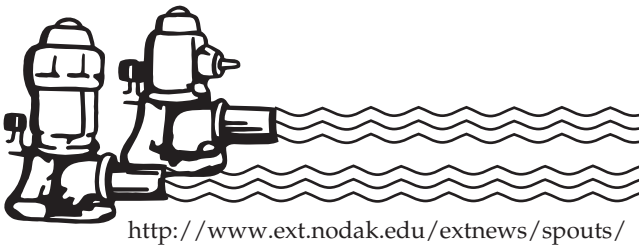

water spouts

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

No. 214 APRIL 2005

The Beginning of a New Irrigation Season

Welcome to the 33rd year we have been delivering irrigation information to you in Water Spouts. As we enter the growing season, remember that the 2004 growing season was not typical. The heat unit accumulations statewide were quite a bit lower than normal. The cool summer temperatures, combined with an early frost in August, hindered the maturity of long-season crops such as corn and soybeans. Throughout the fall, winter and this spring, drying grain has become commonplace on many farms. An article on low-temperature grain drying has been included in this issue to help with grain drying questions.

On the other hand, record yields were obtained in 2004 from cool-season crops such as potatoes and small grains. We hope this year the heat units will be back to "normal."

Mark Your Calendars – 2005 Field Days

• Streeter Central Grasslands Research Extension Center	June 15	(701) 424-3606
• Minot – Canola Tour North Central Research Extension Center	June 30	(701) 857-7677
• Hettinger Research Extension Center	July 12	(701) 567-4323
• Dickinson Research Extension Center	July 13	(701) 483-2348
• Williston Research Extension Center	July 14	(701) 774-4315
• Casselton Agronomy Seed Farm	July 18	(701) 347-4743
• Carrington Research Extension Center	July 19	(701) 652-2951
• Sidney, Mont. Eastern Ag Research Center	July 19	(406) 482-2208
• Minot North Central Research Extension Center	July 20	(701) 857-7677
• Langdon Research Extension Center	July 21	(701) 256-2582

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Irrigated Crop Budgets Updated and Available

Projected budgets for irrigated crops in North Dakota have been updated for the upcoming growing season. The budgets were prepared to be a source of information for producers, lenders and others who need to estimate the costs of growing irrigated crops. Budgets for alfalfa, alfalfa seeding, corn grain, corn silage, dry beans, potatoes, malting barley, soybeans and spring wheat are included in the reports.

The budget reports are available at the NDSU Extension Service's county offices or on the Web at *www.ext.nodak.edu/extpubs/ecguides.htm* .

The budgets for irrigated crops consistently show potatoes as having the most profit potential, followed by alfalfa. Once again, corn, both grain and silage, projects the poorest returns. The budgets were prepared from the landowner's perspective. The land charge is based on average rent for dryland. In addition, land taxes are charged at the average for the region. The investment in irrigation equipment, the well and piping is recaptured, apart from the land.

The ownership cost is handled the same as machinery investment. A 10 percent residual value is assumed, with the balance of the investment depreciated over its full, useful life. Useful life varies by component, but averages about 20 years for the total irrigation system. Straight-line depreciation is used. Interest on average annual investment is charged at 5 percent.

Electricity rates used for irrigation reflect off-peak or controlled electric rates, plus demand and other charges, for all crops except potatoes. The rate used for potatoes is the regular rate, plus demand and other charges. Due to the high value of the potato crop, the potential loss from the unavailability of power when needed more than offsets the

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additional electric power charge. The potato budget also includes a charge for trucking to the processor based on the latest custom rate survey, which shows the rate is 71 cents per hundredweight.

Labor is not included as an expense item. Therefore, the bottom line represents a return to labor and management.

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NDAWN's Enhanced Crop Water Use Application Provides New Features

The Crop Water Use (CWU) application that Tom Scherer, NDSU irrigation specialist, developed in 1995 by has been rewritten to match the new NDAWN Web site style. The new version provides data and information specifically for your crop, and includes many features that were available on the Web site. The new CWU application from NDAWN's home page is at *http://ndawn.ndsu.nodak.edu* . From the left sidebar drop-down menu, choose Applications/Crop Water Use/Tables or Maps.

Tables

The new CWU table request page allows you to obtain crop water use and crop water deficit data specifically for your crop. Choose one or more stations (hold down the control key to choose more than one), choose your crop and enter the emergence date. Then select a time period from several preset choices or enter specific start and end dates. Data are available from years back to 1990.

The resulting data table provides you with daily values of rainfall, reference evapotranspiration (ET), crop water use, crop water deficit and the accumulated values for each variable for the specified time period. Several other table features also are new. You may export these table data in comma-separated (CSV) format for use in a spreadsheet program by clicking the export link at the top of the table. If you prefer metric units, just click the [English/Metric] link also at the top of the table.

The graphing capability perhaps is the most useful new feature. When a table is displayed, click the little green graph symbol in the column heading and the system will plot your data. If you chose more than one station, data for all stations will be displayed on the graph for comparison. Although not yet completed, each column heading will be linked to a detailed explanation of the variable, and a link at the top will provide general information explaining ET and describing how the CWU system works.

