

Flow Meters

A Farmer's Perspective

Why On-Farm Flow Metering?

- You can't really manage what you don't measure!
- Different Crops Use Different Amounts of Irrigation
 - This can be significant in Cost/Returns Analysis for Budgeting and in actual Net Returns

Why On-Farm Flow Metering?

- Pivot & Pumping hours are only rough estimates
 - Nozzles & Pumps wear over time
 - End-gun Off/On changes volume
 - Non-Computer Pivot panels only track total hours

Why On-Farm Flow Metering?

- On-Farm Water Metering Is Likely To Be Mandatory In the Near Future

What I Want To Determine With On-Farm Flow Metering

1. Instantaneous Flow Rates

- Are my nozzles wearing out with age?
- Correlation between Pump HP and Flow rates using real-time ammeter readings
- Flow rates when End-guns On versus Off

What I Want To Determine With On-Farm Flow Metering

2. Total Volume of Water per Circle

- To determine what an Acre-Inch really costs?
- I do a full analysis of all Pumping Bills at year end

What I Want To Determine With On-Farm Flow Metering

- How much irrigation water do different Crops actually Use?
 - High Value, High Use – Hybrid Seed Canola
 - Medium Value, High Use – Various Spring Wheats
 - Medium Value, Low Use – Winter Wheat
 - Medium Value, High Use – Faba Beans
 - Medium Value, Low Use – Dry Bean

Hybrid Seed Canola



Spring Wheat



Winter Wheat



Solid Seeded Dry Beans



Faba Beans



What I Want To Determine With On-Farm Flow Metering

3. Volume of Water Used Domestically for my yard.
 - SMRID allows from 1 to 4 acre-feet of water to be used for domestic purposes on any Irrigated Parcel but it is not Monitored (yet)

What I Want To Determine With On-Farm Flow Metering

3. Volume of Water Used Domestically for my yard. (cont)

- My Yard domestic Dugout is filled through the pivot installed on the parcel
- My 2 Yards are approximately 2 acres each

LeRon Torrie yard





Our Farm

Image M.D. of Taber

Google earth



Imagery Date: 5/16/2009 lat 49.863050° lon -111.715151° elev 2618 ft eye alt 6177 ft

Considerations in Choosing a Farmer-Friendly Flow Meter

1. Cost
 - Under \$2000
2. Accuracy
 - +/- 1%??

Considerations in Choosing a Farmer-Friendly Flow Meter

3. Ease of installation

- How intrusive? Cutting & Welding Required?
- # of Diameters Before & After Required? How Long of a Straight Section Required in Total?

Considerations in Choosing a Farmer-Friendly Flow Meter

4. Durability & Longevity

- Moving Parts to Wear Out?
- K(eep) I(t) S(imple) S??
- Is Periodic Cleaning Required? Can Algae Build Up on the Inside?

Considerations in Choosing a Farmer-Friendly Flow Meter

5. Power Supply Required

- 110 Volt?
- 24 Volt?
- Batteries? How Long Will They Last?

Considerations in Choosing a Farmer-Friendly Flow Meter

6. Portability

- Difficulty to Move From One Location to Another?

