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water spouts

No. 204

JULY 2003

Field Days and Irrigation Tours for 2003

Hettinger Research Extension Center	July 8	(701) 567-4323
Dickinson Research Extension Center	July 9	(701) 483-2348
Williston Research Extension Center	July 10	(701) 774-4315
Fargo/Casselton Weed Tour	July 15	(701) 231-8157
Carrington Research Extension Center <i>Irrigation Research</i>	July 15	(701) 652-2951
Minot North Central Research Extension Center	July 16	(701) 857-7677
Langdon Research Extension Center	July 17	(701) 256-2582
Sidney, Mont. Eastern Ag Research Center	July 23	(406) 482-2208
Tappen I-94, Pettibone exit, north side <i>Irrigated Potato Field Day</i>	July 24	(701) 231-7076
Williston – Ag Open Mon-Dak Irrigation Tours	Aug 6	(800) 735-6959
Oakes Irrigation Research Site	Aug 19	(701) 742-2189

Missouri Slope Irrigation Development Association – Irrigation Tour

The Missouri Slope Irrigation Development Association (MSIDA) will be hosting its annual summer irrigation tour Friday, July 11. The focus of the tour will be on vegetable production. Tour registration will be in the parking lot at Kist Livestock, 1715 40th Ave. S.E. (south side of Memorial Highway) in Mandan between 8 and 8:30 a.m. CDT. The tour schedule is as follows:

8 to 8:30 a.m.	Register and gather at Kist Livestock
8:45 a.m.	Meet at Exit 170 on I-94 (RV Park at Menoken Exit)
10 to 11 a.m.	Dawson Produce (drip and pivot irrigated vegetables)
11 to noon	Whole Peel Onion Plant
Noon	Picnic Lunch in Dawson
1 to 3:30 p.m.	Tappen Area (potato research, feed grains and vegetables)
4 to 5 p.m.	Medina – Dakota Fresh Salad Plant
5:30 p.m.	Henry Becker Farm – approximately 20 miles south of Medina (irrigated alfalfa and grain)
6:30 p.m.	Steak supper at the Henry Becker Farm

The cost of the tour is \$15 or \$10 for just the steak supper. You must provide your own transportation or car pool with someone else. For more information, contact Kevin Nelson (701) 663-3012, Terry Kemmet (701) 327-8285 or any MSIDA regional director.

Irrigation Tour at the Carrington Field Day

Irrigation water management and research have always been part of the mission of the Carrington Research/Extension Center. The irrigation facilities at the center include surface irrigation, three full-size center pivots, a two-tower research pivot and an eight-acre research area devoted to small plot work. The Carrington field day will be held

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July 15 with the irrigation and technology tour starting at 9:30 a.m. Presentations on the tour will deal with:

1. **Optimizing pump energy requirements.**
Energy costs for pumping irrigation water are always increasing. The variable-speed motor controller and cycle-stop valve are new technologies that can help optimize pumping energy.
2. **Misting system design and disease research.**
Crop fungal diseases are always hard to research because nature can't be relied on to consistently provide conditions for their growth. Misting systems that use microsprinklers (technology from the citrus industry) are being used to study diseases on canola, sunflowers and dry beans.
3. **Soil moisture monitoring and irrigation scheduling software.** Effective irrigation water management is dependent on knowing the amount of soil moisture in the root zone. Different types of soil moisture measuring equipment will be demonstrated along with irrigation scheduling software that runs on a Personal Digital Assistant (PDA).
4. **Intensive wheat management.** Wheat is a good rotation crop for irrigation because it helps with soil and disease management. However, economically it generally doesn't pay under irrigation. Research dealing with intensive wheat management under irrigation will be demonstrated.
5. **Pivot control/sprinkler packages.** Computerized center pivot control panels and low-pressure sprinkler package selection will be presented at the two-tower research pivot.
6. **Guidance systems for crop management.**
The use of global position system (GPS) guidance systems by farmers has been increasing rapidly. Light-bar and GPS systems will be demonstrated.

Registration for the field day begins at 9 a.m. with coffee and rolls. All morning tours start at 9:30 am.