Maps

The map portion was designed for those who need a statewide perspective of crop water use or deficit. When you choose Applications/Crop Water Use/Maps from the drop-down menu, the CWU map request form appears. From this form you may choose a map that provides either the total crop water use or total crop water deficit for any listed crop for any time period (even past years). Daily values are calculated and accumulated for each NDAWN station and plotted on colored maps. A minute or more may be required for the map to display due to the many calculations required for all 67 NDAWN stations. In addition, maps of the Jensen-Haise reference potential evapotranspiration also are available. Another neat feature allows you to obtain the daily table data for any station just by clicking on the station location. The data table is displayed almost instantly. It is the same table available through the Application/CropWater Use/Table menu. By using your browser's "back" button, you may check daily data for many different stations quickly.

Other NDAWN Applications and Features

Please check out the other available features, such as the crop development models for barley, canola, corn, potatoes, sugar beets, sunflowers and wheat, as well as the small-grain, potato and sugar beet disease prediction models. We hope you will find all of the new applications and features useful and valuable.

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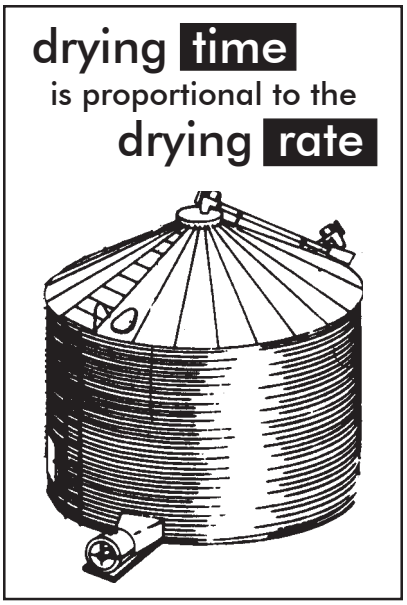
Natural-air and Low-temperature Crop Drying in the Spring

Start natural-air drying corn in early April when air temperatures average at least 40 degrees. This will be when the nighttime temperature is at least in the upper 20s and the daily high temperature is at least in the 50s. The moisture-holding capacity of colder air is limited, so the rate of drying is slow and drying efficiency is poor.

The expected drying time for corn is about 45 to 50 days using an airflow rate of 1 cubic foot per minute per bushel (cfm/bu). Drying time is proportional to the drying rate, so at an airflow rate of 1.25 cfm/bu, the drying time is about 36 to 40 days. Adding heat will change the final corn moisture, but will change the drying speed only slightly.

If temperatures cool to an average of about 30, the fans can be stopped. Wait until the temperature again averages at least 40 before starting the fans. Cool the grain by operating the fans at night or other cool periods before shutting off the fans. This extends the storage life of the grain.



Some people are concerned about shutting fans off because that leaves a drying front in the grain. The drying front simply is the area in the grain mass where the drying is occurring. The dry air comes in contact with wet grain at the bottom of the drying zone, picks up moisture until it comes into equilibrium with the grain in the drying zone, then carries that moisture through the wet grain above the drying zone and out of the bin. Nothing is magical about the drying front or zone. The grain and the drying zone will be in the same condition several days later when the fan is started again.

Fans should be shut off when rain falls for more than a few hours and during fog. Drying is not occurring during these times, so the only benefit from operating the fans is to cool the grain. Some grain rewetting will occur if the fans are running during wet conditions. The fans can be started again when the air is drier.

The average temperature and relative humidity for April in southeastern North Dakota is 42 F and 71 percent. The air will be warmed about 3 degrees as it goes through fans being used for drying corn at a static pressure of about 4 inches. After warming with the fan, the air is 45 F and the relative humidity is 63 percent. This air will dry corn to about 14.3 percent moisture.

The air will be warmed about 5 degrees as it goes through fans being used to dry wheat at a static pressure of about 6 inches. After warming with the fan, the air is 47 F and the relative humidity is 61 percent. This will dry wheat to about 14.4 percent moisture. The estimated time to dry 17 percent moisture wheat using an airflow rate of 0.75 cfm/bu is about 40 days at 47 F.

Operating the fans during the warmer and drier daytime hours will permit drying the wheat to lower moisture content. For example, if the average temperature is 55 F and the average relative humidity is about 55 percent, the wheat will dry to about 13 percent moisture in about 30 days. However, if the warmer and drier air is obtained by operating the fans from 7 a.m. to 9 p.m., then drying the wheat will take about 50 days. Therefore, wait until later in April when temperatures are warmer and the air is drier to dry wheat. Supplemental heat that warms the air 3 to 5 degrees will be needed if the wheat must be dried in early April. Adding heat approximately will double the cost of drying.

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Water Spouts is a Production of the NDSU Irrigation Task Force

Water Spouts is published once per month during the growing season from April to October. The purpose of this newsletter is to provide information to help you better manage irrigation systems and water resources. We try to select topics for each issue that are timely and applicable to that month to address problems or provide information that you can use. The task force is comprised of the following individuals:

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At the end of each Water Spouts article, the author's name, telephone number and e-mail address (if the author has one) are listed. If you have any questions about any article, please contact the author by whatever means is convenient. If you prefer, contact me for help. If you want to look at past issues of Water Spouts, they are available on the Internet at the address shown at the top of this newsletter (under the pumps).

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