7. Is Telemetry Possible – (Zimmatic Fieldnet)

Seametrics AG2000 Flow Meter



Seametrics AG2000 Meter

1. Cost: \$1925 (Oliver Irrigation)
 - New Pivot ~\$75,000; ($\$2000/\$75,000 = 2.7\%$)
2. Accuracy: +/- 1%

Seametrics AG2000 Meter

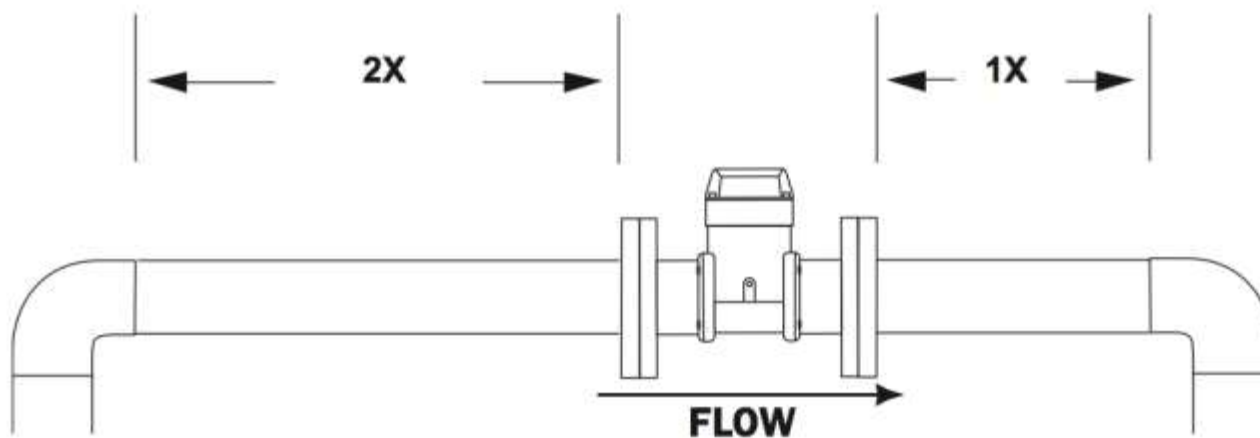
3. Ease of Installation:

- Available in 6", 8" or 10" Diameters
- Position In-line with Standard Bolted Flanges
- Minimum 2 Diameters Before and 1 Diameter After!

STRAIGHT PIPE RECOMMENDATIONS

(X = pipe diameter)

*Minimal straight pipe
required between elbows.
For other piping configurations,
consult factory.*



Seametrics Ag2000 Flow Meter

3. Ease of Installation – Minimum Straight Section Required for 8" Meter:

- In Front: $2 \times 8'' = 16''$
- 8" Meter = 14" long Flange to Flange
- After Meter = $1 \times 8'' = 8''$
- Minimum total length of Assembly:
 - $16'' + 14'' + 8'' = 38''$

Seametrics Ag2000 Flow Meter

- I Made My Assemblies: 30" Before (3.75x) and 20" After (2.5x) for a Total Length of 64" with Ring Lock Ends - M & F

My AG2000 Installation



My AG2000 Installation



My AG2000 Installation



My AG2000 Installation



Seametrics Ag2000 Flow Meter

4. Durability & Longevity

- No Moving Parts
- Simple Bolted Flanges to Mount
- Simple Open Interior – No Internal Protrusions to Catch Algae or restrict flow
- Molded Continuous Rubber Interior and Exterior Gasket Provides Leak-free Installation



Seametrics AG2000 Flow Meter

5. Power Supply Required

- Internal Batteries only - \$60 Lithium D
- Lasted 2 Seasons (prior time?)

Seametrics AG2000 Flow Meter

6. Portability

- I Mount My Assembly at the Pivot Point Between the Mainline Riser and the Pivot Inlet.
- I have to Make up a Short Ring-Lock Section to Accommodate the Meter for Each Different Pivot
- Battery Power Supply Means No Other Wiring Except Grounding.

Installation on Different Pivot



Seametrics Ag2000 Flow Meter

- Telemetry
 - Modules available for Data Transmission
 - Zimmatic Field-Net Compatible??

Lessons Learned So Far

- 1st Pivot Nozzle Wear
 - After 8 years, no appreciable Volume change from Original Pivot & Pump Design: 967 (950) gpm +2%
 - \$2.68 / Acre-Inch
 - Battery Life appears to be Acceptable; 2 years +
 - Winter appeared to have no affect on the Meter and it was left in place out in the field, though covered as recommended

Lessons Learned So Far

- 2nd Pivot – 20 years, 1040 (1000) gpm, 4% Wear
- This Pivot had highest Cost/hour and
- Highest Cost/Acre-Inch: \$2.96/Ac-Inch
- Will now Retrofit Pivot with new 10 psi I-Wobs under Growing Forward 2 Irrigation Efficiency Program: Cost Share 40%

Lessons Learned So Far

- For 2013, Our 2 Yards and 2 Houses used 2.35 acre-feet of water for Inside Domestic Water and Outside Yard Irrigation
- Each yard is allowed 4 Acre-Feet so we are in good shape as far as SMRID is Concerned!

Old Configuration – 30 psi, 40 Hp



New Configuration: 10 psi 30 Hp

