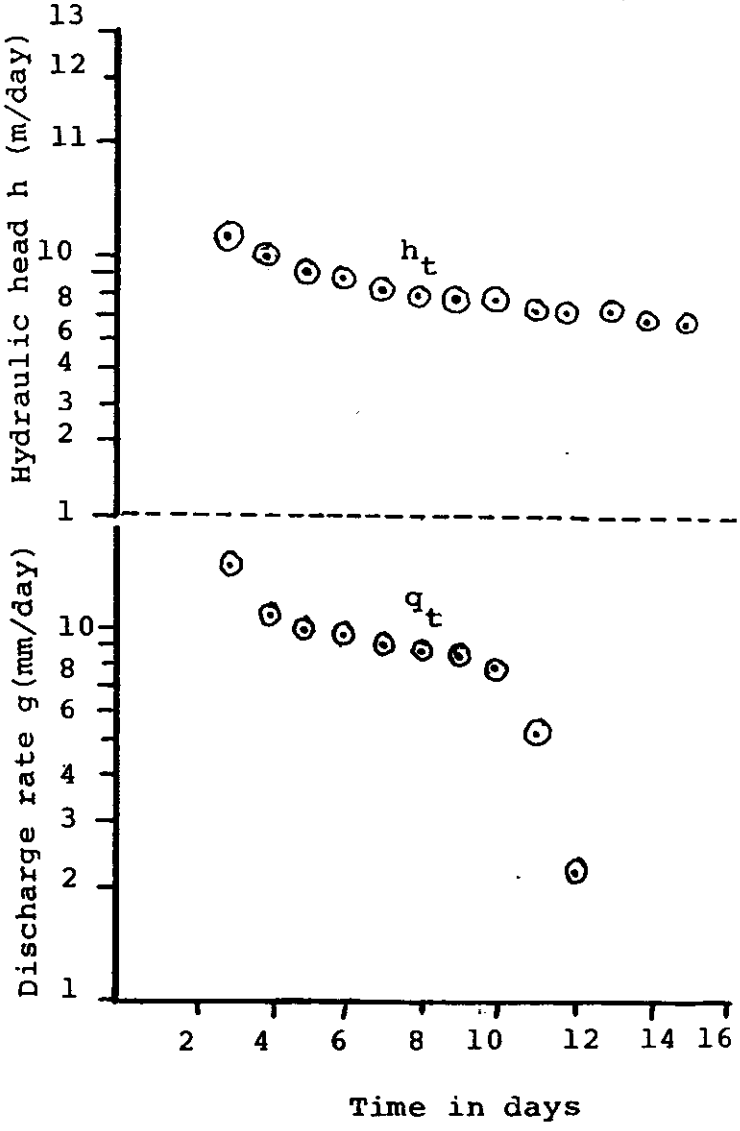


Fig.(21) The approxamtely constant relation between hydraulic head (h) and discharge rate (q) with time (Second year)

