitrate well because the 60 Lb decrease in Groundwater NO3- per acre grown is better then the "no change" shown using the **low** nitrate well.