SOP 16 Distribution uniformity evaluation for greenhouse pot micro-irrigation system

Updated 9/9/09

Materials needed:

- 1. 300 ft measuring tape
- 2. Clip board
- 3. Data sheet
- 4. Sharpie pen
- 5. Labeling tape
- 6. 12 ft tape measure
- 7. Flags
- 8. 20 0.5 L water collection cups (flat bottom)
- 9. 2 of each: 100 ml, 250 ml, and 500 ml graduated cylinders
- 10. 2 funnels
- 11. 10 Schrader valves with barbs
- 12. Stop watch
- 13. Calibrated pressure gauge with Schrader adapter
- 14. Scales with 2 kg and 50 kg capacities
- 15. Extra batteries for scale

## Procedures:

Description of greenhouse area:

- 1. Determine the crop
- 2. Measure longest and shortest bench.
- 3. Determine width benches
- 4. Determine spacing of benches
- 5. Determine width of irrigation block
- 6. Determine area of irrigation block
- 7. Determine rows of pots per bench
- 8. Determine number of rows of lateral (polyethylene) lines per bench
- 9. Determine in row spacing of pots
- 10. Determine number of emitters per pot
- 11. Determine inside diameter of lateral (polyethylene) lines.
- 12. Determine manufacturer's emitter discharge rate and if pressure compensating
- 13. Map irrigation block to be evaluated and location of measurements

Before irrigating :

- 1. Identify 10 areas to measure lateral line (polyethylene) pressure and emitter discharge rate. Identify each evaluation area on map by codes A,B,C, etc. and put a label on each area with tape.
- 2. Use tape to label 30 potted plants that will be used to evaluate distribution uniformity (1-30)
- 3. Record initial weight of potted plants.

4. Record starting flow meter reading and start time of the irrigation

After the irrigation system is turned on and fully pressurized:

- 1. Measure discharge rate of emitters and lateral line pressure:
  - a. Place an emitter into a 1 L plastic collect bottle and start stop watch
  - b. After 30 seconds place the next emitter into a collection cup.
  - c. Repeat steps "a" and "b" until 10 emitters are measured.
  - d. Remove the first emitter from the collection cup after 10 minutes.
  - e. Remove the other cups @ 30 second intervals.
  - f. Install barbed Schrader valves adjacent to areas where emitter discharge rate was measured.
  - g. Record pressures with a calibrated gauge.
  - h. Measure volume of water in each collection cup and record cup number by area (A, B, C).
  - i. Remove Schrader valves and reinstall emitters or goof plugs

After the irrigation system is turned off:

- 2. Measure applied water uniformity of micro sprinkler pattern in each area:
  - a. Record final flow meter reading and time that the irrigation system was turned off.
  - b. Record final weight of each of the 30 pots that were weighed before starting the irrigation.

Calculations:

- 1. Calculate overall emitter discharge rate (gal/minute/emitter)
- 2. Calculate application rate of the irrigation system (inches/hour)
- 3. Evaluate pressure *vs* emitter discharge rate
- 4. Calculate application DU for the lowest quarter of the irrigation block
- 5. Calculate the 10% scheduling coefficient for the irrigation system
- 6. Calculate the CU for the irrigation block

Comments

pressure compensating inside diameter of lateral (polyethylene)lines (inches) number of lateral (polyethylene) lines per bench	number of emitters per pot manufacturers emitter discharge rate (gal/hr)	longest bench (feet) irrigation block width (feet)	rows of pots ber bench in row pot spacing (feet) shortest bench (feet)	crop bench width(feet) bench spacing (feet)	Location	Grower
					Block	Date

Grower	Date	
Location	Irrigation block	

time (min)			
collection volume (ml)			
cup 1			
cup 2			
cup 3			
cup 4			
cup 5			
cup 6			
cup 7			
cup 8			
cup 9			
cup 10			
cup 11			
cup 12			
cup 13			
cup 14			
cup 15			
cup 16			
cup 17			
cup 18			
cup 19			
cup 20			

time (min)		
I	pressure (psi)	
cup 1		
cup 2		
cup 3		
cup 4		
cup 5		
cup 6		
cup 7		
cup 8		
cup 9		
cup 10		
cup 11		
cup 12		
cup 13		
cup 14		
cup 15		
cup 16		
cup 17		
cup 18		
cup 19		
cup 20		

Grower\_\_\_\_\_

Date	
	_

\_\_\_\_\_

Location \_\_\_\_\_ Irrigation block \_\_\_\_\_

initial flow meter reading final flow meter reading	
start time	end time
initial wt (g)	final wt (g)
pot 1	pot 1
pot 2	pot 2
pot 3	pot 3
pot 4	
pot S	pot S
pot 8	pot 6
pot 7	pot 7
pot 8	pot 8
pot 9	pot 9
pot 10	pot 10
pot 11	pot 11
pot 12	pot 12
pot 13	pot 13
pot 14	pot 14
pot 15	pot 15
pot 16	pot 16
pot 17	pot 17
pot 18	pot 18
pot 19	pot 19
pot 20	pot 20
pot 21	pot 21
pot 22	pot 22
pot 23	pot 23
pot 24	pot 24
pot 25	pot 25
pot 26	pot 26
pot 27	pot 27
pot 28	pot 28
pot 29	pot 29
pot 30	pot 30
pot 31	pot 31
pot 32	pot 32
pot 33	pot 33
pot 34	pot 34
pot 35	pot 35
pot 36	pot 36
pot 37	pot 37
pot 38	pot 38
pot 39	pot 39
pot 40	pot 40

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