Conclusions/Recommendations

- The actual flow rates of point source emitters at substandard pressure will be less than those specified by the manufacturer and this must be considered when designing and setting up a low pressure drip irrigation system.
- While the results of our study provide an indication of emitters that may perform well at low pressure, the irrigators should measure the actual flow rates of the selected emitters after setting up their systems. This is because even slight differences in lateral lengths, emitters per lateral, height of water level (head) above emitters, etc. between the actual system and the system that generated the tabular values in our study will affect flow rate.
- The irrigator should foremostly select an emitter that exhibits a high water application uniformity (i.e. > 0.9) and then consider a flow rate that will satisfy the plant's maximum daily water requirement.

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Scheduling Irrigations

- Once the flow rate is identified, irrigations can be scheduled accordingly.
  - Example:
    - In our study, we found that peak daily, per plant water requirements for maximum production ranged from about 0.6 gals for chile peppers to slightly more than 1 gal for tomatoes.

Emitters exhibiting water application uniformities of > 0.9 and flow rates of > 0.3 gph at 5.5 ft of head (and WAUs of > 0.9 at 3.5 ft of head)

Emitter*		Flow Rate (gph)	Water App. Uniformity	FR/WAU @ 3.5 feet
Orbit 4G (flag)		0.79	0.96	
D 043 →		0.48	0.96	0.38/0.92
D 006		0.44	0.95	
D 001 →		0.45	0.95	
D 013		0.35	0.94	0.25/0.93
Orbit 2G →		0.44	0.93	
D 044		1.12	0.93	
D 002 →		0.89	0.93	
D 004		0.76	0.93	

*Orbit models from Home Depot; 'D' model numbers from 'The Drip Store'

Other Recommendations

- Keep laterals as short as possible.
- Lay out system on level or slightly down sloping ground
- Flush drip lines frequently
- Split larger systems into smaller zones using inexpensive ½ inch valves
- Schedule irrigations appropriately using ET estimates.

Equation (Irrigation Requirement)

$$IR = ET_r \times AF \times D^2 \times 0.49$$

Where:

IR = daily irrigation requirement per plant (gals)

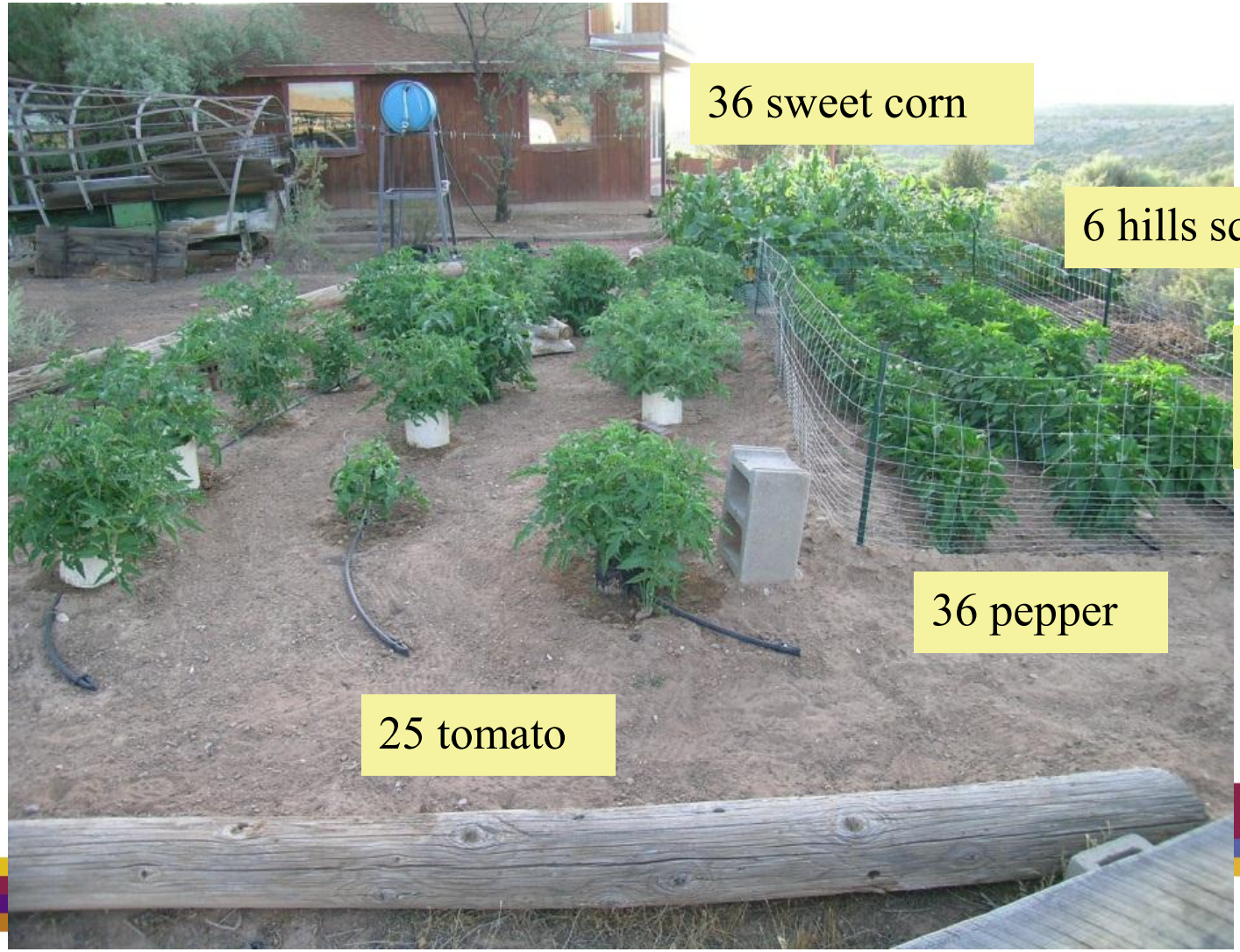
ET_r = reference ET based on weather (averages 0.3 to 0.35 inch per day in summer)