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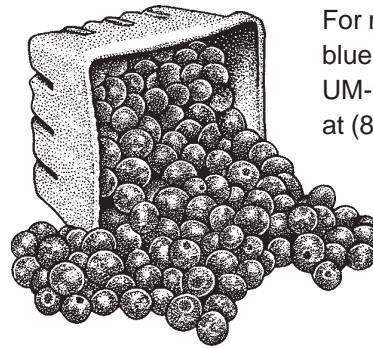
Blueberry Field Night

University of Minnesota horticulture specialists will lead discussions on commercial u-pick blueberry startup steps, organic practices, maintenance practices and marketing tips on Thursday evening, July 17, at the Central Lakes College - Ag Center in Staples, Minn. Discussion will be tailored around the interests of potential and existing commercial growers and Master Gardeners. Practices included in the discussion will be soil pH, fertility, weed control, mulching, organic inputs, pruning, trickle irrigation and marketing.

Registration is free and opens at 5:30 p.m. The field night blueberry clinic will run from 6 p.m. to sunset and take place in the University of Minnesota blueberry planting south of the bus garage. If raining, the horticultural meeting will be held indoors at the Ag Center. Info packets on blueberry production will be available at the clinic for a cost of \$5.

Field night is co-sponsored by the University of Minnesota Extension Service, UM-Central Region Partnership, UM-College of Agricultural, Food and Environmental Sciences and the Central Lakes College - Ag Center.

The Living Legacy Gardens team at the Ag Center is also hosting several backyard landscaping idea sessions between 2 and 8 p.m. July 17 at a cost of \$5. They are also serving a picnic lunch in the gardens at 5 p.m. for a cost of \$5 but you need to preregister to reserve a plate by calling Shirley Judd at (218) 894-5161 or e-mail sjudd@clcmn.edu.



For more information about the blueberry field night, contact the UM-Central Region Partnership at (877) 977-7778.

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Irrigated Potato Field Day

The irrigated potato field day will be held at the irrigation research site three miles east of Tappen from 9 a.m. to noon Thursday, July 24. The research site is located on the north side of I-94 at the Pettibone exit. The field day is sponsored by the Northern Plains Potato Growers Association.

A tour of research and demonstration plots by North Dakota State University (NDSU) experiment station personnel will include variety trials, sugar end trials, weeds and herbicides, disease plots and planting configurations to improve irrigation water management. The field day will be followed by a noon lunch.

Speakers will include Susie Thompson, NDSU potato breeder; George Kegode, NDSU weed research; Harlene Hatterman-Valenti, NDSU high-value crops research; Dean Steele, NDSU irrigation research; Duane Preston, NDSU Extension potato specialist; Marty Glynn, USDA/ARS potato processing research; and Gary Secor and Neil Gudmestad, NDSU plant pathologists. There is no charge and the public is invited. It is anticipated that university, regulatory, grower, industry and agribusiness representatives will attend.

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How Much Rain is Beneficial During the Growing Season?

The rain gauge reads 0.12 from yesterday's sprinkle, you received no rain the day before and you do not expect rain today. Does this amount of rain matter for irrigation scheduling? You may wonder whether you should enter this amount in your irrigation scheduling worksheet. The purpose of this article is to simplify your irrigation scheduling practices by discussing small rainfall events and their impact on the water balance used for irrigation scheduling. Irrigation scheduling is discussed here in the context of using the NDSU Extension Service publication AE-792, *Irrigation Scheduling by the Checkbook Method*. This publication contains a worksheet in which you record rainfall, net irrigation and crop water use. You then compute an estimate of the amount or balance of water available to the crop.

The rainfall that enters the soil is net rainfall. Crop leaves intercept and hold some rainfall, where it evaporates before it enters the soil. Since this rain does not reach the root zone of the crop, it does not contribute to the water balance and you should not enter it on the water balance worksheet.

