



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

## water spouts

No. 187

APRIL 2001

### Greetings

As the NDSU Irrigation Task Force begins the 29th year of preparing this irrigation newsletter, many new challenges are being presented. Irrigation is accepted as an important contribution to economic development, value added agriculture and revitalization of our farming communities. A report on the economic impact of the AVIKO potato processing plant in Jamestown was just published. Almost all of the potatoes delivered to the plant are irrigated. The report shows that this plant alone increases annual business activity by \$148 million.

Last November, the first NDSU Irrigation Research Summit was held. The purpose of the summit was to improve communication about irrigation and to identify and prioritize irrigation research needs that support the irrigation development needs of the state.

Results of the summit pointed to a need to improve the existing irrigation research sites and establish additional sites in the state. Several important research topics were identified. Several methods were proposed to identify future irrigation research needs and develop methods for prioritizing irrigation research topics. Last, methods of enhancing communication of irrigation research needs were discussed and proposed. This newsletter has been a major instrument of communication over the last 29 years. Later this year we will be including a survey with this newsletter to obtain your views on irrigation research and communication needs. Look for it in the coming months.

The NDSU Irrigation Task Force of which I am chairman selects the topics for articles in *Water Spouts*. We try to select topics to help better manage your irrigation systems. The Task Force comprises the following individuals:

Tom Scherer, Extension Agricultural Engineer  
Aung Hla, Extension Area Irrigation Specialist  
Duane Berglund, Extension Agronomist  
Bob Henson, Assistant Agronomist, Carrington R/E Center  
Blaine Schatz, Director, Carrington R/E Center

Paul Hendrickson, Research Specialist – Irrigation,  
Carrington R/E Center

Harlene Hatterman-Valenti, Assistant Professor,  
Plant Sciences

Gary Secor, Professor, Plant Pathology

Richard Greenland, Supervisor, Oakes Irrigation  
Research Site

Dean Steele, Assistant Professor, Agricultural and  
Biosystems Engineering

Dave Kirkpatrick, Research Specialist, Agricultural and  
Biosystems Engineering

Dwight Aakre, Extension Agricultural Economist

Dave Franzen, Extension Soils Specialist

Bruce Seelig, Extension Water Quality Specialist

Kevin Sedivec, Extension Rangeland Management  
Specialist

Rudy Radke, Extension Area Agriculture Diversification  
Specialist

Frank Casey, Assistant Professor, Soil Science Department

Dave Hopkins, Assistant Professor, Soil Science Department

Larry Cihacek, Associate Professor, Soil Science  
Department

Dale Siebert, Extension Agent, Richland County

At the end of each *Water Spouts* article, the author's name, telephone number and email address (if the author has one) are listed. If you have any questions about any article, please contact the author by whichever 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).

**Tom Scherer** (701) 231-7239  
Extension Agricultural Engineer  
[tscherer@ndsuxext.nodak.edu](mailto:tscherer@ndsuxext.nodak.edu)

## Consider Count When Planting Beans

The recommended seeding rates of dry beans and soybeans should be based on the number of beans planted per acre and not bushels or pounds of seed planted per acre. Seed count varies considerably within dry bean classes and among soybean varieties. The recommended planting rate for pintos is to plant a sufficient amount of live seed to obtain an established plant population of 70,000 plants per acre when planting in 30 inch row spacing. For navy beans, plant a minimum of 90,000 seeds per acre or even higher if using narrow row spacing. One also must allow for both germination and any seedling mortality problems due to soil crusting or use of a rotary hoe for weed control.

Seeding rates from 150,000 plants to 225,000 plants per acre do not change soybean yields in North Dakota. However, higher seeding rates (about 180,000-200,000) are suggested for narrow rows, (6-12 inches) compared to wider rows, (24 to 30 inches). Fewer seeds per foot of row in narrow rows may have more difficulty emerging than in wider rows if soil crusting should occur. Planting more seed may help overcome emergence problems. Soybean seed lots and varieties vary in number of seeds per pound. Seeding rate should also be adjusted for percent germination.

For example: 180,000 desired plants divided by the germination rate (.90) and then divided by 3,000 seeds per pound equals a seeding rate of 67 pounds per acre.

**Duane R. Berglund** (701) 231-8135  
NDSU Extension Agronomist  
dberglun@ndsuext.nodak.edu

## 2001 New Herbicide Review

Aim (FMC)

**Mode of action:** PPO inhibitor

**a.i.:** carfentrazone

**Crops:** Small grains, barley, oat, and corn.

**Comments:** DO NOT USE IN SOYBEAN! Labeled for preplant burndown and fallow prior to planting field corn, soybean and wheat with no planting interval restrictions since these crops are labeled and have established tolerances. Aim can also be used on fallow which includes CRP but do not use if the legume has emerged. Aim + Roundup enhances the speed of activity and adds control of susceptible weeds kochia, lambsquarters and pigweed. May provide partial control of wild buckwheat and Russian thistle. Crops without a tolerance must be planted 30 days or more after application.

