



**SLOUGHHOUSE**  
Resource Conservation District  
HERALD | SLOUGHHOUSE | WILTON

## Mobile Irrigation Lab

- Launched June 2024
- FREE Irrigation Evaluations (Drip, Microsprinkler, Solid-Set)
- A FREE Pump Efficiency test can also be conducted at a later date.
- Confidential report provided to owner or grower/irrigator.
- Sign Up TODAY!



# Water Efficiency Technical Assistance (WETA) Program

The Mobile Irrigation Lab has been funded by the Water Efficiency Technical Assistance (WETA) grant from the California Department of Food and Agriculture.



# How can the FREE Mobile Irrigation Lab benefit you?

- Cut irrigation costs!
- Use water more efficiently and effectively
- Better water distribution!
- Shorter pump run times!
- Better yields!
- Better awareness of the system!!
- Recommendations that can help improve overall system performance!



# What Service does the Mobile Irrigation Lab provide?

- Distribution Uniformity (DU) a measure of how evenly water is applied to the crop.
- Emitter/sprinkler flow rates
- Amount of water applied during an irrigation event (application rate)
- Map of collected pressures and flows
- Plugging/clogging
- Recommendations for system improvements and maintenance
- Estimated system run times
- Detailed soil report
- Coordination of a free pump efficiency evaluation



# Well/Site Information

- First, we ask to speak with the owner or irrigation manager before appointment to acquire irrigation design plans, crop information, basic irrigation information, hours of operation, etc.
- Next, we ask questions about the well, filter, & chemical injection systems to get a baseline of the system.
- Then pressures will be taken to record pump discharge pressure and the difference in pressures downstream of filters and control valves.
- Backflush information. Must ensure backflush cycle does not run during evaluation





FILTRATION		
<i>Filtration should occur downstream of the pump. Devices located upstream of the pump should be selected in the "prefiltration" section above.</i>		
Type of filter downstream of pump (select all that apply):		
32	Tubular screen?	Please Select From List
33	Overflow screen?	Please Select From List
34	Media filter?	Please Select From List
35	Sand (centrifugal) separator?	Please Select From List
36	Disc filter?	Please Select From List
37	"Vacuum cleaned" tubular screen?	Please Select From List
38	Automatic flush on the primary filter?	Please Select From List
<i>Leave Question 39 blank if not applicable.</i>		
39	Typical hours between backflushing:	hours
CHEMICAL INJECTION SYSTEM		
40	Location of fertilizer injector with respect to filter:	Please Select From List
41	Location of pesticide injector with respect to filter:	Please Select From List
42	Location of acid injector with respect to filter:	Please Select From List
43	Location of gypsum injector with respect to filter:	Please Select From List
44	Frequency of chlorine or polymer injection:	Please Select From List
45	Frequency of acid injection:	Please Select From List
46	Frequency of hose/tape flushing:	Please Select From List
<i>If no injection systems, skip Question 47.</i>		
47	Do any of the injection systems use a throttling valve on the mainline to create a pressure differential?	Please Select From List
PUMP STATION MEASUREMENTS		
48	Pump discharge pressure:	psi
49	Pressure downstream of filters and control valves:	psi
<i>Optional Pressure Values:</i>		
50	Total filter loss:	psi
51	Total pump control valve loss:	psi
52	Loss from throttled manual valves:	psi



# Checking Pressures throughout Block/Set

- Check manifold/s & inlet/s pressures
- We obtain pressures from at least 6 different locations/lines within block/set that includes at least 30 different pressure readings.
- Pressure map is developed to reference





# Pressures(continued)

- Balanced pressures are an incredibly crucial factor that determines flow rates at each sprinkler or emitter (unless pressure compensating, or flow control devices are used). The MIL focuses on three key areas.
  - the variation at inlets along main or submain lines
  - the variations along individual hose lines
  - the overall variation from the lowest recorded to the highest
- Pressure differences between manifold inlets & hose inlets on a manifold are a major possible cause of non-uniformity.
- Pressures below 7 psi are usually a cause for concern especially for PC emitters.
- Defective or no pressure regulators
- Hose screens washers





**Flow Tests** - After pressure tests are completed, flow tests are performed at 3 different locations with the block set.



