

<http://www.ext.nodak.edu/extnews/spouts/>

water spouts

No. 229

JUNE 2007

Upcoming NDSU Field Days and Other Crop-related Events

Minot – Pulse Crops Day North Central Research Extension Center	July 10	(701) 857-7677
Hettinger Research Extension Center	July 10	(701) 567-4323
Dickinson Research Extension Center	July 11	(701) 483-2348
Williston Research Extension Center	July 12	(701) 774-4315
Outlook, Sask. Canada-Saskatchewan Irrigation Diversification Centre Irrigation Field Day and Trade Show	July 12	(306) 867-5400
Casselton Agronomy Seed Farm	July 16	(701) 347-4743
Carrington Research Extension Center	July 17	(701) 652-2951
Minot North Central Research Extension Center	July 18	(701) 857-7677
Sidney, Mont. USDA/ARS Northern Plains Ag Research Lab	July 18	(406) 482-2208
Langdon Research Extension Center	July 19	(701) 256-2582
Mandan USDA/ARS Northern Great Plains Research Lab	July 19	(701) 663-6445
Kidder County and Oakes Area Tour of Commercial Onion Production and Processing	Aug. 28	(701) 223-8332

Irrigation Field Day and Trade Show in Saskatchewan

An irrigation field day and trade show will be held at the Canada-Saskatchewan Irrigation Diversification Centre (CSIDC) on July 12, 2007. The center is at 901 McKenzie St. S. in Outlook, Sask. The theme of the field day is food and fuel. The trade show starts at 9 a.m., with field tours being offered at 8:45 a.m., 11:30 a.m. and 1:30 p.m. and lunch from noon to 1:30 p.m.

Highlights will include specialty crops, in particular strawberries and potatoes; crop varieties for ethanol production; irrigation systems and water management; organic vegetable production; and fruit orchards. Admission is free. For more information, contact the CSIDC at (306) 867-5400 or www.agr.gc.ca/pfra/csfdc/csfdc.htm.

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The Pressure Gauge and Flow Meter – Important Tools for Irrigation Water Management

Flow meters appear to be equipment that many irrigators don't use, don't repair and constantly overlook when managing their irrigation systems. Through the years, I've conducted pumping plant efficiency tests on many irrigation systems and finding pumping plants where one never was installed or it was installed but is not working is common. That often has been that way for many years. North Dakota winters are hard on flow meters, and the freeze/thaw cycles quickly cause the bearings and other moving parts to wear out. This also is true for the other parts of the irrigation system. Probably now is the time to either repair the old flow meter (if that's possible) or purchase a new flow meter.

An accurate, working flow meter provides very valuable irrigation management information. Accurate flow measurement is important for chemigation,

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selection and modification of sprinkler nozzles, calculating the application rate of the pivot, checking the production of the well and tracking the performance of the pump. However, the most important reason for an accurate flow meter is that it provides how much water was pumped during the growing season.

In the areas of North Dakota that had drought the last few years, many wells had to be valved back because of low pumping water levels. The low pumping water generally are due to seasonal irrigation pumping, but the drought exacerbated the problem. Without a flow meter, irrigators have no way to measure how much water is being applied to the crop. Consequently, many irrigators were not able to apply water to keep up with crop water use unless they were lucky to get a significant rain event.

If your flow meter doesn't work, have it repaired or buy a new meter this irrigation season. If your flow meter is working properly, consider removing it this fall and storing it in a warm place for the winter. Removing the flow meter and covering the hole in the pipe with a piece of tin takes only about 15 minutes. If you take care of your flow meter, it will last a long time and provide accurate information on the performance of your irrigation system.

Pressure gauges

The pressure gauge is an often overlooked and neglected instrument on many irrigation systems. Yet, it is probably the most important indicator of irrigation pump operation readily available to you. Every time you turn the pump on, the pressure gauge receives a "shot" due to pressure fluctuations from filling the pipeline. In addition to the bounce at turn on, while the pump is operating, pressure fluctuations and vibrations often occur. Because of these conditions, pressure gauges (even liquid-filled types) lose their accuracy after a couple of growing seasons.

If your pressure gauges are old and you question their accuracy, now would be a good time to replace them. For center pivot irrigation systems, the one located at the pivot point probably is the most important and should be the first one replaced.

Since a pressure gauge only conveys useful information when you are looking at it, why not install a shut-off valve between the gauge and the pipeline? When you want to check the pressure, just open the valve. This will extend the life of the pressure gauge and ensure you are getting accurate readings. Plus, that makes the pressure gauge easy to remove at the end of the season.

Crop Production Information on the NDSU Extension Web Site

With all the disease and pest problems that plague crop production, finding helpful information sources sometimes is difficult. To help you better manage your crops, NDSU provides a variety of up-to-date information on the Web. Some publications you will find useful:

- W-253, "2007 North Dakota Weed Control Guide"
- PP-622, "2007 North Dakota Field Crop Fungicide Guide"
- A-250, "Soybean Production"
- E-1143, "North Dakota Field Crop Insect Management Guide" for 2007
- A-834, "Basics of Corn Production in North Dakota"

These publications, along with many others, can be found at www.ext.nodak.edu/extpubs

Other published information that could be useful:

2006 Variety Performance Information
www.ag.ndsu.nodak.edu/aginfo/variety/

Row Crops and Oilseeds
www.ag.ndsu.nodak.edu/plantsci/rowcrops/main.htm
(Includes sunflowers, soybeans, canola, corn and dry edible beans)

Small Grains Information
www.ag.ndsu.nodak.edu/aginfo/smgrains/

NDSU Research Extension Centers
www.ag.ndsu.nodak.edu/recenthp.htm

USDA-ND Ag Statistics Service
www.nass.usda.gov/nd

NDSU Extension Biotechnology Info
www.ag.ndsu.nodak.edu/biotech/

NDAWN Weather Information
www.ndawn.ndsu.nodak.edu

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Watch Your Soil Moisture – It Can Change Very Quickly

When describing the growing season so far, the rain appears to have been plentiful all over North Dakota. The recorded rainfall amounts for the last 30 days (May 22 to June 21) from the North Dakota Agricultural Weather Network (NDAWN – <http://ndawn.ndsu.nodak.edu>) show that most places have received 5 inches or more. Watford City has the lowest recorded amount at 2.9 inches, but many locations have received more than 7 inches, and Tappen in Kidder County has a recorded amount of 10.9 inches. Most locations had multiple significant rainfall events, which means much of the rain infiltrated into the soils.

