www.ag.ndsu.edu/extension-aben/irrigation/water-spouts

water spouts

No. 298 June 2018

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Upcoming 2018 NDSU Field Days and Tours

Streeter – Central Grasslands REC	July 9	701-424-3606
Hettinger REC	July 10	701-567-4323
Dickinson REC	July 11	701-483-2348
Williston REC	July 11	701-774-4315
Nesson Valley Irrigation Research Site	July 12	701-774-4315
Casselton (Agronomy Seed Farm)	July 16	701-347-4743
Carrington REC	July 17	701-652-2951
North Central REC (Minot)	July 18	701-857-7679
Langdon REC (8 a.m. to noon)	July 19	701-256-2582
Oakes Irrigation Research Site	Aug 14	701-742-2744

Nesson Valley Irrigation Research Site Field Day July 12

The irrigation field day will be held at the Nesson Valley Research and Development Farm 23 miles east of Williston on North Dakota Highway 1804. The field day is also a stop on the North Dakota Irrigation Association tour.

Refreshments will be served starting at 8:30 a.m., and the tour will begin at 9 a.m. NDSU research and Extension specialists will present highlights from experiments conducted at the Nesson Valley site.

Topics are:

- Irrigated variety trial research and information
- High-tunnel research update
- Spring wheat breeding program
- Soil health in irrigated systems
- Intercropping in irrigated production
- Western tree trial update for the MonDak region
- Soil moisture monitoring
- Emerging weed issues

The irrigation field day will conclude with a noon luncheon sponsored by area businesses.

Individuals with disabilities may request reasonable accommodations to participate in NDSU-sponsored programs and events. To request accommodations, contact the Williston Research Extension Center by July 8.

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Project Safe Send – Disposal of Pesticides

Project Safe Send is a program that accepts old, unusable or banned pesticides, including herbicides, insecticides, rodenticides and fungicides.

The collected pesticides are shipped out of state for incineration. Project Safe Send is funded through product registration fees paid by pesticide manufacturers.

Check your storage areas for any unusable pesticides. If the containers are deteriorating or leaking, pack them in larger containers with absorbent materials. Free heavy-duty plastic bags are available from the North Dakota Department of Agriculture if needed.

People with more than 1,000 pounds of pesticides should preregister one week prior to delivery. No other preregistration is required. A maximum of 20,000 pounds of pesticides per participant will be accepted. Pesticide rinse water and empty containers no longer are accepted.

The collections will run from 8 a.m. to noon local time at the North Dakota Department of Transportation facilities in the following cities:

July 10	Lisbon	12999 Highway 27
July 11	Valley City	1524 8th Ave. S.W.
July 12	Ashley	520 7th St. S.W.
July 13	Bismarck	218 S. Airport Rd
July 16	Dickinson	1700 3rd Ave. W., Suite 101
July 17	Tioga	425 2nd St. S.E.
July 18	Minot	1305 Highway 2 Bypass E.
July 19	Beulah	205 Highway 49 S.
July 24	Rugby	603 1st St. N.E.
July 25	Devils Lake	1905 Schwan Ave. N.W.
July 26	Adams	804 1st Ave.
July 27	Larimore	1524 Towner Ave.

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Center Pivot Electrical Safety

(Excerpts from a paper presented by Thomas Marek and Dana Porter of Texas A&M University at the 2018 Central Plain Irrigation Conference held Feb. 20-21 in Colby, Kan. The complete paper is available at www.ksre.k-state.edu/irrigate/oow/cpiadocs.html)

Center pivot irrigation equipment manufacturers have done an excellent job of developing operationally versatile irrigation machines, most of which are installed correctly by qualified dealers/installers.

The vast majority of center pivot systems in use today are powered by electricity, supplied entirely from an electrical grid or from on-site power generation sources. However, the maintenance of electrically powered machines has an inherent safety concern since most operate on three-phase, 440-volt (or higher) power. The use of three-phase high voltage provides added benefits of smaller wire sizing along the long lateral run and increased motor efficiency.

However, the use of higher voltages presents added safety concerns for operators. Moreover, the safety requirements for such systems are often not adequately understood by owners/operators, which prevents adequate inspection/maintenance to ensure safety and performance. Safety regarding these high-voltage systems is far too often taken for granted, and the consequences result in both injuries and fatalities.

Review studies of center-pivot systems indicate that electrical hazards due to improper wiring or inadequate grounding are common. A survey of electrically driven center pivot systems with electric pump motors showed "37% were potentially hazardous because of the lack of a grounding conductor, and nearly 40% did not have a grounding rod installed. More than 50% lacked a fuse or a means of disconnection. Other hazardous situations were found, including loose connections, improper circuit and motor protection, and deteriorated insulation."

