

December 2007



## Profitable Agriculture Alternatives Newsletter

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Editor

### Irrigation Water Management During Drought

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Irrigation water management is always an important consideration in crop production and even more so during times of drought. Irrigation water management can be broken down into the following areas: water supply, irrigation equipment, irrigation water management, and crop selection and cultural practices.

#### **WATER SUPPLY**

In situations of drought, water supply is often inadequate. For locations where groundwater is available, growers who have a groundwater source will be better able to withstand drought. Sometimes wells are used to pump into irrigation ponds. Drilling a well is expensive, so growers should assess the success of other local wells. The coastal plain of North Carolina produces higher well yields than the Piedmont and Mountain regions.

#### **IRRIGATION EQUIPMENT**

In general drip irrigation systems are more efficient than sprinkler systems because the water can be applied directly to the plant rather than to the entire field. Drip systems are also not subject to evaporation and drift losses associated with sprinkler systems. Whether a drip system or sprinkler system is used, proper design and maintenance will insure that the uniformity of water application is good. Uniformity of application is es-

pecially important for shallow rooted crops so that all areas receive about the same amount of water, and there is not undo plant stress between irrigations. Uniformity for sprinkler systems should be 75 percent or higher and 85% or higher for drip systems. If these levels are not met, an irrigation specialist should be contacted.

**More information can be found at:**  
Verification of Irrigation System Uniformity  
<http://www.bae.ncsu.edu/programs/extension/evans/irr-cal/ag-553-1.pdf> (sprinkler)  
<http://edis.ifas.ufl.edu/AE094> (drip)

#### **IRRIGATION WATER MANAGEMENT**

As with most systems, an irrigation system is only as good as how it is managed. It is important to know how much water is being applied by the system and how much water can be held within the plant's root zone. Flow meters should be installed to determine the volume of water applied over a given time period. It takes 27,154 gallons of water to apply one inch of water to one acre. It is also important to know how much water can be stored in the soil that the plant can extract. For sandy soils the plant available water holding capacity may be 1 inch or less per foot of soil while for clay loams and clays it may be more than 2 inches per foot.

To determine when to irrigate it is important to know how much moisture is in the soil. If soil moisture is relatively high, irrigation can mean wasted water. There are several instruments to measure soil-moisture including tensiometers and Watermark sensors. These instruments come with some guidance for interpretation as they infer soil moisture from what is called "soil-water tension". There are other more expensive instruments that may be beneficial as they read-out in soil-moisture rather than soil tension. Use of these instruments can help growers decide when to turn on an irrigation system.

#### **CROP SELECTION AND CULTURAL PRACTICES**

When water supply is limited, it may be advantageous to consider drought tolerant crops or to target planting dates that favor times of the year with more dependable rainfall. If deficit irrigation is required, irrigation should be limited outside of the "critical" growth stages of the plant. This is the period when adequate water is needed for yield and quality. The critical periods for several crops are given in: <http://www.ces.ncsu.edu/depts/hort/hil/pdf/hil-33-e.pdf>

Mulching and plasticulture limit moisture loss and may be other ways to get more "crop per drop."

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*Drought management resources can be found at the bottom of this page.*

## N. C. Good Agricultural Practices Certification Assistance Program

NC Department of Agriculture and Consumer Services, Division of Marketing

The North Carolina Department of Agriculture & Consumer Services has developed the Good Agricultural Practices (GAP) Certification Assistance Program. This program will help North Carolina growers with financial support in obtaining a third party audit to verify they are following effective food safety practices.

Food safety has become an important marketing and health issue for the produce industry. Buyers are demanding assurances from growers that their produce is safe. It will become more difficult for growers to market their fruits and vegetables if they don't have a GAP program in place to make sure their produce is free of contamination. The goal of this program is to increase the number of N.C. farmers following Good Agricultural Practices (GAP)/ Good Handling Practices (GHP) and using third party audits to verify their food safety program.

The NCDA&CS program is a cost share program designed to assist fruit and vegetable growers with the cost of a GAP/GHP audit. The NCDA & CS will pay up to \$400 of the cost of having a third party audit to verify a farm's food safety program. Funds will be paid to the auditor conducting the GAP/GHP audit to reduce the cost to the farmer by up to \$400.

Participating farmers will be responsible for paying the auditor for any balance due above \$400. Funding for this program comes from a USDA grant to the NCDA & CS. Funds are available on a first come first served basis until the funds are depleted.

**To be eligible for assistance**, North Carolina fruit and vegetable growers must meet the following requirements:

- Growers must have a third party audit from an approved government agency or company that verifies Good Agricultural Practices/Good Handling Practices.
- GAP/GHP audits can be for Farm Review, Field Harvest and Field Packing Activities, Packing House Facility, Storage and Transportation, and Traceback.
- The GAP/GHP audit must be conducted in 2008.
- Submit an application form for approval to participate in this program to the NCDA&CS prior to receiving the GAP/GHP audit.

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For additional information or to request an application for this program, contact Ross Williams, 919-733-7887 or email [Ross.Williams@ncmail.net](mailto:Ross.Williams@ncmail.net).

Have an idea for a newsletter topic?  
Please send it to Annette Dunlap at the e-mail address below.

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### RESOURCES

Verification of Irrigation System Uniformity

<http://www.bae.ncsu.edu/programs/extension/evans/irr-cal/ag-553-1.pdf> (sprinkler)

<http://edis.ifas.ufl.edu/AE094> (Drip)

Critical Moisture Periods

<http://www.ces.ncsu.edu/depts/hort/hil/pdf/hil-33-e.pdf>