Irrigation Water Management
(show me the numbers!)

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W-SARE Cross Training

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Terms and Units

- Total amount of water used (Acre-Ft or AF)

- Pump flow rate (gpm, gallons per minute)

- Irrigation application rate (inches/hr)

- Pressure (psi, pounds per square inch)

- Area (Ac, acres; or 43,560 square feet)

To manage irrigation and/or nutrient application:

We need to know

1) Amount of water applied per irrigation

2) Total amount of water applied

How to use irrigation system information to determine application rate (in/hr) and total flow rate pumped (gpm)

Why is this important?

1) Check the flow meter at the pump

2) Check the information provided by the grower

3) Determine the number of inches of water applied to compare with crop ETc

What information do you need?

- Under these conditions:
  - Crop: Strawberries and vegetables
  - One pump per block
- Bed width (W)
- Flow rate of the drip irrigation (X gpm/100ft)
- Number of drip lines per bed (Y)
- Size of the irrigated block
- Hours of irrigation

Strawberries

Strawberries

- Bed width = 4 ft
- Irrigation system
  - Drip, 2 lines per bed

  - 0.67 gpm/100ft at **8 psi**
- Block size = 5 Ac
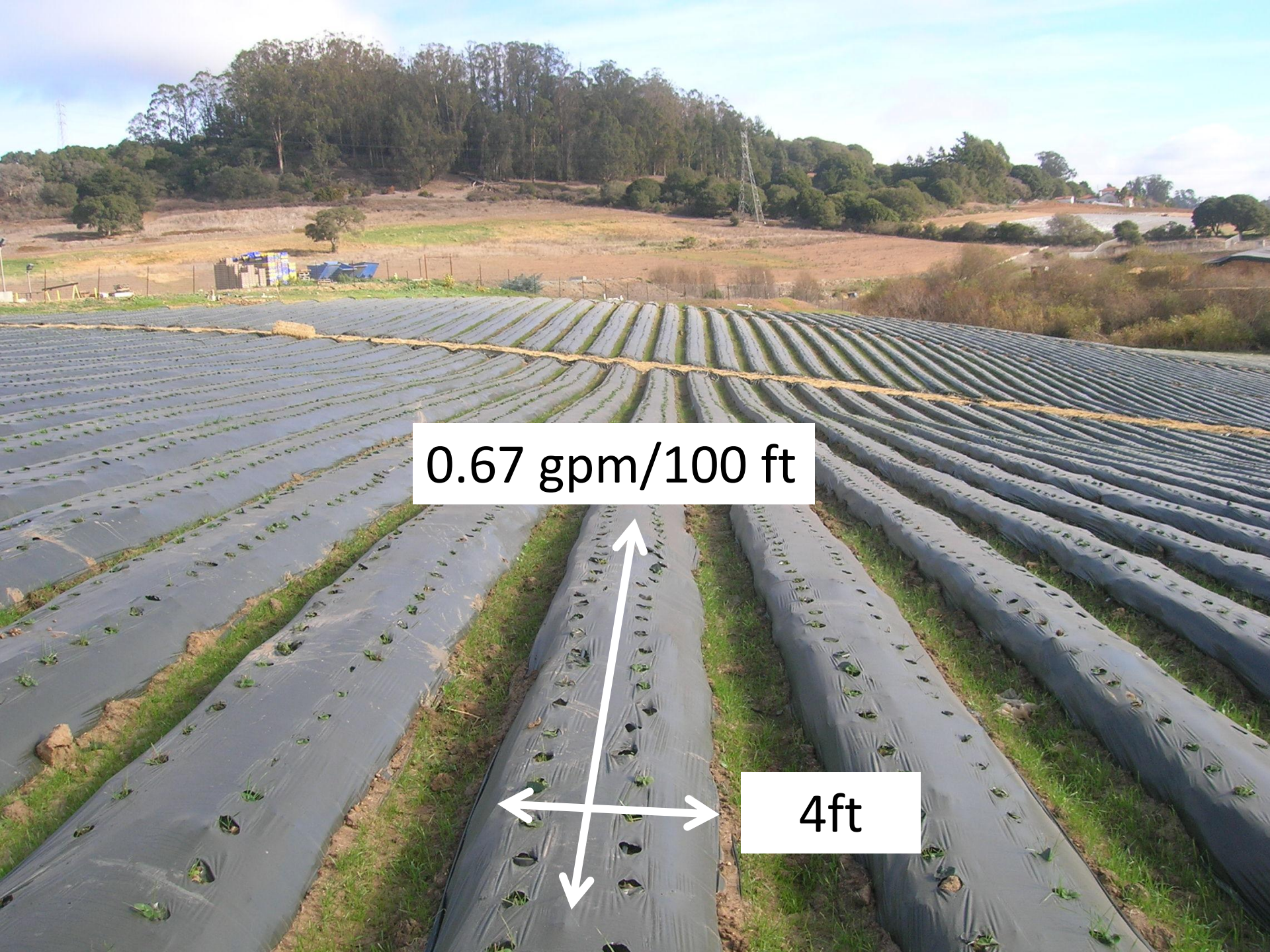- Irrigation time = 2 hrs

