Irrigation ASSOCIATION CERTIFICATION PROGRAM

Agriculture Specialty Surface Examination Equations

Basic and non-irrigation equations and conversions are assumed to be known by candidates. SIM refers to The Surface Irrigation Manual by Charles M. Burt copyright 1995. The equations are presented in the latest IA format and may appear different from those presented in the reference material.

1 cubic foot of water = 7.48 gallons 1 acre-inch = 27,154 gallons 1 acre-foot = 325,848 gallons

$PR = \frac{96.3 \times Q}{A}$	SIM p. 11.3
$AR = \frac{\text{Advance time to end of furrow}}{\text{Total time water is infiltrating at top of furrow}}$	SIM p. 4.1
$I = C \times T^{m} + b$	SIM p. 4.4
$D = K \times T^{n}$	SIM p. 4.5
$L = a \times T^{r}$	SIM p. 4.15
$\text{Depth} = \frac{\text{Flow rate} \times \text{Application rate}}{\text{Area}}$	SIM p. 8.1
$DU_{LQ} = \frac{\text{Average lowest quarter of depth infiltrated}}{\text{Average of depths infiltrated across field}} \times 100$	SIM p. 4.2
$IE = \frac{\text{Irrigation Water Beneficially Used}}{\text{Irrigation Water Applied}} \times 100$	SIM p. 13.8

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$IR_{gross} = \frac{IR_{net}}{E_a / 100}$	SIM p. 15.9
$H_v = \frac{V^2}{2 \times g}$	SIM p. 16.3
$Q = V \times A$	SIM p. 13.3
$H_1 + \frac{V_1^2}{2 \times g} + z_1 = H_2 + \frac{V_2^2}{2 \times g} + z_2 + H_L$	SIM p. 16.7
$H_f = 0.2083 \times \left(\frac{100}{C}\right)^{1.852} \times \frac{Q^{1.852}}{D^{4.866}} \times \frac{L}{100}$	SIM p. 16.13
$H_f = k \times \frac{V^2}{2 \times g}$	SIM p. 16.20
$CRF = \frac{i \times (i+1)^n}{(i+1)^n - 1}$	SIM p. 17.5
$Bhp = \frac{Whp}{(E_p / 100)}$	SIM p. 17.8
$Whp = \frac{Q \times H}{3{,}960}$	SIM p. 17.8