NDSU EXTENSION SERVICE

water spouts

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

Field Days and Irrigation Tours for 2003

Williston – Ag Open Mon-Dak Irrigation Tours	Aug. 6	(800) 735-6959
Manitoba Potato Diagnostic School Manitoba Crop Diversification Centre (Carberry site – at junction of Hwys. #1 and #5)	Aug. 13,14	(204) 834-6000
Oakes Irrigation Research Site	Aug. 19	(701) 742-2189

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High-Value Crops Research and Irrigation Field Day at Oakes

A field day will be held Tuesday, Aug. 19, at the Oakes Irrigation Research Site (OIRS). Activities will start at 9 a.m. with coffee and rolls and the field tours will start at 9:30 a.m.

The OIRS is about 4.5 miles south of Oakes on Highway 1. Morning presentations will include:

- Edible dry bean diseases by Luis del Rio, NDSU Extension Service plant pathologist.
- Planned research to control potato early dying and which crops are best to plant the year before potatoes by Richard Greenland, research agronomist.
- Potato weed control by George Kegode, weed biologist.
- Updates on field corn research by Marcelo Carena, corn breeder.
- Planting potatoes in furrows increases yield and quality by Dean Steele, irrigation and environmental engineer.

A noon meal will be sponsored by the Garrison Diversion Conservancy District. An after-lunch presentation on GPS guidance systems will be led by John Nowatzki, water quality specialist. The afternoon session will include:

- Weed control in onion production by Harlene Hatterman-Valenti, NDSU high-value crop production specialist.
- Herbicides and cover crop use for pumpkins and response of sweet corn to Aim and Callisto herbicides by Richard Greenland.
- New and emerging marketing opportunities for vegetables by Maynard Helgaas, area commercial vegetable producer.
- Baby corn production Richard Greenland and Leonard Besemann, research assistant.

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Value-added Opportunities Have Not Disappeared

Agriculture is dynamic and always changing. Value-added opportunities have been around as long as farming has. The ability to further process or market differently has always been available to many types of businesses including agriculture. Seed production is probably one of the oldest added-value ventures in our state and it continues, but the crop mix has changed drastically in the last 10 years. Now the mix includes peas, lentils, canola, edible beans and even vegetable seeds.

North Dakota has lost some value-added businesses in the last five years. The economy appears to be changing nationally with the war efforts and terrorist actions. But all of this does not mean the opportunities have vanished. There are still potential investments for increasing value at the farm gate. The risks have not really changed either. Risk is always present when a new venture of any kind is embraced. With the North Dakota losses and the mindset of the national economy, we might be less willing to take more risk and several people in economic development will agree this has happened.

For agriculture, we should study the situation. We are seeing worldwide production, processing and manufacturing move to areas that have lower costs of inputs and labor. China is now touted as the number one wheat producer in the world. Mexico is not only producing crops but is now building greenhouses for year-round production. Brazil has been shown as a bean producer extraordinaire. California has moved a lot of the irrigated vegetable acres to fruit and nut cultivation because of population encroachment, regulation and cost of production. In North Dakota, we are seeing wineries being built around the state. North Dakota has an excellent entertainment farm in eastern North Dakota and central and western parts of the state are supporting wildlife viewing, bed and breakfast operations and fee hunting.

Added-value ventures in the Midwest have been aided by ethanol demand. Many plants have been built in Minnesota, South Dakota, Iowa, Minnesota, Wisconsin, Kansas, Nebraska and Missouri. North Dakota has several sites that have studied ethanol and one is in process of raising funds for a plant while another has announced intentions to build.

North Dakota has many opportunities in adding value by marketing. Container shipment of identity preserved (IP) products is growing in the United States. Tracing these products basically demands that containers must be secured and records kept along the route. Specific varieties of grain or contracted production of limited, high-value production is on the increase. Organic production is growing about 20-22 percent each year in the U.S. Organic production could benefit from a container facility. North Dakota needs a container facility and probably could benefit from several if placed in strategic locations. There are at least four areas that have been studied.

If you are interested in working on some of these ideas, give your Extension office a call and get the ball started. Many counties have projects started and several are looking for ideas. We also have a leadership development program gearing up for fall meetings in North Dakota. It is called Rural Leadership North Dakota (RLND) and is directed by Marie Hvidsten, Extension rural leadership specialist on the NDSU campus. If you would like to learn more about how projects can be built by good leaders, give Marie a call.

Irrigation and water development have the ability to build high-value cropping and complement added-value projects. Irrigable acres are part of the North Dakota infrastructure that have not been fully utilized. We need to be creative in our added-value plans.

We are seeing more federal dollars spent on peace-keeping strategies, nationwide disasters and terrorism defense. With the budget crunch in mind, one of our senators has been quoted recently as saying “It’s clear to me that the pressure on support for agriculture is going to be intense.” If subsidies were to go down or drop completely, farming in North Dakota would change drastically. We need to be thinking about the future.

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How Late Should You Irrigate?

The last watering of the season can be as important as the first. To ensure optimum yields, adequate soil moisture must be available to crops until they are physiologically mature. Applying excessive irrigation water to the root zone beyond maturity can result in reduced profits. For management decisions on final irrigation, you will need to know the current moisture condition of your soil and the amount available for crop use. Both soil texture and effective root zone will determine the amount of water that can be stored for crop utilization.

