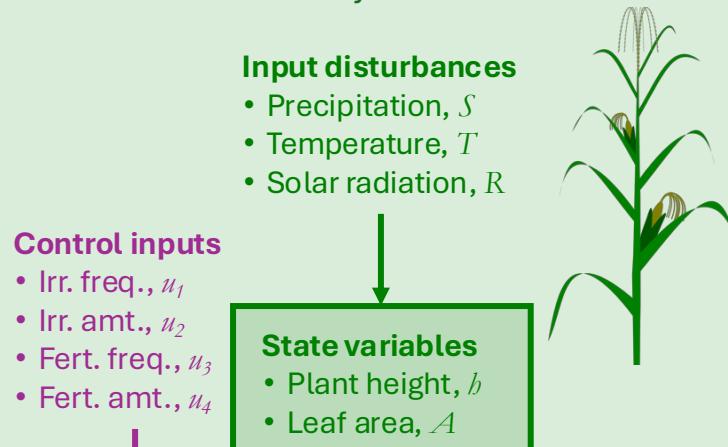


Optimizing Irrigation & Fertilizer Strategy via Crop Model + Genetic Algorithm

Crop as Control System | Irrigation & Fertilizer as Inputs

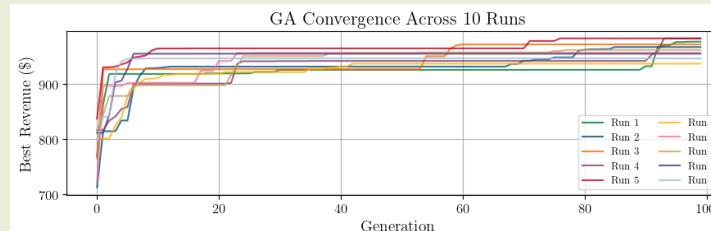
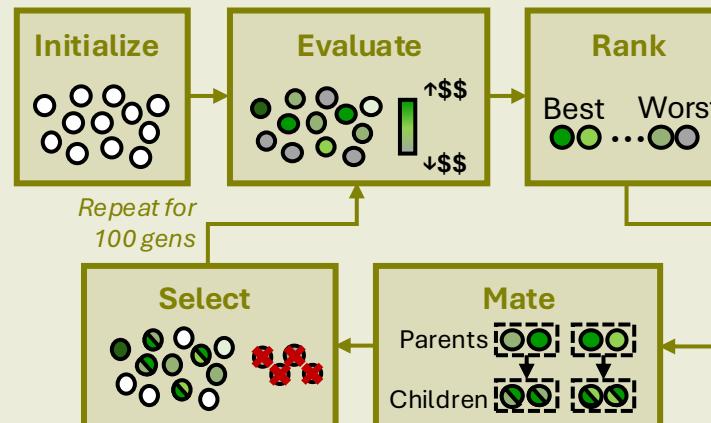
- Growth modeled with coupled ODEs
- Corn as case study



Delayed nutrient absorption
via FIR convolution
Cumulative stress tracking
via EMA filtering

Find Optimal Irrigation & Fertilizer Inputs with Genetic Algorithm Optimization

- Thousands of simulations of crop growth over a season per GA run
- Perform 10 GA runs



Results

- 16% higher revenue**
 - \$999 vs. \$859 per acre
- 17% less irrigation water used**
 - 15 vs. 18 inches
- 32% less fertilizer used**
 - 307 vs. 450 lbs per acre

