

The On-Farm Water Budget Committee met July 12 at 3:30 pm. Attendees included Allan Wylie, Greg Sullivan, Bryce Contor, and Chuck Brockway.

We discussed the spreadsheets developed by Bryce to help develop constraints for the efficiency parameter in the on-farm algorithm. Bryce walked us through one of the

Economically-driven_irrigator_response_spreadsheets

- 1) we should only adjust values in the yellow cells
- 2) use consistent units
- 3) ETM = crop et at full yield
- 4) I_m – don't adjust = Irrigation depth for full yield
- 5) Y_m = maximum yield (i.e. 5 tons/yr)
- 6) P_m = price (i.e. \$75/ton)
- 7) Z =the impact of irrigation depth on commodity price-not decreased in yield, but reduced desirability of the commodity due to deficit irrigation
- 8) K =relationship between et and yield
- 9) ET_d = effective precipitation
- 10) B =consumptive use fraction of applied water

Bryce explained the difference between the Z and K parameters: K parameter illustrates the fact that deficit irrigation impacts yield on alfalfa, but 1 ton of alfalfa grown under deficit irrigation is still worth \$75; the Z parameter illustrates the fact that a farmer may not be able to sell potatoes grown under deficit irrigation.

In the chart just below the parameters, the red line represents the marginal value of applied water, and the blue line represents the demand for water.

We then looked at the CU_Fraction_Parameter_FromCropMix_20100706.ods spreadsheet. Bryce prepared this spreadsheet in Open Office because his version of Excel would not allow enough columns. However, we discovered that when we opened the spreadsheet in Excel, the equations were converted into values, so the spreadsheet did not work. If the spreadsheet worked, crop mix had an impact on maximum and minimum. There are graphs in column AF at row 120. The good news is that median efficiency is relatively stable at about 0.85 for sprinkler and 0.8 for gravity.

The plan is to use Bryce's spreadsheets to develop maximum and minimum efficiencies by entity, and efficiency appears to converge on the expected efficiency of small grains.

We then discussed the returns issue raised in the last meeting. The calibration run Allan prepared has completed, but Allan has not had time to fully work up the results. Allan did determine that in some reaches, returns represented as much as 50% of the total reach gain, thus it will be important to include constraints on this. Allan proposed including measured returns as calibration targets. Allan could write a program to read the htm file MKMOD outputs, or Allan could ask Willem to modify MKMOD to output

the data in a more PEST friendly manner. Chuck Brockway suggested that having Willem modify MKMOD would be the cleanest option.

Topics for next meeting:

- 1) Bryce will locate papers to support assumptions in the spreadsheets.
- 2) Bryce will redo the CU_Fraction_Parameter_FromCropMix_20100706 spreadsheet in a newer version of Excel so the equations are preserved.
- 3) Allan will confer with Willem regarding modifying MKMOD to output returns in a PEST friendly format.
- 4) Allan will prepare notes of this meeting to circulate among attendees for approval.