Amplify (Monsanto)

**Mode of action:** ALS inhibitor

**a.i.:** cloransulam

**Crops:** Soybean

**Comments:** Monsanto will market FirstRate under the name Amplify for use with Roundup products for control and residual control of large-seeded broadleaf weeds.

BASF

**Phasing out:** Detail, TriScept, Tri-4, Scepter OT, Steel, Celebrity, Galaxy, Manifest, Storm.

BestShot (Dow)

**Mode of action:** ALS inhibitor + glyphosate

**a.i.:** cloransulam tankmixed with glyphosate

**Crops:** Roundup Ready soybean

**Comments:** A Dow program of a one-pass tankmix of FirstRate + Glyphomax or Glyphomax Plus for grass and improved broadleaf weed from Dow. FirstRate will provide residual control of some broadleaf weeds.

Boundary (Syngenta)

**Mode of action:** Acetanilide +Photosynthetic inhibitor

**a.i.:** metolachlor + triazine

**Crops:** Soybean

**Comments:** Contains 6.3 lb/gallon of active isomer of metolachlor + 1.5 lb/gallon of metribuzin. The rate of 1.5 pt/A of Boundary gives 1.24 pt/A of Dual II Magnum and 6 oz DF/A of Sencor. Compared to Turbo it is more metolachlor and less metribuzin. Marketed primarily in the Roundup Ready soybean system.

Callisto (Syngenta)

**Mode of action:** Carotenoid inhibitor - same as Balance

**a.i.:** mesotrione (ZA1296)= Reduced Risk Classification

**Crops:** Corn

**Comments:** Registration expected in 2001. POST application up to 30 inches tall. Symptoms are plant bleaching. Caution with Counter or tankmix with an OP. Active ingredient is based on secreted allelochemicals from Callistemon citrinus (Bottlebrush) after observing significantly less weed competition than plants around it. 9 day half-life — no carryover expected. Possible dicamba replacement.

Define (Bayer and Aventis)

**Mode of action:** Unknown

**a.i.:** fluthiacet

**Crops:** Corn and soybean.

**Comments:** Sold alone instead of only in premix as Axiom, Domain, Epic, etc. Aventis controls and services Define distribution in corn but the product is being co-marketed with Bayer. Requires water for activation. Crop rotation restrictions limit use in N.D.

Dow

**Phasing out:** Scorpion III, Broadstrike + Treflan.

Will co-market Rodeo and Accord with Monsanto.

DuPont

**Phasing out:** Pinnacle, Canopy, Reliance STS.

Eptam/Eradicane (Cedar Chemical)

**Mode of action:** Unknown

**a.i.:** EPTC

**Crops:** Dry beans, potatoes, corn.

**Comments:** Sold by Zeneca to Cedar Chem.

Extreme (BASF)

**Mode of action:** ALS inhibitor +glyphosate

**a.i.:** imazethapyr + glyphosate (Pursuit + Roundup Original)

**Crops:** Roundup Ready Soybean

**Comments:** ND rate is 2.25 pt/A and is equivalent to 3 fl oz/A of Pursuit and 18 fl oz of Roundup Original. Price is less than \$10/A. Nonionic surfactant (NIS) and ammonium sulfate (AMS) fertilizer are required. Some formulated products are currently available: Sensation from Rosens and Surfate from AGSCO. Extreme can be used in all of ND and in MN North of Hwy #210.

Gauntlet (FMC)

**Mode of action:** PPO + ALS inhibitor

**a.i.:** sulfentrazone + chloransulam

**Crops:** Soybean

**Comments:** Preemergence use and used with a grass program offers very good full-spectrum annual broad leaf weed control. Significant cost savings from buying each product independently.

Hornet (Dow)

**Mode of action:** ALS inhibitor + Growth Regulator

**a.i.:** flumetulam + clopyralid-K+

**Crops:** Corn

**Comments:** New K salt of clopyralid formulation contains 25% less ai than SP formulation but use rates will 25% more resulting in no change in ai/A (2 oz WDG = 1.6 oz SP. New formulation changes signal word from Danger to Warning.

## Outlook (BASF)

**Mode of action:** Acetamide (Mode of action unknown)

**a.i.:** dimethenamid-P (active isomer). 6 lb ai/A

**Crops:** Same crops as Frontier.

**Comments:** Use rates are 55% of Frontier rates. Will replace Frontier in future. Pending registration on potato and sugarbeet.

