

Irrigation FACTSHEET



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TRICKLE IRRIGATION DESIGN INFORMATION

A systematic approach to trickle irrigation system design is outlined in this manual. The sample plans in Appendix F show the planning and layout requirements for a complete trickle irrigation system design. The following design sheet is a blank form of the design information presented in the sample plans. The designer should be conversant with trickle irrigation design principles and parameters presented in this manual before proceeding with any design.

CROP AND SOIL REPORT

Pit	Crop	Root Depth (ft)	Availability Coefficient	Soil Texture	A.W.S.C. (in/ft)	Max Lateral Water Movement radius (ft)
A	_____	_____	_____	_____	_____	_____
B	_____	_____	_____	_____	_____	_____
C	_____	_____	_____	_____	_____	_____

DESIGN PARAMETERS

Evapotranspiration Rate (ET) _____ in/day
 Effective Soil Water Storage Capacity _____ inches
 Effective Soil Water Storage Factor (S) _____
 Plant Spacing _____ x _____ ft²
 Plant Area (A) _____ ft²
 Crop Coefficient Factor (K) _____
 Emitter Type _____
 Emitter Operating Pressure _____ psi
 Emitter Discharge _____ gph
 Emission Uniformity _____
 Application Efficiency _____
 Water Source Capacity _____ gpm
 Pressure at Water Source _____ psi

PLANT WATER REQUIREMENTS

$$\text{Gallons/Plant/Day} = 0.623 \times \frac{\text{_____ in/day}}{\text{(ET)}} \times \frac{\text{_____}}{\text{S}} \times \frac{\text{_____ ft}^2}{\text{A}} \times \frac{\text{_____}}{\text{K}} = \text{_____ G/P/D}$$

$$\text{Trickle System Design Requirement TC} = \frac{\text{G/P/D} \times \text{L}}{\text{E} \times \text{Eu}} = \frac{\text{_____} \times \text{_____}}{\text{_____} \times \text{_____}} = \text{_____ G/P/D}$$

DESIGN DATA

Emitter Spacing _____ ft
 Emitters per Plant _____
 Zone Flow Rate _____ gpm
 Zone Operating Time Per Day _____ hrs/day

$$\text{Total System Operating Time} = \text{_____ hrs/zone} \times \text{_____ zones} = \text{_____ hrs}$$

FILTRATION REQUIREMENTS

Water Source _____
 Water Quality Ca, Mg, Na, K _____ mg/l
 Fe _____ mg/l
 S _____ mg/l
 pH _____
 Screen Mesh Size or Sand Media Selection _____

ZONE FRICTION LOSS CALCULATION

Maximum Pressure Variation in Zone _____ psi
 Maximum Lateral Length _____ ft

Average Flow per foot = $\frac{\text{emitter flow rate}}{\text{emitter spacing}}$ = $\frac{\text{_____ gph}}{\text{_____ ft}}$ = _____ gph/ft
 in lateral

Lateral line friction loss = _____ ft - _____ inch _____ pipe @ _____ $\frac{\text{gph}}{\text{ft}}$ = _____ psi

Emitter Barb Loss (30% of Lateral Line Loss) = _____ psi

Elevation Difference _____ ft = _____ psi

Total Lateral Pressure Loss = _____ psi

Header Line Friction Loss

Section	Flow	Pipe Length	Pipe Size	Friction Loss
_____	_____ gpm	_____ ft	_____ in	_____ psi
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Total Friction _____ psi

Header Line Fitting Loss (additional 20%) _____ psi

Elevation Difference _____ ft = _____ psi

Total Header Line Pressure Loss _____ psi

Total Zone Pressure Loss

Header Loss _____ psi + Lateral Line Loss _____ psi = _____ psi

MAINLINE FRICTION LOSS CALCULATION

x - x _____ ' - _____ " _____ @ _____ gpm - _____ x _____ = _____ psi
 x - x _____ ' - _____ " _____ @ _____ gpm - _____ x _____ = _____ psi
 x - x _____ ' - _____ " _____ @ _____ gpm - _____ x _____ = _____ psi
 x - x _____ ' - _____ " _____ @ _____ gpm - _____ x _____ = _____ psi

Total Friction Loss in Mainline _____

SYSTEM PRESSURE REQUIREMENT

Pressure Required at Zone Control _____ psi

Total Friction Loss in Mainline _____ psi

Elevation _____ ft = _____ psi

Miscellaneous Losses (Mainline valves, fittings, etc.) _____ psi

Total Pressure Requirement = _____ psi _____ ft

SYSTEM FLOW REQUIREMENT

_____ gpm / zone x _____ zones operating at one time = _____ gpm

HORSEPOWER REQUIREMENT

H.P. = $\frac{\text{_____ ft} \times \text{_____ gpm}}{3960 \times \text{_____ \%}}$ = _____ h.p.

FOR MORE INFORMATION CONTACT

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