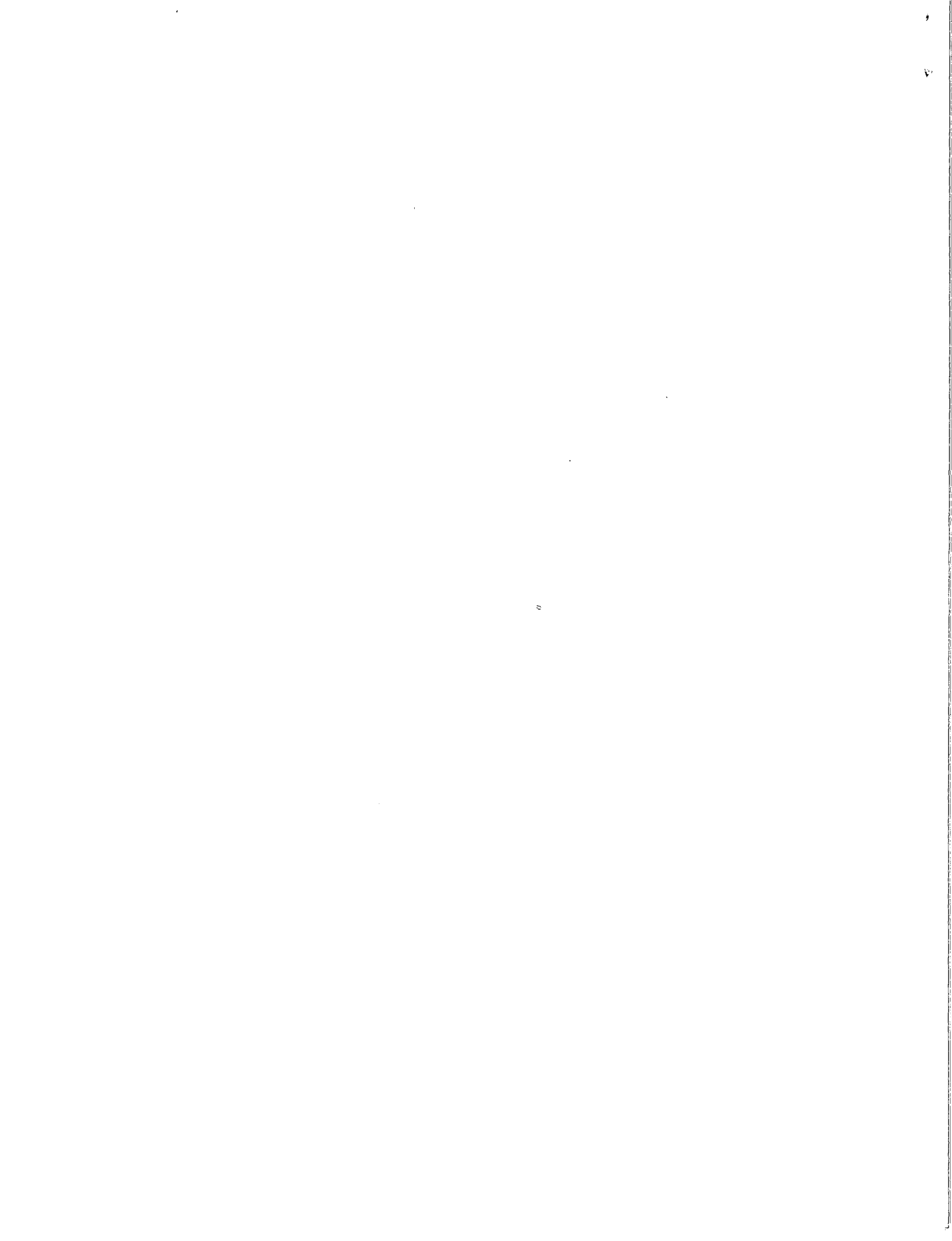


# **Irrigation Training Toolbox Irrigation System Evaluation**

## **Lesson Plan Evaluation of a Fixed (Solid Set) Sprinkler System**

**National Employee Development Center  
Natural Resources Conservation Service  
Fort Worth, Texas  
October 1996**



# IRRIGATION WATER MANAGEMENT

## LESSON PLAN

TITLE: Evaluation of Fixed (Solid Set) Sprinkler System

OBJECTIVE: To provide the participants with the basic knowledge to evaluate the uniformity and efficiency of irrigation by fixed (solid set) sprinkler system.

METHOD: Lecture and demonstration.

INTRODUCTION: The effectiveness of a farmer's irrigation water management practices can be based on the uniformity and efficiency of the irrigation system. The amount of water applied should be sufficient to reach field capacity in the root zone but should not exceed it. The water must be applied uniformly over the field so that each part of the field will have the same opportunity to take in water. The evaluation of a system can measure these values.

### Evaluation of Fixed (Solid Set) Sprinkler System

1. Values to be determined
  - a. DU - Distribution Uniformity
  - b. Eq - Application Efficiency of Low Quarter
  - c. Re - Effective Portion of Applied Water
2. Information Required
  - a. Frequency and duration of normal irrigations
  - b. MAD and SMD
  - c. Nozzle diameter and type for estimating flow rate
  - d. Pressure at nozzle at test location and along laterals throughout the system
  - e. Depth of water caught in catch containers
  - f. Spacing between sprinklers along lateral lines and laterals along mainlines
  - g. Rate of discharge from the tested sprinklers
  - h. Additional data required on form
3. Equipment Needed
  - a. Pressure gauge (0-100 psi) with pitot tube
  - b. Stopwatch
  - c. Catch containers (1 quart size)
  - d. 500 ml graduated cylinder
  - e. 100 foot tape

- f. Soil probe
- g. Manufacturer's sprinkler performance charts
- h. Shovel
- i. Form for recording data
- j. 1 gallon container or larger clearly marked and a 4-foot hose having a diameter appreciably larger than the outside diameter of nozzles
- k. Set of drill bits for checking nozzle wear

4. Field Procedures

- a. Select test location
- b. Locate catch containers
- c. Record MAD and SMD
- d. Record sprinkler specifications
- e. Record rated sprinkler discharge, pressure and design application rate
- f. Measure spacing between sprinklers and laterals
- g. Measure evaporation losses
- h. Measure losses
- i. Check pressure of sprinkler nozzles and measure discharge
- j. Record wind speed and direction
- k. Measure and record depth of water in catch containers
- l. During test check sprinkler pressures at selected locations throughout the system
- m. Complete computations on form

5. Utilization of Field Data

- a. Convert volumes of water caught to rates (iph)
- b. Compute and evaluate DU
- c. Compute and evaluate Eq and Re
- d. Application efficiency
- e. Application rate
- f. Analysis
  - (1) Operational checks
  - (2) System potential
  - (3) Underirrigation
  - (4) Improvements

6. Summary - Questions and Answers

References: Florida Irrigation Guide-SCS