Aqua-Traxx®

5/8"
16 mm

Available Wall Thickness:
4 mil, 6 mil, 8 mil, 10 mil, 12 mil, & 15 mil

	Q-100 GPM @ 8 PSI			
Outlet Spacing	**0.13 GPH Emitter**	**0.20 GPH Emitter**	**0.27 GPH Emitter**	**0.34 GPH Emitter**
4"	-	-	1.34	-
8"	0.34	0.50	0.67	0.84
12"	0.22	0.34	0.45	0.56
16"	0.17	0.25	0.34	0.42
24"	0.11	0.17	0.22	0.28

0.67 gpm/100 ft

4ft

Strawberries

- Bed width = 4 ft
- Drip, 2 lines per bed @ Toro 0.67 gpm/100ft
- Block size = 5 Ac
- Irrigation time = 2 hrs

Block Flow Rate (gpm)= (# drip lines) x [(drip flow rate, gpm/100ft)/ (bed width, ft)] x (block area, ft^2)

Block Flow Rate = (2 lines) x [0.67 gpm/ (100ft x 4ft)] x (5 Ac x 43,560 ft^2/Ac)

Strawberries – Flow Rate

- Bed width = 4 ft
- Drip, 2 lines per bed @ Toro 0.67 gpm/100ft
- Block size = 5 Ac
- Irrigation time = 2 hrs

Block Flow Rate = (2 lines) x [(0.67 gpm/ (100 ft x 4ft)] x (5 Ac x 43,560 ft^2/Ac)

Block Flow Rate= 730 gpm

or

Flow Rate= 146 gpm/Ac

What is the flow meter reading?

- Depends on the flow meter
  - Installation
  - Maintenance
  - Age
- Depends on the irrigation system
  - Leaks
  - Pressure variation

Block Flow Rate= 730 gpm

Strawberries – Application Rate

- Bed width = 4 ft
- Drip, 2 lines per bed @ Toro 0.67 gpm/100ft
- Block size = 5 Ac
- Irrigation time = 2 hrs

Application Rate (in/hr)= 96.3 x (flow rate, gpm) / (area, ft^2)

Application Rate = 96.3 x (2x0.67 gpm)/ (400 ft^2)

Application Rate = 0.32 in/hr

Strawberries – Total Applied

- Bed width = 4 ft
- Drip, 2 lines per bed @ Toro 0.67 gpm/100ft
- Block size = 5 Ac
- Irrigation time = 2 hrs

Total Depth Applied = (application rate) x (time)

Total Depth Applied = (0.32 in/hr) x (2 hrs)

Total Depth Applied = 0.64 in

Total Depth Applied = 0.64 Ac-in/Ac

Aqua-Traxx® PERFORMANCE CHARTS

5/8"

Emitter Flow Rate 0.27 GPH @ 8 psi

EA5XX0867   LENGTH OF RUN IN FEET

.67 gpm PER 100 FEET @ 8 psi

0% SLOPE   **INLET PRESSURE**

EU	6	8	10	12	14
90	413	416	418	420	421
85	520	524	527	529	531
80	605	610	613	617	619

Aqua-Traxx® PERFORMANCE CHARTS

5/8"

Emitter Flow Rate 0.27 GPH @ 8 psi

EA5XX0867 LENGTH OF RUN IN FEET

.67 gpm PER 100 FEET @ 8 psi

2% UP

EU	6	8	10	12	14
90	145	181	211	236	256
85	221	267	303	331	352
80	276	327	366	395	419

Romaine Lettuce

Vegetables

- Bed width = 40 inch
- Irrigation system
  - Drip, 1 line per bed
  - 0.34 gpm/100ft at **8 psi**
- Block size = 5 Ac
- Irrigation time = 5 hrs

Vegetables

- Bed width = 40 inch = 3.3 ft
- Drip, 1 line per bed @ 0.34 gpm/100ft at 8 psi
- Block size = 5 Ac; Irrigation time = 5 hrs

Block Flow Rate (gpm)= (# drip lines) x (drip flow rate/bed width) x (block area)

Block Flow Rate = (1 line) x [(0.34 gpm/(100 ft x 3.3 ft)] x (5 Ac x 43,560 ft^2/Ac)

Block Flow Rate = 224 gpm

or

Block Flow Rate = 45 gpm/Ac

Vegetables

- Bed width = 40 inch = 3.3 ft
- Drip, 1 line per bed @ 0.34 gpm/100ft at 8 psi
- Block size = 5 Ac; Irrigation time = 5 hrs

Application Rate (in/hr)= 96.3 x (flow rate, gpm) / (area, ft^2)

Application Rate = 96.3 x (0.34 gpm)/ (330 ft^2)

Application Rate = 0.1 in/hr

Vegetables

- Bed width = 40 inch = 3.3 ft
- Drip, 1 line per bed @ 0.34 gpm/100ft at 8 psi
- Block size = 5 Ac; Irrigation time = 5 hrs

Total Depth Applied = (application time) x (time)

Total Depth Applied = (0.1 in/hr) x (5 hrs)

Total Depth Applied = 0.5 Ac-in/Ac

THANKS

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