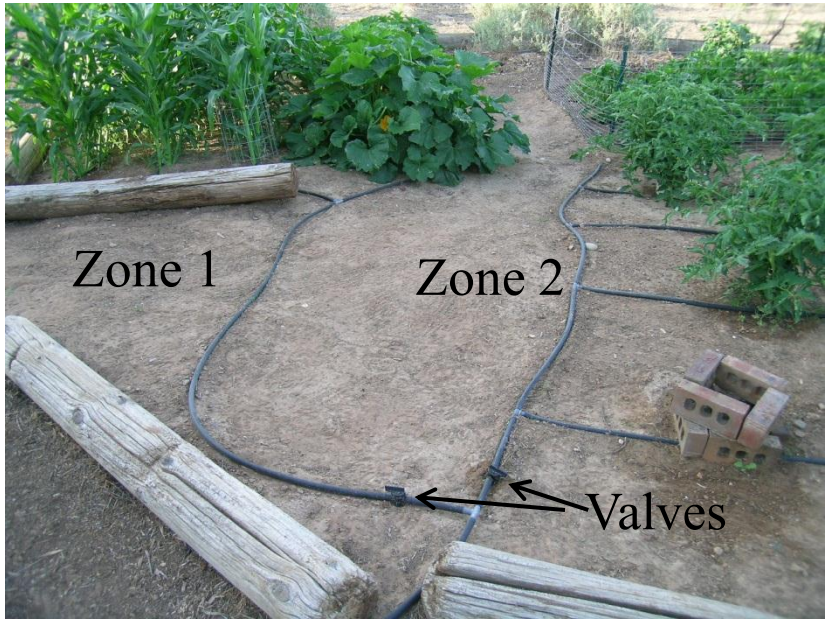
AF = adjustment factor for plant (0.8 for chile, 0.7 for tomato, 0.9 for sweet corn)

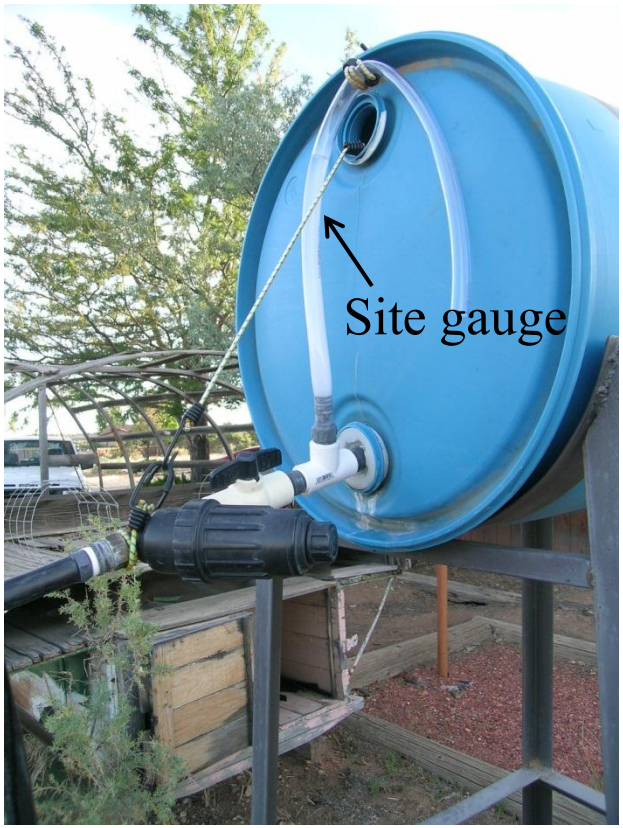
D = plant canopy diameter in feet

0.49 = constant to convert D to canopy area and inches to gallons

Low Pressure System in Action - 2012







Two zones – each irrigated daily (45 gallons/zone)

Some Advantages over High Pressure Drip Systems

- Stainless steel clamps not required.
- Pressure reducer and backflow prevention not required
- Fertilizer can be added to water in tank (injector not required)
- Water loss in crash event restricted

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Expensive, fancy stands not required

- Low pressure drip irrigation using appropriate emitters can be useful in irrigating:

Remote Gardens

Foods for Health Project
Dr. Kevin Lombard

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Reclamation - Drip

Low pressure system could be used to help establish conservation or reclamation species at remote locations.

Rainwater Catchment Systems

For watering landscapes and food gardens)

San Juan College – Farmington, NM

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Further Information

- For details related to these studies and more, please visit our website:

  http://farmingtonsc.nmsu.edu

- Or contact Dan Smeal: **dsmeal@nmsu.edu**