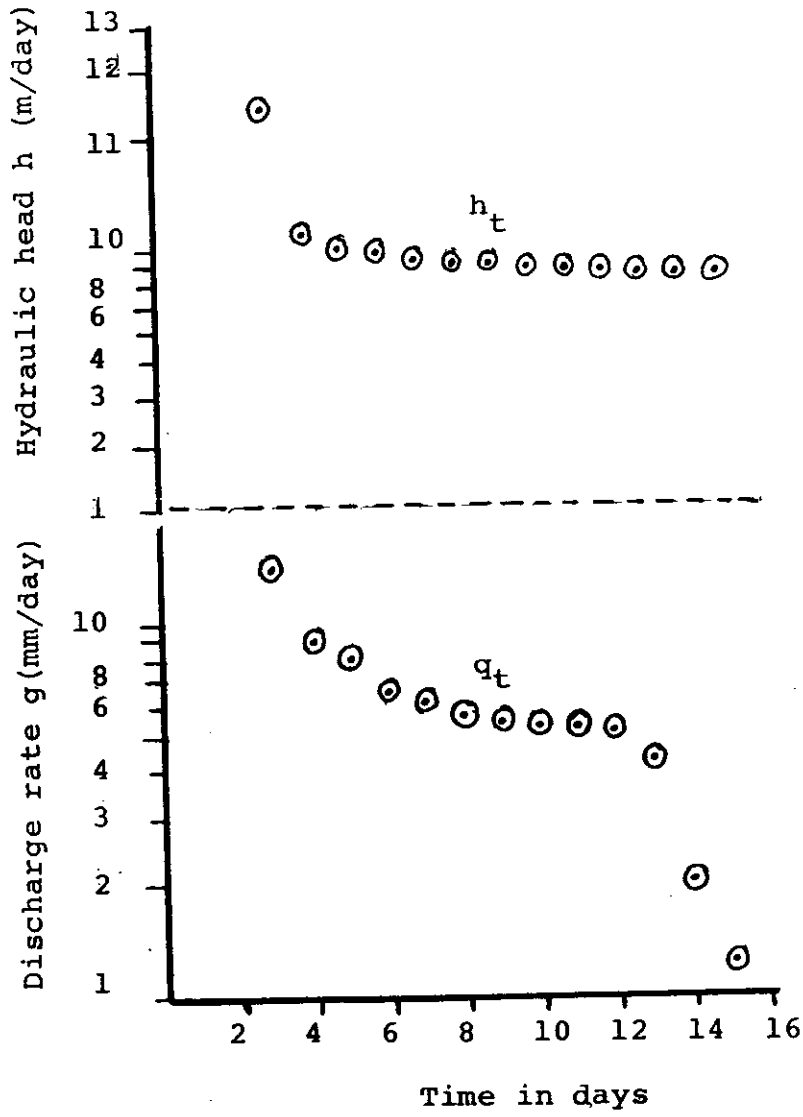


Fig (22) The approxamtely constant relation between hydraulic head (h) and discharge rate (q) with time (Third year)

because the low discharge is not in direct proportion to the low hydraulic gradient.

The calculated (t_A) according to $t_A = \frac{0.4}{a}$ equation (where "a" is the drainage intensity factor) is 4 , 5 and 6 days for the 1st , 2 nd and 3 rd years of study respectively. Deeleman and Trafford (1976)

Since low drainage intensity factor involves a high value of (t_A) the current data reflect a decreased performance of the drainage system gradually over the three years of the investigation.

4.4 Evaluating the performance of drain line

There are a number of parameters used for evaluating the performance of drain lines. These include (1) drainage intenisty factor (a) and (2) head loss fraction "he/h_{tot}" Dieleman and Trafford (1976).

I - Drainage intensity factor "a"

Drainage intensity factor (a) was caulated as follows :-

$$at = 2.3 \log h_o/h_t$$

or

$$at = 2.3 \log q_o/q_t$$

where(t)is the length of the observation period

This parameter describes the drainage at the non-steady state situation. The use of either the hydraulic head (h) or the discharge rate (q) is possible in calculating the space between the drains in the state of non-steady flow. In equations used in the steady state flow, both (h) and (q) should be known.

The drainage intensity factor "a" can be used in computing the ground water reservoir coefficient "j" which equals "1/a". The "j" factor is utilized in the formula drived by Kraijenhoff Van De Leur(1958)and wesseling 1980).

The drainage intensity factor can also be utilized in estimating the time period where there exists a linear relationship between h and q (i. e. t_A) from the equation $t_A = \frac{0.4}{a}$.

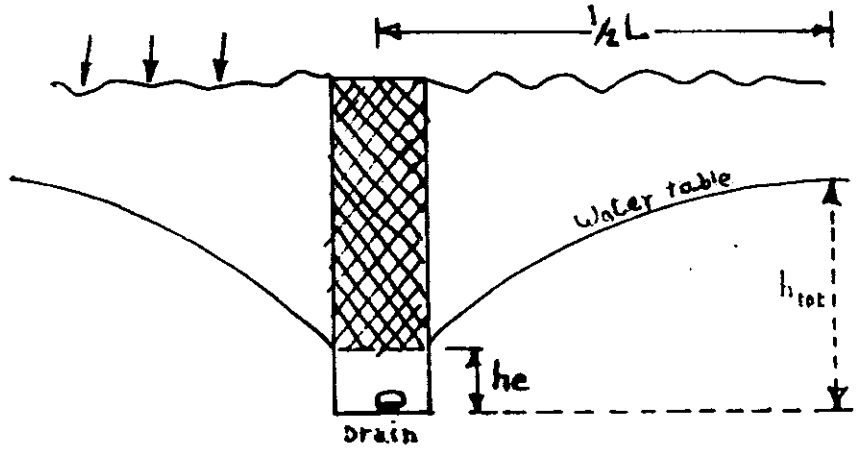
Table(17) shows the "a" values calculated for five plots through the three years of the study. The mean "a" value of the first year exceeds that of the second year by about one third, while it exceeds that of the third year by more than one half.

This indicates that the efficiency of the drainage system deteriorated with time.

Also the same table shows that the "a" values increased towards the main drain particularly in the first and second years.

II- Head loss fraction "ha/h_{tot}"

The head loss fraction is the rate between the entrance head loss "he" and the total head loss "h_{tot}", expressed as a fraction.



Schematic representation of "he" and "h_{tot}"