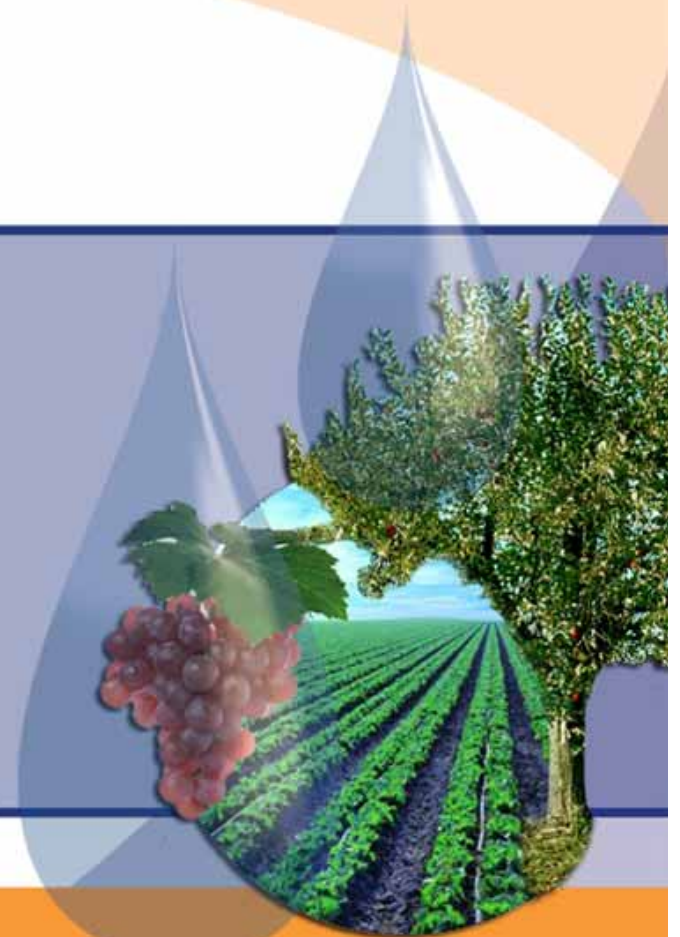


Benefits of water meters

If you can't measure it—you can't manage it



- Agriculture
- Landscape & Turf
- Greenhouse & Nursery
- Wastewater
- Mining

Water is a limited resource

- We need to manage it carefully



Why a flow meter?

- Effective flow measurement is the key to good water management—
- if you can't measure it, you can't manage it.
- Attention to good flow measurement will unusually result in water conservation through the prevention of over watering.

Typical applications for flow meters

- Agricultural
 - Drip/Micro systems
 - Flood
 - Sprinkler
 - Center pivot
- Nursery/greenhouse
- Landscape
- Waste water
- Industrial
- Others

If you can't measure it, you can't manage it.



- A water meter is as important to measure flow as a tape measure is to measure distance.
- Water meters are the tools that help measure the correct amount of water that is applied.

Monitoring system flow rates

- Day one
 - Check of system design
 - Total flow rate
 - Did you get the right emitters?
 - The right emitter spacing?
 - The right size zones?

