

$$\partial_t L = \alpha_1 \left(\frac{\delta_1 + Q}{k_{PL} + Q} \right) - \gamma_1 A \frac{L}{k_{LD} + L} - k_1 (P_m - P)L + k_2 P + \nabla^2 L \quad (1)$$

$$\partial_t P = k_1 (P_m - P)L - k_2 P - 2k_3 P^2 + 2k_4 Q \quad (2)$$

$$\partial_t Q = k_3 P^2 - k_4 Q \quad (3)$$

$$\partial_t H = \alpha_2 \left(\frac{\delta_2 + Q}{k_{PH} + Q} \right) - \gamma_2 H + D \nabla^2 H \quad (4)$$

$$\partial_t A = \alpha_3 \frac{\delta_3 + H}{k_{HA} + H} - \gamma_3 A \quad (5)$$