NDSU EXTENSION SERVICE

water spouts

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Field Days and Irrigation Tour for 2004

Oakes *Irrigation Research Site*	Aug. 17	(701) 742-2189

2004 Field Day at the Oakes Irrigation Research Site

The annual field day of the Oakes Irrigation Research Site (located four miles south of Oakes on Highway 1) will be held from 9:30 a.m. to 3:30 p.m. Tuesday, Aug. 17.

The morning tour includes updates on field corn research by Marcelo Carena, soybean performance by Ted Helms, and corn and soybean weed control by Richard Zollinger. Mike Liane will give a presentation on new opportunities for irrigators and Richard Greenland will talk about the effect of previous crops on disease development in potato.

Following a lunch provided by the Garrison Diversion Conservancy District, Vern Hofman will give a demonstration of onsite wastewater treatment (septic) systems.

In the afternoon, presentations will be given on sweet corn hybrids for North Dakota, edible pumpkin seed production, weed control in cabbage, and intercropping clovers and vetch with vegetables. Greenland will discuss and demonstrate intercropping of clovers and vetch, including research he did in Argentina this past winter. Clover and vetch can help improve and protect soils, and may serve as forage after vegetables are harvested. If not managed correctly, they may also become weeds and reduce vegetable yields and quality.

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Managing Center Pivot Wheel Tracks

Every irrigator with a center pivot knows that the wheel tracks under each tower can turn into ruts in some parts of the fields. Deep wheel tracks can cause significant damage to the center pivot as well as to tillage and harvesting equipment. Deep wheel tracks are generally caused by saturated conditions that reduce the weight-bearing capacity of soil. The deepest wheel tracks are usually found where water collects in low spots or under the first and second towers from the pivot point. If you have deep wheel tracks at several locations in the field, now is the time to mark where they are located and start making plans to correct the problem.

Major factors that affect the depth of pivot wheel tracks are:

1. The soil type. Usually locations with heavier soils (clay and clay loams) have deeper tracks because they remain wet longer due to higher water-holding capacity and slower drainage. Deep wheel tracks commonly form in low spots where water accumulates. Often the wheel track acts like a drainage canal where rain and irrigation water run down the wheel track to the low spot.
2. The number of revolutions the pivot makes in the tracks before tillage levels the tracks.
3. The weight supported by each tower. Short spans between towers (130 to 170 feet) have less weight than long spans (180 to 200 feet).
4. The amount of wheel contact area with the soil surface.

You can reduce deep wheel track problems using either management or mechanical solutions. Some of the **management** methods you might use are:

1. Schedule irrigation water applications to avoid unnecessary pivot revolutions.
2. Allow the soil surface to dry between irrigation events, especially the soil in the wheel tracks. Sometimes this option is not feasible after a full crop canopy develops and shades the wheel tracks.
3. Keep tire inflation pressures at the manufacturer's recommended level. This will maintain the proper amount of tire contact area.
4. If you have deep wheel tracks in a perennial crop such as alfalfa, consider cutting and harvesting within the circles. If you have deep wheel tracks in only the low areas of your field, consider filling the bottom of the wheel tracks with crushed rock (one to three inches in diameter). This will provide more load support for the towers.
5. During the season, observe the pivot while it operates. If excessive ponding occurs where the deep wheel tracks are formed, you have to reduce the amount of applied water to that location.

Here are some of the **mechanical** changes you can do to help your pivot system reduce deep wheel tracks:

1. Build a road for the tower wheels. This can be done by running the system to mark the wheel track location then using a plow, disc plow or blade to build a ridge where the track is located. Be sure to pull soil from both sides of the track.
2. Manufacturers of pivot systems offer a wide range of tire sizes designed to minimize deep wheel tracks. However, if you go to larger tires, you may have to increase the size and strength of the drive mechanism.
3. Put directional sprinklers on either side of a tower. This directs water away from the wheel track. Some growers are using extra long drop tubes on the two sprinkler locations on either side of a tower. The drop tube drags a weighted, directional sprinkler head that sprays water behind the wheels, thus keeping the wheel track dry.
4. Attach track-closing disks to each tower. A disk located on each side of the track pushes soil into the track as the tower moves through the field. A problem with using this option is the pivot can only be moved in one direction.
5. The sprinklers near the tower can be located on "boom backs." The boom back allows the sprinkler to apply water to the soil behind the wheel so that the track is dry when the tower passes. As in the previous suggestion, the pivot can only be moved in one direction.

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Collaboration on Identity Preserved Conference

"Building Relationships in the World"

The Midwest Shippers Association *(www.mnshippers.org/)* has assembled a task force to build education for the identity preservation (IP) potential in marketing Midwest agricultural products. The Shippers Association envisions a major portion of farm production being locked in containers on the farm and contracted to specialty processors or ingredient companies. The NDSU Extension Service also includes those who believe that IP will increase rapidly.

Consumers are asking about their food sources. Country-of-origin labeling has been in discussion for some time in the United States. The recent Mad Cow incident has fueled discussion on the need for traceability of food products coming to consumers. The federal government has food safety high on its list of needs due to the threat of terrorism. European countries have moved toward traceability and identity preservation as well. McDonald's USA has just announced that it will be 10 percent IP by the end of the year on its meat products and will eventually approach 100 percent IP in the future.

The Midwest Shippers Association has asked NDSU and the Extension Service to be a part of the task force that will organize a major five-state, two-day educational program. The program will be held in Minneapolis, Minn., Sept. 8-10, 2004.

We have taken on part of the role to include North Dakota in the mix of five states. The committee has worked hard to bring education to processors, agricultural producers and potential markets looking for IP products. Videos will be made available to Extension offices and groups interested in the conference. Foreign and domestic markets will be discussed at the conference. Quality and uniformity will be topics of discussion as well. This is the first time a conference of this type has been held in the Midwest.

Product identity preservation will serve producers as an added-value concept for marketing. Education is needed to connect markets, simplify contracting and ship containers. The synergy brought forward by the Shippers Association, Northern Crops Institute, Department of Agriculture (both Minnesota and North Dakota), several commodity associations, NDSU and media coordination has been fantastic. As of this printing, the conference has attracted more than 15 foreign buyers, brokers and processors in the registration. For further information on the location and updated programs, you can go to the conference Web site at *www.grainconference.com* .

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Does Your Flow Meter Work?

Flow meters appear to be equipment that many irrigators don't use, don't repair and constantly overlook when managing their irrigation systems. Over the years, I've conducted pumping plant efficiency tests on many irrigation systems and it is common to find the flow meter doesn't work. Often it 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 is also true for other parts of the irrigations system.

Sprinklers on center pivots are also subject to degradation over time. Recently, the U.S. Department of Agriculture Natural Resource Conservation Service (NRCS), through its Environmental Quality Incentive Program (EQIP), began cost sharing conversion of center pivots to low pressure. Consequently, I have received calls from irrigators who want to check the flow rate to their center pivots so they can take advantage of the EQIP program. Most of these systems have a flow meter, but it stopped working years ago. It is probably 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 management information. Accurate flow measurement is important for proper chemigation, selection and modification of sprinkler nozzles, calculation of the application rate of the pivot, checking the production of the well and tracking the performance of the pump.

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

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Pressure Gauges Are Important

The pressure gauge is an often overlooked and neglected instrument on many irrigation systems. Yet, it is probably the most important indicator of proper irrigation system 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, there are often pressure fluctuations and vibrations while the pump is operating. 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 is probably 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 shutoff 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, it makes it easy to replace the pressure gauge when the system is in operation.

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