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April 17, 1990

11/17/06 conversation on staff

Sub: Irrigation Water Requirements
 To: Norton Ditch Company
 Salmon, Idaho

Mike Overacker, of the Norton ditch company requested assistance from the Soil Conservation Service in determining the amount of irrigation water required to supply a full season of water to crops on the ditch. They are in the process of applying for a water right under the Snake River adjudication procedure. For several reasons I am only able to do a very general analysis of this need. Some of the reasons are I have limited time, there are **33** irrigators on the ditch, various size tracts are involved, various types of crops are involved, different irrigation methods are being used, soils vary and ect. For this assessment I'm assuming two things: 1) flood irrigation and 2) a alfalfa-grass crop. These would be typical of the majority of irrigation methods and crops on the ditch.

Soils vary, but a typical map unit would be the Bromaglin complex. This complex is derived on old Salmon river terraces. This soil has a silt loam surface over a gravelly sandy loam subsoil. It has an available water holding capacity of about 4.5 inches in the top 60 inches. The normal rooting depth for the alfalfa grass crop is about 30 inches. The AWC in this depth is 2.5 inches. From this using a peak consumptive use of .25 inches per day during the peak growing season then $2.5 \times 50\% = 1.25 / .25 = 5$ day. These are from the SCS Idaho Irrigation Guide. This states that a 1.25 inch application is needed every 5 days during the peak months of July and August. This seems very close to the irrigation interval most irrigators on the ditch are using.

Also from the Irrigation Guide, a alfalfa-grass crop requires 24.60 inches of water gross and 21.15 net per season in this area. The 21.15 would be what's needed from irrigation. $21.15 / 1.25 = 17$ irrigations. $17 \times 5 = 105$ days. This would be about right if you put 10 days on the front of the season and 10 days on the back where irrigation would not be required making this a 125 day growing season. This seems very close since the growing season in Salmon is near 120 days.

Calculating the water needed to supply the 1.25 inch irrigation is not complicated. What is complicated is figuring the efficiency of application and efficiency of delivery of this 1.25 inches to the crop. A typical system

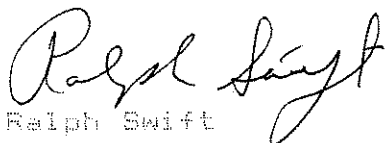
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is earthen ditches with irrigation dams. Fields for the most part are unleveled and are as the river left them years ago. Very little leveling has been done because of the gravel bars running through the fields. Based on what I have observed for the past 10 years the irrigation field efficiency runs about 30 to 35 percent. I base this not only on observation but from calculating field efficiencies from producers estimates of water used per season. Delivery efficiency is also very difficult since there aren't any measuring devices on the ditch or its field laterals. Again from observation this runs from 60 to 90 percent. I assumed 70 percent delivery for this estimate of water used.

I calculated the water needs per acre. Net requirement is $.25"/\text{day} \times 1\text{cfs}/24 \text{ acre inches}/\text{day} = .0104 \text{ cfs}/\text{acre}$. Gross requirement is $.0104/.35 = .0297 \text{ cfs}$ or $.0297 \times 50 \text{ in}/\text{cfs} = 1.49 \text{ miners inches}$. This divided by 70% is equal to 2.12 inches per acre. This could go to 2.47 inches per acre if a 30 percent irrigation efficiency was assumed.

There are some pros and cons in this amount of water used. In terms of water use only, these are very poor. However in terms of wildlife habitat that is created along the earthen ditches banks and in the swales that sub and create wetlands it's good. This letter is not meant to be a statement by the SCS as for or against these poor efficiencies but the affects of improving them may or may not be of benefit.



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