Irrigation Training Toolbox
Irrigation System Evaluation

Lesson Plan
Evaluating Data Obtained From a Furrow or Corrugation Irrigation

National Employee Development Center
Natrual Resources Conservation Service
Fort Worth, TX
October 1996

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COURSE:	Irrigation Systems Evaluation
LESSON TITLE:	Evaluating Data Obtained From a Furrow or Corrugation Irrigation
OBJECTIVES:	Give each participant field experience in plotting and evaluating data obtained from a furrow or corrugation irrigation.
TRAINING AIDS:	Projector and slides
METHOD:	Classroom discussion and supervision.
DEVELOPED BY:	West National Technical Center

IRRIGATION SYSTEMS EVALUATION
EVALUATING DATA OBTAINED FROM A FURROW OR CORRUGATION IRRIGATION

INTRODUCTION

BODY

A. Soil Moisture
   1. Determine the amount of moisture that was in the soil profile before irrigation. Total the amount of moisture determined to be in each significant layer of the root zone by both the estimating and computation procedure, D_i (on EXHIBIT - IWM - 1 and 4.)
   2. Determine the total moisture holding capacity of the soil profile in the root zone: D2.
      a. Estimating - on EXHIBIT - IWM - 4.
      b. From the physical properties of the soil and the use of feel chart, determine the available moisture holding capacity of each significant layer of the soil profile.
      c. Record information.
      d. Total the available moisture for the root zone of the soil profile.
   3. Measuring - on EXHIBIT - IWM - 1.
      a. From Speedy Moisture Tester measurements of soil at field capacity, compute moisture holding capacity of each layer of soil profile.
      b. Total the water holding capacity for the root zone of the soil profile.
   4. Determine the depth of application needed from the irrigation, D_n. (from data on EXHIBIT - IWM - 1 and 4 and record results on EXHIBIT - IWM - 8.)
   5. Determine intake rate (instantaneous) of the furrow during the last 1/4 irrigation: I_i.
   6. Determine the equivalent intake rate in "/hr I_e.
   7. Determine Soil Factor; K_s.
   8. Determine the average intake rate for the irrigation; I_a
   9. Determine depth in inches delivered to the area; D_d
   10. Determine depth infiltrated at top of field; F_t
   11. Determine depth infiltrated at bottom of field;F_b
   12. Determine average depth infiltrated in field; F_o
   13. Determine uniformity of infiltrated; U_i
   14. Determine time required to complete the irrigation; T.
   15. Determine field application efficiency; E.
   16. Determine irrigation frequency (minimum).; I.F.
   17. Recommendations.

SUMMARY

FURROW IRRIGATION EVALUATION

1. Farm _____ Field _____ Crop _____ Last Irrig. _____ Date_____

   Soil _____ WHC _____" IR _____ Stream Size/Furrow _____ Set _____

   Furrow Spacing _____ Length _____ Time of Set _____ Advance Time _____ Slope _____

   Depth of Appl. needed D_n = Moisture at FC _____" - Moisture before Irrig. _____ = _____

2. Depth of water delivered or applied D_d - $\frac{\text{Qgpm x 96.3 x T hrs.}}{\text{L x W}}$ = $\frac{\text{x 96.3 x}}{\text{x}}$ =_____'

3. Instantaneous intake rate I_i = $\frac{\text{gpm in} \_\_\_\_\_ - \text{gpm out} \_\_\_\_\_}{\text{Length in 100s of feet}}$ = ___gpm = ___ gpm/100'
   (during last 1/4 of set)

4. Intake rate equivalent I_e = $\frac{\text{I}_i \text{ (Inst. intake rate)} \_\_\_\_\_}{\text{(furrow spacing in feet)}}$ = _____ = _____"/hr.

5. Soil factor K_s from page 15-36 - Engr. Field Manual K_s = _____

6. Average intake rate $I_a = I_e \times K_s$ = _____"/hr. x _____ = _____"/hr.

7. Depth infiltered (top of field) F_t = (Ave. Intake I_a) x (Time at Top T_t)
   F_t = _____"/hr. x _____ hrs. = _____".

8. Depth infiltered (bottom of field) F_b = (Ave. intake I_a x (time at Bottom T_b)"
   F_b = _____"/hr. x _____ hrs. = _____".

9. Ave. depth infiltered $F_o = \frac{F_t + F_b}{2}$ = $\frac{\text{"+}}{2}$ " = _____".

10. Uniformity of application U_i = $\frac{\text{b}}{F_o}$ x 100 = _____" x 100 _____%
    "

11. Irrigation efficiency E = $\frac{\text{Depth needed } D_n}{\text{Depth applied } D_d}$ = _____" x 100 = _____%
    "

12. Required application time T. = $\frac{\text{Depth needed } D_n}{\text{Ave. intake rate Ia}}$ + Advance Time = _____" +
    "/hr.
    _____hrs. = _____hrs.

13. Irrig. frequency = I.F. = $\frac{\text{Depth needed } D_n}{\text{Peak daily use } U_p}$ = _____" = _____ days
    "/day

14. Recommendations: