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## water spouts

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### Field Days and Irrigation Tours for 2002

#### Tappen Area

Irrigated Potato Field Day      Aug 6    9 a.m.      (701) 231-7076  
 I-94, Pettibone Exit  
 North side of freeway

#### Williston

Mon-Dak Ag Field Tours      Aug 7    9 a.m.      (701) 572-8880  
 Irrigation Demo Fields

#### Oakes

Irrigation Research Site      Aug. 20    9 a.m.      (701) 742-2189



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management. The field day will be followed by a noon lunch courtesy of AVIKO.

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; 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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### Plan to Attend the Third Irrigated Potato Field Day

The third annual potato field day will be held at the new irrigated potato research site three miles east of Tappen on Tuesday, August 6 from 9 a.m. until noon. 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 NDSU experiment station personnel will include variety trials, sugar end trials, weeds and herbicides, disease plots, and planting configurations to improve irrigation water

### MonDak Ag Open

The fifth Annual MonDak Ag Open will be held in Williston Aug. 6-8. The three-day event showcases and promotes the MonDak area as an excellent growing region, and as a great place for new agricultural businesses and agricultural development. In addition, organizers plan to highlight the irrigation potential found in the MonDak region.

The Ag Open begins on Aug. 6 with registration. On Aug. 7, guests have the opportunity to participate in one of four tours showcasing various aspects of

the region. Visitors who take the north tour will visit irrigated potato production and research at 29-mile corner, listen to a speaker discuss pulse crop production, and tour Superior Grains and the Bushel 42 Pasta Plant in Crosby.

The east tour will visit irrigated potato research and production at the Nesson Valley, tour the site of the Parshall dairy, hear about growing hydroponic lettuce and local irrigation development. They will then visit Tioga to view the alfalfa cubing plant location, and the new honey processing facility and hear a discussion on wind energy potential.

The south tour will provide a windshield tour of the Elk/Charbon Irrigation District. The guests will visit the onion production site in Cartwright, visit a pumpkin patch near Fairview, and visit MDU, Holly Sugar, the Eastern Ag Research Center and the USDA/ARS Research Center in Sidney.

The west tour will include irrigated potato production research at 29-mile corner north of Williston and a visit to Dagmar, Mont., to observe onion acreage. After a short stop at the Sprole Irrigation Project near Fort Peck, there will be a panel discussion on irrigation development along the Missouri River. Participants will learn about the Dry Prairie Rural Water Project in northeast Montana and finish the tour with a visit to Montola Growers Specialty Oilseeds crushing plant in Culbertson.

Thursday, August 8, guests have the opportunity to either fish or golf. This day provides a way for guests to talk and visit on an individual basis with local researchers, growers, and other agricultural people. To register please call 701-577-8110 or check out the website <http://ag-open.com>.

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## **Learn about Commercial Vegetable Production at the Oakes Field Day**

The Oakes Irrigation Research Site will have its annual field day on Tuesday, Aug. 20 from 9 a.m. to 3:30 p.m. Morning presentations will be on field crops and potatoes. The afternoon program will focus on vegetable production.

### **Morning session**

Did you know that soybean is now grown on more acres in North Dakota than any other crop except spring wheat? Duane Berglund will discuss soybean varieties and production practices.

Potato production is expanding in North Dakota, yet there is limited information on which crops are best to plant in rotation with potato. Richard Greenland will discuss a study evaluating the response of potato planted the year following each of 10 crops.

Traditionally, potatoes have been planted in hills. On heavy soils this practice helps avoid seed piece decay and has other advantages, but it also causes inefficient use of irrigation water and fertilizer. This can lead to ground water contamination. Dean Steele will discuss planting potatoes in furrows on light, well-drained soils to improve water and fertilizer use efficiency as well as increase the yield and quality of potatoes.

Luis Del Rio and Pat Gross will discuss new treatments being evaluated to control white mold in edible beans.

A new sprinkler package has been installed on the linear move system at the Oakes Irrigation Research Site. Tom Scherer will discuss the advantages of the new package and answer questions about irrigation.

A noon lunch will be sponsored by the Garrison Diversion Conservancy District. Then Vern Hofman will present information on biodiesel. Could it replace regular diesel fuel? What are the costs? What are the advantages and disadvantages?

### **Afternoon session**

Those new to onion production or needing some pointers on onion harvesting, processing, and marketing will find the answers in Norman Haak's presentation on onions. Richard Greenland will talk about how to control weeds in onions.

Plant establishment for cabbage productions is very important. Should you direct seed your cabbage or is it better to transplant? If you transplant, is it better to use bare root transplants or plug transplants? We'll look at cabbage planted all three ways and talk about advantages and disadvantages of each.

Do you like salsa? Do you know how to make it? Eugene Elhard and Jodi Bruns will show you how and give you a taste.

Pumpkins are planted in wide rows, leaving a lot of open ground subject to erosion and for weeds to grow in.

Richard Greenland will explain possible ways to incorporate cover crops and living mulches into pumpkin production to reduce weed growth and increase soil organic matter.

