$$\frac{d\mathrm{SOM}}{dT} = (\sigma_S + \sigma_\varepsilon \bar{\varepsilon})\,\mathrm{SOM} \qquad \frac{d\mathrm{BIO}}{dT} = (\sigma_B + \sigma_\varepsilon \bar{\varepsilon})\,\mathrm{BIO}$$

$$y_t = y_{\max}\left(1 - \exp\left\{-\frac{1}{N_{\mathrm{req}}}(F_t + \alpha\mathrm{SOM})\right\}\right)\left(1 - \beta\exp\left\{-\gamma\mathrm{BIO} - (1-\gamma)\left(\frac{P_t}{P_{\mathrm{req}}}\right)\right\}\right)$$

$$F_t = (1 - \kappa_{\mathrm{Profit}} - \kappa_{\mathrm{Other}})\,F_{t-1} + \kappa_{\mathrm{Profit}}\,F_{\mathrm{OPT}} + k_{\mathrm{Other}}\,\langle F_{t-1}\rangle$$

$$P_t = (1 - \kappa_{\mathrm{Profit}} - \kappa_{\mathrm{Other}})\,P_{t-1} + \kappa_{\mathrm{Profit}}\,P_{\mathrm{OPT}} + k_{\mathrm{Other}}\,\langle P_{t-1}\rangle$$

$$F_{\mathrm{OPT}}, P_{\mathrm{OPT}} = \max_{F\in[0.5\cdot F_{t-1},1.5\cdot F_{t-1}],P\in[0.5\cdot P_{t-1},1.5\cdot P_{t-1}]} \mathcal{P}(\hat{p}_t^M)$$

$$p_t^M = p_{i-1}^M\left(1 + \frac{D-Y}{Y}\right) \qquad p_0^M = \mu\frac{(p_F F_0 + p_P P_0 + p_{\mathrm{other}})}{y_0}$$