As the first water droplets hit dry foliage, they splatter. Most of the water drops off, but some sticks to the plant. As droplets hit the foliage, it forms a film. Based on computer modeling and lysimeter studies, Dr. Allen Thompson, agricultural engineer at the University of Missouri, estimates that a fully developed corn crop can hold between 0.05 and 0.10 inches of water on the leaves and stalks. The amount depends on wind speed, air turbulence and other atmospheric conditions. He suggests neglecting rainfall events smaller than 0.10 for irrigation scheduling purposes. This does not mean you should subtract 0.10 from larger rainfall events, because you would gain little accuracy by doing so.

To put this amount in perspective, suppose an irrigation system applies enough water to supply the irrigated area with one inch of water. An efficiency of 85 percent translates into a loss of 0.15 inches. For applications of 0.50 to 0.75 inches, the efficiency may drop to 80 percent, which translates into losses of 0.10 to 0.15. The losses for irrigation systems are larger than the 0.05 to 0.10 inches for rain because, in addition to canopy evaporation, the irrigation losses include losses from drift and from evaporation as water droplets travel through the air.

Other factors influence the contribution of small rainfall events to the soil water balance. Even if the top inch of soil is wet from a small rain, evaporation from the soil surface may make this additional water unavailable to the crop. The rate of evaporation from the soil surface increases when the surface is wet because the ability of water to move through soil increases with the wetness of the soil.

Common experience tells us that rainfall is variable with location, even within a single field. When small amounts are measured in a rain gauge, some areas within a field may have received no rain. Thus you may simply want to neglect amounts less than 0.10 to avoid the risk of under irrigating parts of a field. Another way to address this problem is to install more than one rain gauge in a field.



In summary, rainfall amounts smaller than 0.10 inch can be ignored for irrigation scheduling purposes. These small rainfall amounts do not need to be entered into water balance calculations. We have developed an irrigation scheduling spreadsheet program for Windows 3.1 and Windows 95. Intended for use in North Dakota and Minnesota, it includes historical daily temperature data in the spreadsheet to make it easy to forecast crop water use as much as a week in advance. Contact me for more information if you are interested.

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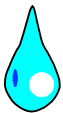
Rainy Weather Can Sometimes Fool You

Throughout this spring and early summer, practically all of North Dakota has been receiving a steady supply of rainfall, which has generally negated the use of irrigation. Some areas have too much water on the ground, which has caused either delayed planting or no planting at all. However, variable rainfall events can fool you into thinking there is enough water in the root zone and delay starting the irrigation system until it's too late.

July and August constitute the high-water-use period for irrigated crops. For average weather conditions, most irrigated crops will use about 0.25 to 0.30 inches of water each day. To determine when to turn on the irrigation system and schedule irrigation, it is important to know how much rain is received at each field and have some estimate of the daily water use of your irrigated crop. To measure rainfall, I recommend having two accurate rain gauges with at least two-inch diameter openings. One should be in the southwest corner of the field and one should be located in the northwest corner. I recommend these locations because during the summer about half the rain comes from the south and half comes from the west.



**There are two easy ways
to obtain daily estimates of crop water use.**



The **first** is to visit your local county office of the NDSU Extension Service and get a copy of AE-792, Irrigation Scheduling by the Checkbook Method.

This publication contains tables that allow you to estimate the daily water use of most crops by knowing the maximum air temperature.

The **second** method involves the Internet. If you have an Internet account and can browse the Web, more accurate estimates of daily crop water use can be found at this Web site:

www.ext.nodak.edu/weather/ndawn/old-ndawn-home.html

The crop water use estimates for the 10 most irrigated crops can be seen on a map showing all 61 weather stations on the North Dakota Agricultural Weather Network (NDAWN) system. Numerical tables with the crop water use estimates can also be obtained for each weather station. In addition to the crop water use maps, a map showing the cumulative rainfall amounts at each weather station and a map showing the rainfall minus the water use of corn are also on the Web site. Even with accurate measurement of rainfall and crop water use, you still need to check the soil moisture in the field periodically during the season. Checking the soil moisture at several sites in a field about every two weeks is a highly recommended practice.

A handwritten signature in black ink that reads "Tom Scherer".

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