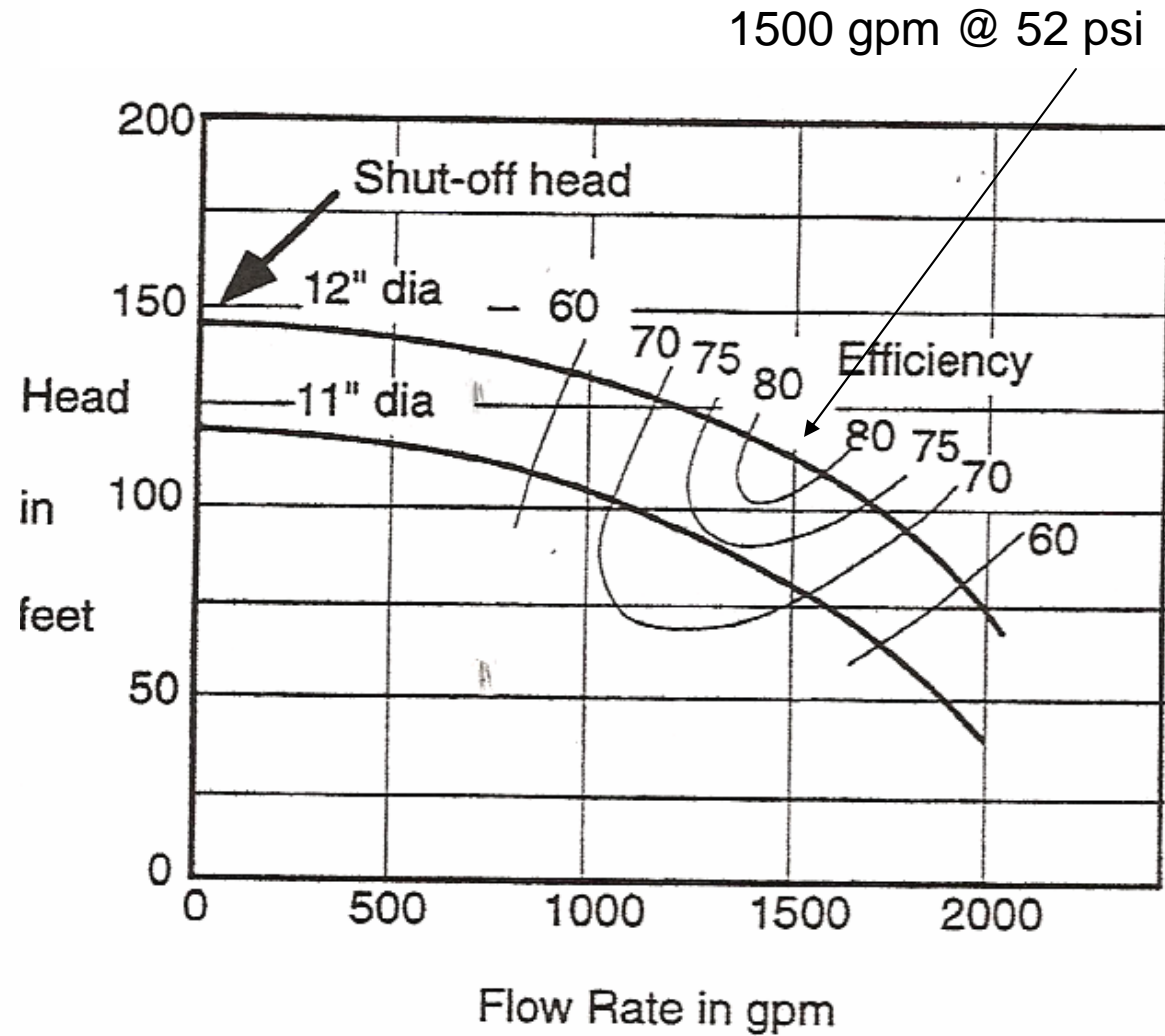


Monitoring system flow rates

- Day one
 - Flow rate vs. pressure
 - Did you get the right pump?
 - Is the pump working properly?



Do you have the right pump?



