



# Small Scale Solutions for your Farm

## Irrigation Water Management

### Do You Have Problems with:

- Running out of irrigation water when you need it most
- Knowing when to irrigate or needing to know how much to apply
- Sometimes over or under applying water
- Wasting water

### What is Irrigation Water Management?

Irrigation water management is a plan to help you know when, how much, and at what rate to apply irrigation water in an efficient manner.

### Purposes and Benefits of Irrigation Water Management

- Avoiding over or underwatering crops
- Avoiding running out of water at critical times
- Reducing pumping costs by only applying water when it is needed, and in the amounts needed
- Preventing erosion caused by excess irrigation water runoff

To be successful and efficient when using your irrigation system, you must learn how to use available water to meet the needs of your crops. You need to know when to turn the system on, and how long to run the system. If you can do this, you will have mastered Irrigation Water Management.



Irrigation water management.





## Associated Costs

- Cost can vary depending on the instruments and methods used
- The basic tools like a rain gauge, spade and notebook cost less than \$25
- Tensiometers to measure soil moisture cost about \$85 each and require at least two per field
- Gypsum blocks and newer granular matrix type sensors are cheaper but need a \$200-\$300 meter to read them
- Rainfall and water use data can be downloaded from the internet



Tensiometer.

## Know the Efficiency of Your Irrigation System

An efficient irrigation system will apply water evenly across your crop field without wasting water by leaking or applying water so fast it runs off the field without soaking into the soil.

- You can run a test on your irrigation system by putting catch cans out and running the irrigation system for a measured amount of time to calculate your application rate
- NRCS can help you analyze this information to determine the rate and how evenly water is being applied
- NRCS can help you adjust your system to improve the performance

Having a uniform application of water is important so you don't apply too much water in some places and too little in others. This wastes water and will wash fertilizer and other chemicals off your field and may cause pollution of ground and surface water.





## Know When and How Much to Irrigate

There are two ways to schedule your irrigations. One is to measure the amount of water that is in the soil.

- You can learn to judge how much water is available to your crops by feeling a sample of the soil taken from the root zone of your crop
  - NRCS can provide you with training and information on how to do this
- You can use tensiometers, gypsum or other granular matrix, or other inexpensive electronic moisture sensors to measure soil moisture
- Tensiometers work best in sandy soils. Gypsum blocks and granular matrix sensors work better in heavier (higher clay content) soils. Be sure you select the correct tool

The other method is to track the crop's water use and to replace it when needed. This is called the checkbook method.

- You will need a rain gauge near your field. After it rains, record in your note book the date and the inches of rainfall that has occurred
- When you irrigate, write down the inches of water you gave the crop
- NRCS can help you obtain information about how much water your crops use based on the weather
- Soon you will have what looks like a checkbook with deposits of water by rain and irrigation and withdrawals of water by the crop
- NRCS can help you understand when the balance in your notebook signals that irrigation is needed and how long to run your irrigation system



Checking the moisture in soil.







## Know the Capacity of Your Irrigation System

If you know the flow rate of your irrigation system (i.e., gallons per minute or gpm) and the size of your field you can calculate how long to run the system to deliver a set amount of water (i.e., inches of water) to your crops.

- A flow meter is a valuable tool in Irrigation Water Management. It is like a speedometer in a car
- It will tell you how much water is being pumped through your irrigation system
- A pressure gauge is another valuable tool. By checking the pressure near the pump and comparing it to the pressure at the end of the system, you can tell if there are any problems in the system
- NRCS can help you determine what the normal difference in pressures should be. Large differences indicate something is wrong with your irrigation system



Tensiometer.



Flow meter.





## Technical and Financial Help Is Available

Whether you measure your farm in terms of feet or acres, your local Natural Resources Conservation Service (NRCS) office has experienced conservationists that can help you develop a Conservation Plan to conserve, maintain, and restore the natural resources on your land and improve the long-term health of your operation.

There is no charge for our assistance. Simply contact your local office to set up an appointment. You may also be eligible to receive financial assistance. Your NRCS office will explain any programs that are available so you can make the best decision for your operation. All NRCS programs and services are voluntary.

## For More Information

Visit the [Natural Resources Conservation Service](#) or visit [farmers.gov/service-locator](https://farmers.gov/service-locator) to find your local NRCS office. You can also check with your local USDA Service Center, then make an appointment to determine next steps for your conservation goals.

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NRCS conservationist assisting small scale farmer with developing a customized conservation plan.

