Department of Horticultural Science

Horticulture Information Leaflet 33-A

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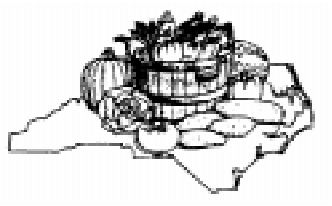

DRIP OR TRICKLE IRRIGATION SYSTEMS: AN OUTLINE OF COMPONENTS

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This checklist is provided to help growers recognize components of a drip or trickle irrigation system and to assist in planning and installing such a system. A grower should always consult an irrigation specialist or irrigation company that designs and installs drip or trickle systems to ensure the system is properly engineered and designed for his water source and field topography.

COMPONENTS

I. Water Source
- A. Surface (pond, river, creek)
- B. Well
- C. Municipal

II. Pumping System
- A. Electric powered pump
- B. Gas or diesel driven pumps
- C. Gravity system

III. Distribution System
- A. Permanent
  - 1. Underground mainlines
    - a. Pipe - PVC plastic or polyethylene plastic
    - b. Hydrants - attachment point for manifold lines
    - c. Drainage valves - important for maintenance of system
- B. Annual
  - 1. Above-ground mainline
    - a. Pipe
      - (1) Vinyl layflat hose
      - (2) Polyethylene plastic
      - (3) PVC plastic
      - (4) Aluminum
    - b. Fittings
      - (1) Hydrants
      - (2) Air relief valves
      - (3) Solenoid valves

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IV. Filtration System

A. Primary filters
   1. Media type - for use with surface or wells
   2. Screen type - some wells and community water systems or secondary for ponds
   3. Sand separators - remove sand from well and surface water
   4. Disk core - use as secondary filter for ponds

B. Secondary filter - screen type

C. Holding/settling ponds - Pump from wells to holding or settling ponds in cases where quantity of water may be limiting or a great amount of particulate matter may be present in the water source.

V. Injection Units-Chemicals/Fertilizer**

A. Electric powered pump
B. Water powered pump
C. Venturi
D. Water siphon devices
E. Considerations
   1. Fertilizers
      a. Must be completely soluble
      b. Compatibility of the materials
   2. Water treatment
      a. Chlorine (Bleach, HTH)
      b. Acids (phosphoric, sulfuric)
   3. Pesticides - consult your county extension agent

** Important: Install injector ahead of primary filters and prevention device.

VI. Systems Controls

A. Pressure regulators
B. Flow control valves
C. Pressure gauges
   1. Line gauges
   2. Portable check gauges
D. Air relief valves
E. Water meters
   1. Flow meters
   2. Totalizing meters
F. Soil moisture measuring devices (tensiometers or soil blocks)
G. Rain gauge
H. Daily water records

VII. Zone Controls

A. Hand valves
B. Electric valves (controlled by timer)
C. Volumetric valves (shuts off when a volume of water is applied)

VIII. Miscellaneous

A. Time clocks
B. Computer controllers
C. Radio control devices
D. Master computer controller

IX. In-field Delivery System

A. Feeder tubes (1/4 or 3/8" depending on length of rows)
B. Row laterals
    1. *Line source tubes - most row crops
        a. Water emission distances - 8, 12, 18 inches, etc.
        b. Flow rates (gallons per 100 feet per hour)

***Note: lower pressures associated with line source systems (3-10 psi)**

    2. *Point sources/emitters - fruit, nursery and greenhouse crops
        a. Types:
            1) Pre-spaced
            2) Plug-in
        b. Emission rates - 0.5, 1 and 2 gallons per hour

***Note: higher pressures associated with point source systems (10-20 psi)**

    3. Pressure (up to 50 psi) compensating emitters
        a. Types
            1) Pre-spaced
            2) Plug-in
C. Water quality maintenance (flushing)
    1. Manifold ends
    2. Row laterals