The cost of poor pump efficiency

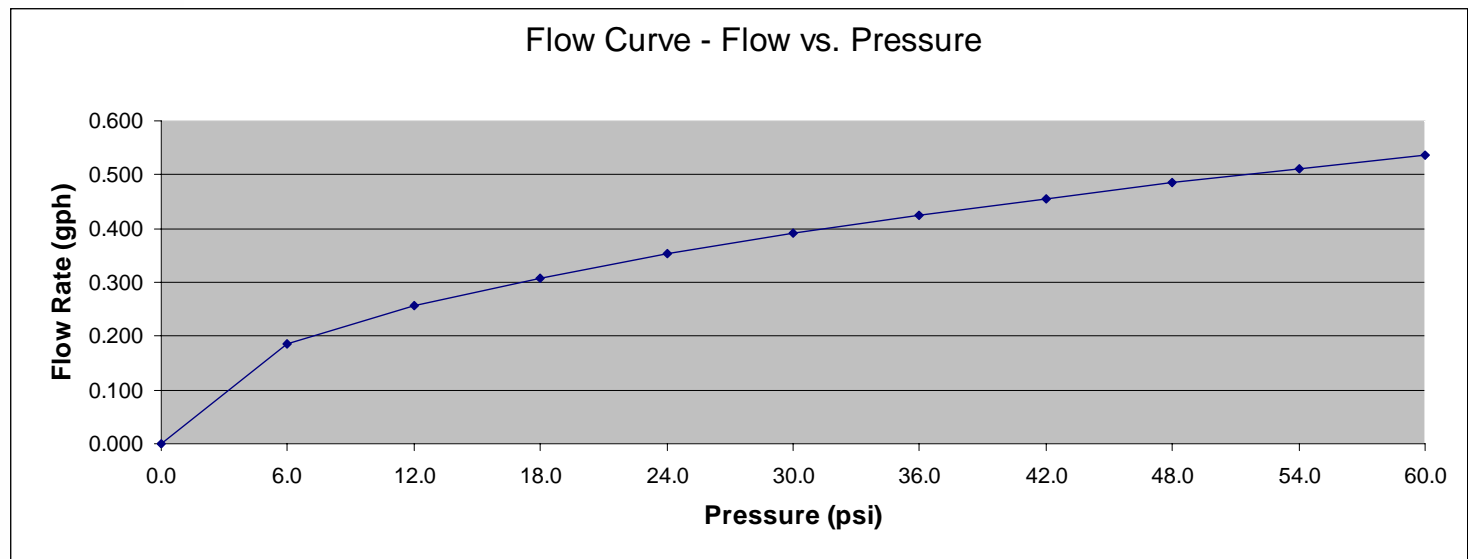
	EXISTING EFFICIENCY	IMPROVED EFFICIENCY	ESTIMATED SAVINGS
6. kWh/AF:	460	289	171.4
7. Estimated Total kWh:	112,829	70,830	42000
8. Average Cost per kWh:	\$0.16		
9. Average Cost per hour:	\$13.46	\$10.14	\$3.32
10. Average Cost Per Acre Ft.:	\$74.12	\$46.53	\$27.59
11. Estimated Acre Ft. Per Year :	245.1	245.1	
12. Overall Pumping Efficiency:	42.1%	67.0	
13. <i>Estimated Total Annual Cost:</i>	\$18,165.51	\$11,403.58	\$6,761.93

Monitoring system flow rates

- Over time
 - Are things going wrong?
 - Total flow rate
 - Low flow rates:
 - » Are emitters plugging?
 - » Are block pressure set correctly?
 - » Are all zone valves on?
 - » Look for problems
 - High flow rates
 - » Are emitters failing open?
 - » Are block pressures set correctly?
 - » Are too many zones open?
 - » Line breaks?
 - » Look for problems
 - Flow rate vs. pressure
 - » Is the pump working properly?

Other benefits of water flow meters

- Volumetric deliver to the field is more accurate
 - Emitters flow \pm % of nominal
 - PC emitter flows change over time in addition to \pm % of flow



Other benefits of flow meters

- Proportional chemical injection



Other benefits of flow meters

- Calibrate time based delivery to provide more accuracy



Other benefits of flow meters

- Assess irrigation efficiency or irrigation scheduling accuracy.
 - Check and balance—did you under irrigate or over irrigate
 - If the crop needed 25” of water based on ET—how much was delivered over the crop season or in a single irrigation event.
 - If the system Emission Uniformity is 90% and 35” was used is this good?

We can do better

- Efficiency is $25''/35'' \times 100 = 71\%$
- How much should we have used?
 - $25''/90\% = 27.8''$
- How much does this cost?
 - Over watering in the amount of 7'' per acre
 - Cost of $\frac{1}{2}$ ft of water per acre
 - Cost of pumping water
 - Cost of loss of crop or crop quality
 - Leaching of fertilizers

- Check of water district delivering water—
are you paying for water not received?
- Government requirement for water
metering.