Inspections by a Nebraska state electrical inspector reported similar results. "Of 77 systems inspected at the owner's request, 10 were classified as lethal, 38 were definitely hazardous and the remaining 29 were potentially hazardous. The 10 lethal systems had current flowing to ground at the time of the inspection or had almost killed someone shortly before the inspection."

Injuries and deaths have occurred as a result of electrical, mechanical and chemical hazards associated with center pivots. In 2011, a widely publicized fatal incident described how two 14-year old girls were electrocuted while detasseling corn. It was reported that the girls either came in contact with the center pivot equipment or received the shock through a pond of water in which the irrigation system was parked. Not unlike other agricultural accidents, others were injured trying to rescue the stricken workers.

There is no higher priority than high-voltage electrical safety. For the benefit of users, there are simply "no second chances" with three-phase, 440-VAC (volts of alternating current) or even 240-VAC line "shorts" should good circuit contact be made. You cannot pull away as with single-phase 120 VAC connection. Three-phase electricity has too great a potential and you will stick to the contact due to the voltage level. When working around the center pivot, if there are any safety doubts with the three-phase system, simply do not chance it.

Grounding for a center pivot unit is typically located at the pivot point pad and achieved with an 8- to 10-foot-long copper-clad grounding rod attached to a No. 6 bare, solid copper wire attached to the pivot point tower leg and/or the grounding lug in the pivot control panel. This is considered acceptable grounding practice for most installations and all is generally well initially.

The longer-term issue occurs over time where: 1) the grounding lug screw becomes loose on the grounding rod connection or 2) the bare cooper wire reacts with the environment in many locations and the wire begins to degrade and does not make a firm connection. Lightning strikes at or near a pump or center pivot can also cause grounding failure.

Owners and operators of center pivot systems should seriously consider and implement regular inspections of their equipment. Accidents, surveys and the risks of serious injury or death to farm workers (often including farm children), warrant appropriate inspections on a routine basis. Farmers are busy, but inspections to prevent/reduce hazards are much preferred over accident investigations.

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Dana Porter, *d-porter@tamu.edu*
Texas A&M Agrilife Research

A Video on Center Pivot Sprinkler Uniformity

The sprinklers on a center pivot are the most important part of the irrigation system, but they sometimes are the least understood by irrigators.

The set of sprinklers on a pivot is called the sprinkler package. A quarter-section center pivot often will have more than 100 sprinkler heads. As you move farther from the pivot point, the area irrigated increases for each sprinkler; thus, the diameter of the nozzle in each sprinkler becomes larger.

Many different sprinkler head designs are available. Some have moving parts, such as impact sprinklers, and some have no moving parts, such as spray heads. However, all have one thing in common: They have a nozzle.

Through the years, the nozzle can become worn due to particulates in the water or age. Also, the nozzle can become partially plugged due to corrosion or the sprinkler head can become damaged.

Many sprinkler packages on center pivots have pressure regulators for each sprinkler head. This is another item that can develop leaks or become plugged.

A properly designed and installed sprinkler package will apply water uniformly across the entire length of the pivot. If you have installed a variable-rate sprinkler package, uniformity becomes even more important.

Each growing season, the possibility of worn or plugged nozzles, poorly working pressure regulators, damaged sprinkler heads or leaks increases. These will affect the water application uniformity. Therefore, if your sprinkler package has been in place more than five years, now is the time to check the water application uniformity.

NDSU Extension has created a video to show you how a typical sprinkler uniformity test is conducted for a center pivot sprinkler system. The NDSU video will be at or near the top of the list.

The video can be found on YouTube through a search for "NDSU Extension YouTube sprinkler."

In addition, I have copies of the video on DVD. If you want a copy, send me an email or a note by regular mail with your name and mailing address.

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North Dakota Water Education Foundation – Summer Water Tours

Clean water is important for the development of North Dakota, and the best way to learn about water projects is to see them in person via a tour.

These tours provide a firsthand look at North Dakota's critical water issues. Registration is $20 per person and includes tour transportation, meals, refreshments, informational materials and a one-year subscription to *North Dakota Water* magazine.

Tours offered are:

- Missouri River Expedition – June 27
- Water and Oil Development Tour – July 11
- **Nesson Valley Irrigation Tour** – July 12
- Fargo-Moorhead Flood and Water Management Tour – Aug. 1
- Missouri River Development Tour – Aug. 17

For more information about each tour and to register, go to *www.ndwater.com/programs* and click on "Summer Water Tours" on the left-hand menu or send a check to NDWEF, PO Box 2254, Bismarck, ND 58502. Please indicate which tour or tours you want to attend and include the number of people. For more information, give us a call or send an email.

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