# Flow Tests

- Two different flow tests are performed:
  - **Global Distribution Uniformity(Global DU)**
  - **Flow Distribution Uniformity (Flow DU)**

**Global DU** is a calculation of flow rates, combined with system pressures, sprinkler spacing and uneven drainage. Additionally, the global DU does not give equal weight to the 3 locations where emitter flow rates were collected (typically 3 areas of different pressures).

**Flow DU** is a much simpler calculation where all the collected flow rates are added up and divided by 60 to get the average. The average of all 60 flows is then divided by the average of the low quarter (the average of the lowest 15 flows).

- The flow DU shows extreme ranges within a system. If there is a high or low pressure point in a system, flow rates can differ compared to other areas, even if it is a relatively small section

# Common Flow Problems

- **Leaks** - can be caused by faulty equipment, faulty installation, or animal problems. Faulty equipment should be replaced. Faulty installation should be corrected. Animal problems should be addressed, and future problems prevented. Hoses can be buried at a shallow depth to protect against rabbits and coyotes.
- **Plugging** - Plugging problems due to bacterial growth often do not show up the first year or two of drip system operation, and then may reach suddenly catastrophic proportions unless chemicals are injected on a routine basis.
  - Hoses should be flushed for several minutes at least once a month or quarterly during irrigation season.
  - Chemical precipitation (usually calcium deposits) can plug emitters. This only occurs with certain waters, and can be treated by continuous injection with an acid. SO<sub>2</sub> gas, sulfuric acid, and some special polymer compounds are designed to prevent this problem.
  - Chlorine is typically used to inhibit bacterial plugging of drip systems. Recommended continuous dosages vary from 0.5 to 1 ppm measured at the ends of hoses. Timing of injections usually range from continuous injection to once per week. The dosage and timing will depend upon the water quality

# Hose Line & Emitter Plugging

The MIL inspects hose lines for clogs or emitter plugging. It is very common to find clogged emitters due to various reasons such as:

- Clay
- Sand
- Bacteria/algae
- Precipitate
- Insects
- Plastic Parts
- Cracked hoses, rodents



# Open Hose Lines to Check for Plugging/Contaminants



# Measuring Wetted Areas

- It's a common problem that not enough soil surface is wetted by emitters or sprayers. This may be caused by not having enough emitters per plant, interference of spray patterns, a very coarse textured soils or the combination of the three.
- If only a small amount of the soil volume is wet, it is very possible to lose a large part of the irrigation water to deep percolation



# Evaluation Reports

- A detailed evaluation report will be provided to owner/grower within 1-2 months of the evaluation date. The reports include:
  - Key findings & issues
  - Recommendations
  - Flow DU & application rate results
  - Global DU results
  - Pressure & Flow Location Map
  - Estimated monthly irrigation run times
  - NRCS Soil Report



[REDACTED] - Block 2 - Evaluation Report  
[REDACTED]



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Evaluation Date: 07/29/2024

[Sloughhouse Resource Conservation District](#)

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# How to Sign Up

- Contact Chris Timmer, Water Efficiency Program Coordinator:
  - P: 916-628-0369
  - Email – [Chris@sloughousercd.org](mailto:Chris@sloughousercd.org)
  - Website - [sloughousercd.org](http://sloughousercd.org)

QR Code:



## Sloughouse RCD's Mobile Irrigation Lab Free Irrigation Evaluations

The Sloughouse Resource Conservation District (SRCD) is offering **FREE** irrigation evaluations to growers and land owners within Sloughouse RCD boundaries! The Mobile Irrigation Lab is a one-on-one consultation with growers that focuses on irrigation efficiency and management that can help you save water and energy.

### SERVICES PROVIDED:

- Distribution uniformity and application rate measurements which measure how evenly water is distributed on crops
- Pressure & Flow tests
- Plug/leak measurements.
- Recommendations for system improvements.
- Coordination of free pump efficiency testing (tests are limited, one per grower).

### HOW TO SCHEDULE:

If you are interested in receiving a **FREE** irrigation system evaluation, please complete this questionnaire to qualify. Translation services can be provided if requested. Please click the link below or take a picture of QR

Code:



If you have questions regarding the MIL, please contact Chris Timmer, Water Efficiency Program Coordinator at (916) 628-0369 or [chris@sloughousercd.org](mailto:chris@sloughousercd.org). Or go to the Sloughouse Website for more information: [www.sloughousercd.org](http://www.sloughousercd.org)



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