

# TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE  
NEW MEXICO

NATURAL RESOURCES CONSERVATION SERVICE  
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## AGRONOMY TECHNICAL NOTE NO. 74

### DROUGHT MANAGEMENT FOR CROPLAND

#### CROPS WATER USE

##### *To Seed or Not to Seed?*

High plains dryland farming relies on rainfall for successful fall seeded crop production. Small grain crops need at least 4 inches of soil moisture to produce the first bushel of grain. Each additional inch of soil moisture can produce an additional 6 bushels of grain. Soil moistures should be measured to determine if summer fallow was effective and there is enough moisture to plant.

Irrigated crops can be planted based on availability of irrigation water. Snow survey reports can be used to determine the amount of water that will be available to irrigation districts which use river water. It is a good idea to have your well(s) tested to determine if the ground water level is declining and to chart the gallons per minute output if you know there will be a shortage of water. A decision must be made whether to plant a crop. If the decision is to not plant, consider using a small grain cover crop to add biomass and protect the field from erosion.

#### CROP SELECTION

##### *Have I selected the most appropriate crops to seed for current moisture and market conditions?*

All crops grown in NM have different water requirements. Season long crop consumptive use values can be compared using the Natural Resource Conservation Service (NRCS) [Irrigation Water Management Jobsheet](#). This job sheet can be found on the web. For example in Deming, NM, cotton uses 27 ac. in. per acre of irrigation and alfalfa uses 45 ac. in. per acre. A careful review of these values and the expected commodity price can guide you in evaluating the amount of water you need throughout the year and the expected economic return that may be realized.

##### *When should I irrigate when water is limited?*

Most crops **must** have adequate soil moisture when the main stem is elongating just before flowering. If sufficient water is unavailable during this period, crop yield will suffer to some degree. After flowering and during the grain fill stage, water levels can be lowered. Many growers over-irrigate at this time instead of actively monitoring soil moisture.

Your local NRCS office can assist growers in determining the best type of monitoring system for their crops, irrigation system, and soils. **Tensiometers** are a device that measures water

tension in the soil. **Watermark (resistance blocks) sensors** measure the soil conductivity. They work in many soil conditions. Soil moisture can be approximated by the feel and appearance of the soil if the evaluator is experienced. (For guidance refer to Ag Tech Note 72.)

## **SYSTEM IMPROVEMENTS**

### ***Have I done all the maintenance needed?***

Consider making a system change. Poorly maintained surface irrigation uses 60% more water than a subsurface drip system. Local NRCS offices can estimate what kind of systems will work and their water savings. NRCS has cost-sharing programs available to make improvements to irrigation systems that are already in place.

**Maintenance is important.** Surface systems need land leveling once every 5 years. Pivots may have missing or worn nozzles. If wells no longer supply the designed water volume then the pivot may need to be re-nozzled. Fix leaky supply ditches, fittings, and pipelines. A leaky ditch can use 10-20% more water.

## **ALTERNATE USES FOR CROPS**

### ***Have I considered alternate uses for my crops?***

When drought hits it can be devastating to crop yields. In some cases, it may not be economically viable to harvest crops for grain or forage for hay. In these situations it is important to consider alternate uses for crops and forage.

Drought-stressed crops may be salvaged as livestock feed, but requires testing the crop for nutritional value and potential harmful substances. Nitrate toxicity and aflatoxins may be a problem in drought years. Depending on test results, feed amounts may need to be adjusted for animal nutrition and safety.

### **Forages**

If forage plants show signs of drought stress, care must be taken in using them for fresh forage due to increased nitrate levels. A better option is to use plants as silage, because the silage fermentation process reduces nitrate levels. In either case, testing is critical for safe feeding as nitrate poisoning can be a problem in drought-stressed crops.

### **Grain**

You may want to consider silaging grain in situations where there is very little hay for winter feed. Corn quality generally is not a concern during drought. Corn kernels may be smaller, but feeding value is not affected to the same degree as for oats and barley. Ear corn however, may be lower in nutritional value due to a higher cob to kernel ratio.

### **Use It as a Cover Crop**

If your crop has no feed value, or using it as livestock feed is not a viable alternative, there may be value in using the crop for cover and organic matter. Surface residue acts as a mulch and reduces soil temperature. It is possible that by the following year you may be able to No-till next year's crop into the standing stubble and avoid the ½ inch water loss that

comes with each pass of a tillage operation. This may save on the energy costs of fuel. Standing stubble also catches snow during the winter (if you are in a snow area) and reduces the amount of soil erosion.

## **Soil Testing**

Proper nutrition is essential for satisfactory crop growth and production. The use of soil tests can help in determining the status of plant available nutrients and in turn develop fertilizer recommendations to achieve optimum crop production. The profit potential for farmers depends on producing enough crop per acre while keeping production costs below the selling price. Efficient application of the proper type and amount of fertilizers is an important part of achieving profitable yields. The local NRCS field office can assist you in determining how best to sample the fields and give advise on where to send soil samples for testing. The local NMSU Extension Office can also offer assistance. NMSU maintains a lab at Las Cruces to assist growers.

During drought, fertilize to meet the expected yield of the selected crop. This rate can be determined through a soil test report or by contacting your local crop specialist. Many times a reduced rate of fertilizer application is in order.

Field scouting is another money saving step that can help minimize the cost of pesticides. In terms of weed control, using early control measures that favor crop competition is the best plan. Scouting for insects and diseases weekly, and more frequently when pests are found, is always a good ideal.

Economic thresholds have been developed for a number of insect pests. Use these values as a guideline for making any decision.

As with any plan, adjustments will be made as weather and prices change throughout the season. Time spent developing a plan will pay dividends at harvest.

## **YEAR-ROUND DROUGHT MANAGEMENT DECISIONS**

### **SOIL MOISTURE MANAGEMENT**

#### ***Am I using appropriate soil moisture management?***

Soil moisture management becomes a major issue for farms suffering from prolonged drought.

Some methods include: Leaving crop residue on fields to increase organic matter, and decrease evaporation from the soil surface. Direct seeding reduces the amount of tillage required and keeps the soil moist and less prone to erosion. There are many long-term advantages to zero-till, especially in a drought situation.

Reduced tillage is a relatively new approach for many farmers. When making the switch to reduced tillage or direct seeding, it is important to consider your methods for crop residue management, especially if there are any changes required to your machinery.

Soil moisture management is a long term commitment. Most no-till systems take at least 5 years to establish. During that time many conditions change in the fields. Weed and insect pest species may change so that the fertilizer rate needs to be adjusted. Soils may be cooler

at seeding time which may delay planting. Surface evaporation rates will be lowered, and over time, organic matter will increase.

Many surface irrigators (furrow and flood) should consider subsurface drip irrigation. An irrigation system change could net 60% savings of water and produce higher crop yields. Deming area producers have experienced 50% increase in some crops.

***Can I turn on my old wells if the irrigation district runs out of water?***

The short answer is maybe. We live in a desert. Shallow wells often contain high concentrations of salts. Any irrigation well should be sampled several times each year for Total Dissolved Solids, expressed as Parts Per Million PPM or EC dS/L. Any well exceeding 2000 ppm or an EC of 3 should be used only if lower concentration water can be blended in.

**CLIMATE AND WEATHER PATTERNS**

***Am I informed of climate and weather patterns in my area?***

Farmers must manage climate variability along with all other sources of risk. Farm managers need to understand the climate and weather patterns specific to the area they farm in order to make sound decisions.

Current weather patterns, including the daily conditions and five-day forecast, can be found for your area on the NMSU Climate at <http://weather.nmsu.edu/>.