Many other studies are labeled so you can compare vegetable varieties and weed control treatments. These plots can also be viewed on days other than field day.

Please let us know if you would like to visit the Oakes Irrigation Research Site on another day. The Oakes Irrigation Research Site is located 4 miles south of Oakes, ND on the west side of Hwy 1.

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## Introducing Microirrigation

The term “microirrigation” describes a family of irrigation systems that apply water through emission devices at low flow rates. Microirrigation is used extensively in orchards, vineyards, gardens, mulch crops and greenhouses. It is even being used more and more with traditional agricultural row crops such as corn and cotton. In landscape designs, microirrigation systems are widely used to water flowers, ground cover plants, shrubs and trees.

The actual application of water in a microirrigation system is through an emitter. The emitter is a metering device that delivers a small but precise discharge. Emission devices deliver water in three different modes: drip, micro-sprinkler and bubbler. In the **drip mode** water is discharged in droplets or in trickles. Water is sprinkled, sprayed, and misted in the **micro-sprinkler mode**. In the **bubbler mode** water ‘bubbles out’ from the emitters. Emitters come in many shapes and sizes depending on the rated pressure and discharge.

### Drip mode

Depending on how the emitters are placed in the distribution line there are two types of drip mode: line source and point source. The line source type emitters are placed either internally or externally in the line with equally spaced holes or slits. The line source type is available in two variations: thin wall drip line commonly known as “drip tape” and thick walled “drip hose.” Both have internal emitters molded or glued to the distribution line. Water applied from the equally spaced holes usually forms a continuous wetting pattern.

The point source type emitters are attached externally to the distribution line. They can be attached at any desired interval along the line. Generally, the point source emitters are installed in the field but factory installed point source systems are becoming available. Water discharged from a point source emitter usually forms a round wetting spot.

### Bubbler mode

The bubbler mode is a higher volume microirrigation system. Water from the bubbler head typically runs down or spreads a few inches in an umbrella pattern from the emission device. Depending on the discharge rate of the bubbler emitter, it can wet a round circular spot or a fill a contained space.

### Micro-sprinkler mode

Micro-sprinklers are emitters that operate by throwing water through the air, usually in predetermined patterns. Depending on the throw-pattern, micro-sprinklers are referred to as microsprays, minisprays, misters, jets or spinners. Micro-sprinklers are desirable in many situations because fewer of these devices are required to cover densely planted areas.

### Applications

#### *Row crops*

Line source drip systems have long been the predominant microirrigation mode for row crops such as pineapples, squash and tomato, and non-traditional crops such as lettuce, peppers, melons and asparagus. The more durable subsurface drip line and above ground retrievable hose are now prevalent. Good land grading is important to even out the low and high spots in the field to correctly install line source drip systems.

#### *Fruits and berries*

Small fruits like strawberries, blueberries, blackberries and raspberries respond well to microirrigation with better growth and production quality. Line source emitters suit closely spaced small berries like strawberries. In vineyards, the predominant drip system employed is the point source mode. With larger trees like apples, oranges, grapefruit, plums, peaches, selecting the right mode is critical.

#### *Crops under cover*

In the northern U.S., most crops will respond favorably to some protection from the cold and frost conditions. Mulch, low and high tunnels, floating mulch, and regular greenhouses are the various coverings used for protection. Mulches cover the soil and cool it while minimizing evaporation, reducing weed growth

and slowing erosion. The free-draining non-soil mixes widely used in greenhouses and nurseries require frequent watering. Manual watering is time consuming, expensive and may not be practical in large operations. Each of the different microirrigation modes has niche advantages. For example, the drip line or hose is preferred in low and high tunnels, and under floating mulch and row covers. The point source emitters and micro-sprinklers are better suited in greenhouses where frequent water application is desirable.

#### *Gardens*

The variety of plants that can be grown in gardens is limitless. Vegetables, edible greens and herbs can be grown in raised beds or under covers. In a home garden situation, having a reliable and a flexible watering system is a very important consideration. Many homeowners prefer to use different watering strategies to avoid the use of chemicals for tackling weeds, pests, fungus and mildew growth. The different flow rates and emitter spacing available from the different watering modes can provide the flexibility to match the plant water needs.

#### *Landscapes*

With better-planned and well-kept landscapes, it is possible to ensure seasonal bursts of color or enjoy a year-around exhibit of colors. The selection of the microirrigation mode is important in any residential, commercial or recreational spaces. The size and shape of the root zone of most landscape plants determines the extent of soil wetting requirement. Most acclimatized plants such as shelterbelts, evergreens and hedges require water only during establishment. Generally, a combination of drip, micro-sprinkler, and bubbler systems should be considered to make the best use of space and costs. Grouping plants with similar water needs together in zones makes a good design and conservative watering strategy possible.

If you are a farmer, a rancher, a homeowner, a gardening enthusiast, a researcher, or a greenhouse operator and would like to explore the many uses of microirrigation, please contact me.

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