Stage of crop maturity and weather conditions will affect the time period when the crop continues to use water prior to maturity. Know the signs and symptoms of physiological maturity in crops you are irrigating. Both the extra savings of eliminating unnecessary irrigation and peace of mind that the crop is safe from frost are worthwhile.

Some crops, such as corn, can endure an increased soil water deficit as the crop nears maturity, while others, such as potato or alfalfa, should continue to be irrigated until harvest, maturity or frost.

Corn should be irrigated until sufficient soil moisture is available to ensure that the milk layer of the kernel moves down to the tip of the kernel or black layer formation (physiological maturity). Physiological maturity is reached about 55 days after 75 percent of the plants have visible silks. The grain moisture may range from 32 to 40 percent at the time, depending on the hybrid. Yellow dent corn is usually fairly well dented at physiological maturity. Once corn is physiologically mature, the dry down rate is approximately 0.5 percent moisture loss per day.

For dry edible bean the last irrigation should be when the first pods are filling, or irrigation stopped when 50 percent of the leaves are yellowing on the plants. When over watered, indeterminate varieties (pinto) may continue to vine and set flower with delayed maturity. For navy bean, physiological maturity is reached when at least 80 percent of the pods show yellowing and are mostly ripe, with 40 percent of the leaves still green in color. Pinto beans are physiologically mature when 80 percent of the pods show yellowing and are mostly ripe and only 30 percent of the leaves are still green. Beans within pods should not show evidence of any green. If the beans have begun to dry, irrigation will not be needed because the beans no longer are removing much water from the soil profile.

Soybean should be irrigated until sufficient moisture is available to allow full bean development and pod fill. This stage is when leaves are yellowing (75-80 percent) and all pods are filled with lower pods just starting to turn brown. At physiological maturity, pods are all yellow and over 65 percent of the lower pods have turned brown. Beans within pods should have little evidence of green color and should be shrinking. Studies show that yellow pods sprinkled with brown are the best clue of physiological maturity. Usually if one or two pods show this symptom on the upper two nodes of the plant, the plant has reached physiological maturity. The soybeans should be tolerant of a killing frost at this time also.

Sunflower should be irrigated until sufficient moisture is available for the sunflower achene's (seeds) to fill. This is when the backs of the heads turn from a lime green to yellow-green color and ray petals are completely dried.

Potato will utilize soil moisture until harvest. Maturation stage begins with canopy senescence as older leaves gradually turn brown and die. Research has shown final irrigation can be used to reduce bruising during the harvesting process. On sandy soils, soil moisture content between 60 to 80 percent of field capacity (40 to 20 percent moisture depletion) provides conditions for a desirable soil load into the harvester with optimum separation of potatoes and soil and a minimum of physical tuber damage. If soil is dry before harvest, a final irrigation should be applied at least one week prior to harvest to raise the soil moisture level and also raise the tuber hydration level.

Alfalfa should be irrigated to maintain active growth until growth is stopped by hard frost. Alfalfa going into the winter with adequate soil moisture has a much better chance of little or no winterkill.

Small grains should be irrigated until adequate soil moisture is available to bring the crop to the hard dough stage.

Sugarbeet will utilize moisture until harvest time. Irrigation is usually terminated seven to 14 days before harvest to allow the soil to dry.

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Crop Water Use in August

July is often perceived as the most critical irrigation month for row crops and alfalfa, but August is probably more important for long-season crops like corn, dry beans, potatoes, sugarbeets and soybeans.

Crops use more water in July than August and the average rainfall amounts are correspondingly greater in July. The average rainfall in July is 2.75 inches in Carrington and 2.35 inches at Oakes, whereas the average rainfall in August for both locations is about 2 inches. This indicates that the irrigation water demand is probably greater in August than in July. Couple this with declining water levels in wells and streams during August and it becomes obvious that irrigation water management becomes very important.

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Average water use for July and August of common irrigated crops is shown on the following table.

Average water use.

	July	August
	inches	
Corn	6.6	6.3
Alfalfa	6.6	6.3
Pinto beans	7.0	5.8
Potatoes	7.0	5.5
Soybeans	6.5	5.9

As crops mature, it is common to cut back on irrigation during the latter part of August. Research has shown that this can be an expensive mistake. Research has shown that corn that was moderately water stressed toward the end of the growing season had an average yield reduction of 13 percent compared to corn that was fully irrigated to maturity.

Crop water use tables published in NDSU Extension Service publication "AE-792, Irrigation Scheduling by the Checkbook Method" show that water use is similar for most full-season crops during August. The following table shows the estimated daily water use based on maximum temperature.

Maximum air temperature	Estimated daily water use for long-season crops in August
50-59 F	0.08 inch
60-69 F	0.13 inch
70-79 F	0.19 inch
80-89 F	0.24 inch
90-99 F	0.29 inch

More site-specific crop water use estimates can be obtained at this Web address:

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

Remember the table above and the values from the Web site give the actual water use by the crop. Applied irrigation water must be greater to compensate for evaporation and drift losses. Research has shown that 85 percent application efficiency is reasonable for North Dakota. This means that almost 0.26 inches per acre must be pumped to get a net 0.22 inches into the soil for the crop to use. Likewise, if you pump 1.18 inches of water per acre only 1 inch will infiltrate into the soil for crop use.

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