## Reglone (Syngenta)

**Mode of action:** Photosystem I inhibitor

**a.i.:** diquat- NH3 salt (2 lb ai/gallon)

**Crops:** Potato

**Comments:** Reglone has been used in Canada for several years and in 2000 will now become the U.S. standard formulation in the U.S. Same active ingredient as Diquat (diquat- dibromide salt). Labeled for preharvest desiccation of potato, alfalfa, clover, grain sorghum, and soybean seed crops.

## Roundup (Monsanto)

**Mode of action:** EPSP synthase inhibition

**a.i.:** glyphosate

**Crops:** Various

**Comments:** U.S price varies from 22.50 to \$40/gallon.

Glyphosate is available under the following labels:

1. 3 lb ae/gal ipa salt with full, partial or no adjuvant load.
2. 3 lb ae/gal (NH4)2 salt with full adjuvant load. - Touchdown 3
3. 3.7 lb ae/gal ipa salt with full adjuvant load. - Roundup UltraMax
4. 4 lb ae/gal ipa salt without adjuvants. - Several generics
5. 65% SG NH4 salt with full adjuvant load. (Roundup Ultra Dry)

## Registered Glyphosate Products:

Trade Name	Manufacturer	Active ingredients	lb ai or ae/gal	Adjuvant Load*
Backdraft	BASF	imazaquin + glyphosate-ipa	0.25 + 1.25	None
Campaign	Monsanto	glyphosate-ipa + 2,4-D-ipa	1.2 + 1.9	None
Cornerstone	Agrilience	glyphosate-ipa	3	Partial
Engage	UAP	glyphosate-AMADS	1.23+9.1	Partial
Expert	Novartis	s-metolachlor + atrazine + gly-ipa	1.73+2.13+1	None
Extreme	BASF	imazethapyr + glyphosate-ipa	0.17 + 2	None
Fallowmaster	Monsanto	glyphosate-ipa + dicamba acid	1.1 + 0.5	None
Fallow Star	Albaugh	glyphosate-ipa + dicamba acid	1.1+0.5	None
FieldMaster	Monsanto	acetochlor + atrazine +gly-ipa	2 + 1.5 + 0.56	None
Gly-Flo	Micro Flo	glyphosate-ipa	3	Partial
Glyfos	Cheminova	glyphosate-ipa	3	Partial
Glyphos X-tra	Cheminova	glyphosate-ipa	3	Full
Glyphomax	Dow	glyphosate-ipa	3	Partial
Glyphomax Plus	Dow	glyphosate-ipa	3	Full
Glyphosate Herb.	DuPont	glyphosate-ipa	3	Partial
Glyphosate Orig.	Griffin	glyphosate-ipa	3	Partial
Glypro	Dow	glyphosate-ipa	4	None
Glypro Plus	Dow	glyphosate-ipa	3	Full
Gly Star 5	Albaugh	glyphosate-ipa	3.7	Partial
Gly Star Original	Albaugh	glyphosate-ipa	3	Partial
Gly Star Plus	Albaugh	glyphosate-ipa	3	Full
Landmaster BW	Monsanto	glyphosate-ipa + 2,4-D-ipa	0.9 + 1.5	None
Land Star	Albaugh	glyphosate-ipa + 2,4-D-ipa	0.9 + 1.5	None
Protocol	Monsanto	glyphosate-ipa	3	Partial
Rattler	Helena	glyphosate-ipa	3	Partial
ReadyMaster ATZ	Monsanto	atrazine + gly	2 + 1.5	None
Rodeo	Monsanto	glyphosate-ipa	4	None
Roundup Custom	Monsanto	glyphosate-ipa	4	None
Roundup Original	Monsanto	glyphosate-ipa	3	Partial
RU Original RT	Monsanto	glyphosate-ipa	3	Partial
RU SoluGran	Monsanto	glyphosate-NH3	86.5%	None
RU/Private labels	Various	glyphosate-ipa	3	Partial
Roundup Ultra	Monsanto	glyphosate-ipa	3	Full
Roundup Ultra RT	Monsanto	glyphosate-ipa	3	Full
RU UltraDry	Monsanto	glyphosate-NH3	65%	Full
RU UltraMax	Monsanto	glyphosate-ipa	3.7	Full
Silhouette	Various	glyphosate-ipa	3	Partial
Touchdown 5	Syngenta	glyphosate-tms	3.45	Partial
Touchdown 3	Syngenta	glyphosate - 2(NH3)	3	Full

\* Full = No additional Non-Ionic Surfactant (NIS) needed.

Partial = Additional NIS needed.

None = Additional NIS at full rate required.

Studies in Minnesota, Nebraska, and Kansas confirm less weed control from application made after 6:00 pm. Iowa has seen similar results with Pursuit.

