

### ***Homework Assignment 4***

A furrow irrigation system has been evaluated. The critical input parameters are:  $S_o = .008$ ;  $T_{max} = 34$  cm;  $L = 340$  m;  $T_{mid} = 28$  cm;  $Base = 12$  cm; and  $Y_{max} = 13$  cm. A cylinder infiltrometer was used to measure the Kostiakov-Lewis parameters with the result that:  $a = 0.379$ ;  $k = 0.0084$  m/min<sup>a</sup>; and  $f_o = 0.00015$  m/min. Soil moisture samples were taken which indicated that  $Z_{req} = 10$  cm.

1. If the inlet discharge,  $Q_o$ , was 2 lps, how long will it take for the advance to reach 60, 100, 140, 200, 250, and 340 m?
2. What is  $\tau_{req}$ ?
3. What are the values of  $\rho_1$ ,  $\rho_2$ ,  $\sigma_1$ ,  $\sigma_2$ ,  $\gamma_1$ ,  $\gamma_2$ ?
4. If the flow is 2.4 lps,  $t_L$  is 168 min,  $t_{5L}$  is 52 min, and  $f_o$  is the same, what are the values of  $a$  and  $k$ ?
5. What was the Distribution Uniformity?
6. What was the Application Efficiency?