

The Nicholson-Bailey equations of parasitoid-host interactions are as follows.

$$H(t+1) = b \cdot H(t) \cdot [e^{-a \cdot P(t)}] \text{ for hosts}$$

$$P(t+1) = c \cdot H(t) \cdot [1 - e^{-a \cdot P(t)}] \text{ for parasitoids}$$

$H(t+1)$ = number of hosts in the next generation ($t+1$)
 $P(t+1)$ = number of parasitoids in the next generation ($t+1$)
 a = search efficiency of the parasitoid
 c = number of parasitoid offspring resulting from an attack of a host
 b = per capita birth rate of hosts

1. If $H(t)$, $H(t+1)$, and $P(t+1)$ all have units of organisms per meter along a transect in a potato field, what must be the units of search efficiency a _____
 offspring per attack c _____

2. Complete the following table.

$P(t)$	$H(t)$	a	c	$P(t+1)$
10	100	4%	2	_____
10	100	8%	2	_____
10	100	16%	2	_____

3. In words, what happens to the number of parasitoids in the next generation when efficiency doubles?

4. If t has units of days, what units will the quantity ΔP have ?

$$\Delta P = \frac{P(t+1) - P(t)}{t}$$

5. For a density of 100 potato nematode (hosts) per square meter, which is the more effective means of increasing parasitoids, doubling the parasitoid efficiency or doubling c by increasing the survival of parasitoid offspring ?