As we enter the critical irrigation months of July and August, most irrigators will be starting with soil moisture levels near field capacity. In addition, the rain should have replenished many of the shallow aquifers that were affected by the drought the past few years.

Check soil moisture

Even with the increased rainfall amounts, the only way to be sure of the level of soil moisture is to check every field and at several locations in the field. When managing water applications with a center pivot, getting behind is very easy if you don't watch your soil moisture levels. Crops are growing quickly and using an increasing amount of water each day.

The best and easiest way to check the soil moisture is with a soil probe, Figure 1. The soil probe should be at least 3 feet long to check the soil moisture down to the 3-foot depth. A typical soil probe is made of stainless steel and removes a soil core about 3/4 inch in diameter. A common soil probe is the Oakfield probe. A one piece, 3-foot soil probe sells for about \$80 (www.soilsamplers.com/). Some fertilizer plants carry 2-foot soil probes to sell to their customers.

Low soil moisture, especially subsoil moisture, can affect the growth and development of deep-rooted crops, such as small grains, corn, sugar beets, sunflower and alfalfa. By using the "feel method," you can estimate the soil moisture level with reasonable accuracy. The feel method involves taking a soil sample, forming a ball in your hand and squeezing. The response of coarse-textured soils to squeezing at field capacity will leave no free water on the soil ball,

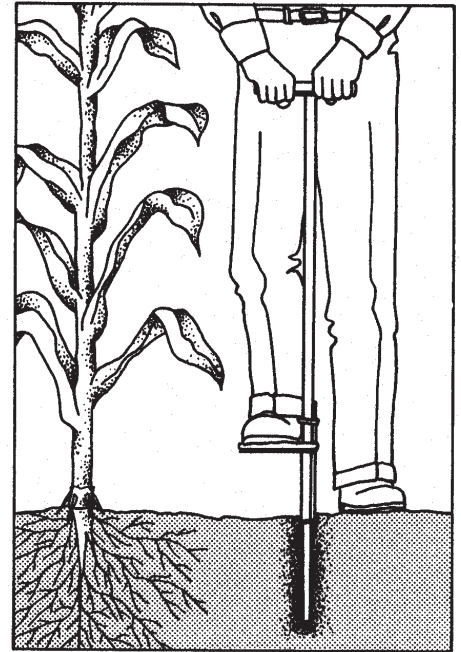


Figure 1.
Checking subsoil
with a soil probe.

but a wet outline of the soil ball will be left on the hand. If the ball of soil breaks easily, then the soil is less than field capacity.

Managing subsoil moisture always is difficult because it involves determining if enough rain has been received to recharge the soil profile before the high water use period begins. Recharging the root zone with irrigation is easy when the crop is young because it is not using much water. Most of the applied water will infiltrate into the soil. This may not be true later in the season, when the crop is taller, more mature and using a greater amount of water. Center pivots with less than 6 gallons per minute of flow capacity per irrigated acre may not be able to keep up with crop demand later in the season. Starting to irrigate early may be wise for irrigators with low-flow capacity irrigation systems.

Scheduling irrigation

With variable rainfall events, determine when to irrigate and how much water to apply can be difficult. A system for scheduling irrigation events must be followed.

Scheduling using the "checkbook" method requires the irrigator to measure rainfall amounts, record irrigation amounts and obtain an estimate of daily crop water use. Using these data, a soil moisture balance sheet is used to determine the daily soil moisture deficit. This method is called the checkbook method because it is

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very similar to how you balance your bank checkbook. If you think of rain and irrigation amounts as deposits and crop water use as withdrawals from the "soil water bank," then you have the idea. The procedure is outlined in NDSU Extension publication AE-792, "Irrigation Scheduling by the Checkbook Method," available from county Extension offices. A computerized version of the checkbook method, which can be used in both North Dakota and Minnesota, is available from my office for \$30.

The most difficult part of scheduling irrigation is obtaining the daily crop water use values. Fortunately, you have two relatively easy ways to obtain these numbers. AE-792 contains tables that provide estimates of the daily crop water use for the most commonly irrigated crops in North Dakota. All you need is a record of the daily maximum temperature and the number of weeks past emergence.

More accurate estimates of daily crop water can be obtained from the NDAWN Web site by looking under "Applications." You can obtain daily crop water use

in numerical tables or maps for alfalfa, turf grass, corn, dry beans, wheat, barley, potatoes, sugar beets, sunflowers and soybeans. The crop water use estimates from the Web site are more accurate than the values in the crop water use tables of AE-792 because local daily weather is used to calculate the crop water use. You can select crop water use tables for any of the 70 NDAWN weather stations and a particular crop or you can view maps of North Dakota with crop water use values superimposed at the location of each weather station.

Knowing crop water use, using the checkbook method and monitoring soil moisture on a regular basis (every two weeks) will help you optimize your irrigation water management and provide the best yield possible.



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