## Sonalan (Dow)

**a.i.:** ethalfuralin

**Crops:** Supplemental labeling allows use chemigation in dry beans and sunflower through pivot, lateral move, or end row sprinkler. Directions are specific for this use.

## Syngenta

**Phase out:** Broadstrike + Dual, Turbo, Bicep MAGNUM TR, Dual, Dual II, Bicep, Bicep Lite II. Only MAGNUM formulations will remain.

## Teamwork (Agrilience)

**Mode of action:** PPO + Triazine

**a.i.:** carfentrazone + atrazine

**Crops:** Co-pack for corn and sorghum.

## Ultra Blazer (BASF)

**Mode of action:** PPO inhibitor

**a.i.:** acifluorfen-Na salt

**Crops:** Soybean

**Comments:** A new formulation of Blazer with Ion Charge Technology that can reduce amount of crop injury similar to Flexstar but less than Cobra.

## Valor 51DF (Valent)

**Mode of action:** PPO inhibitor - Cell membrane disruptor

**a.i.:** flumioxazin

**Crops:** Soybean

**Comments:** Soil applied at 2 to 3 oz/A. Rates INCREASE as soil organic matter decreases. Similar to Authority/ Spartan herbicide except no carryover and better common ragweed control (P-F). Label in soybean expected in 2002. Research in alfalfa (established only), dry bean, field pea, mint, potato, onion and some vegetable crops are in development. Burndown will be allowed <30 days prior to planting wheat, corn, and sunflower. Provides E common mallow control also shows excellent algae control (on roofs). Shows white mold control in soybean. Very insoluble and does absorption does not change with pH as sulfentrazone.

**Richard Zollinger (701) 231-8157**

**NDSU Extension Weed Specialist**

**rzollinger@ndsuxt.nodak.edu**

## Miniature Pivots

Some people call them “mini-pivots,” others call them “micro-pivots.” Although they look like miniature versions of a standard, full-size center pivot, mini-pivots differ from standard pivots in several important areas.

The most noticeable difference is the height of the pivot point. On a standard pivot the pivot point and towers are typically 12 feet high; on a mini-pivot the pivot point and towers are 6 to 7 feet tall. The average span length between towers on a standard pivot is about 165 feet; on a mini-pivot they average about 100 feet. On mini-pivots, the supply pipes between towers are from 3 to 4 inches in diameter whereas on a standard pivot the common supply pipe is 6 5/8 inches in diameter. The smaller diameter of the supply pipe limits the effective length of the mini-pivots to about 800 feet, which is enough to irrigate about 50 acres. Because of their smaller size, they are lighter than standard pivots and may not be as prone to creating deep wheel tracks.

Most mini-pivots use standard single-phase 110-volt alternating current (AC) for the control panel. The tower drive motor uses direct current rather than three phase AC typical of standard pivots. Some manufacturers power the mini-pivot using batteries recharged by a solar panel. Another form of mini-pivot uses a single tower of standard size and span length with a large overhang and power it with an internal combustion engine

mounted on the tower. Mini-pivots use the same size drop tubes and sprinklers as standard pivots.

In addition to mini-pivots, some manufacturers have mini-lateral-move irrigation systems. Lateral-move systems (sometimes called linear-move systems) physically look like center pivots but are designed to move along the edge of a field rather than in a circle. They are commonly used for rectangular pieces of land. An advantage of mini-pivots over standard pivots is that they can be located in areas where it is difficult to obtain three-phase power. A disadvantage is their low height; they can't be used to irrigate tall crops such as field corn, sorghum or sudangrass.

For more information about mini-pivots, visit the following websites:

[www.titan2000.com](http://www.titan2000.com)

[www.agirrigation.net/hydrus/](http://www.agirrigation.net/hydrus/)

[www.minipivot.com/](http://www.minipivot.com/)

[www.reinke.com/domestic/library/mpivot.htm](http://www.reinke.com/domestic/library/mpivot.htm)



**Tom Scherer** (701) 231-7239  
NDSU Extension Agricultural Engineer  
tscherer@ndsuext.nodak.edu

### **Tech Tip: 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. It is common to visit an irrigation pumping plant and find the flow meter not working. 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.

Flow meters and pressure gages provide extremely valuable management information. Having an accurate measure of flow rate is important for proper chemigation, selection and modification of sprinkler nozzles, calculating the application rate of the pivot, checking the production of the well and tracking the performance of the pump. This is important information, so before the irrigation season starts, set up a program to fix or replace the flow meters on your wells. If your flow meter is working properly, consider removing the flow meter next 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 provide accurate information on the performance of your irrigation system.

**Tom Scherer** (701) 231-7239  
NDSU Extension Agricultural Engineer  
tscherer@ndsuext.nodak.edu