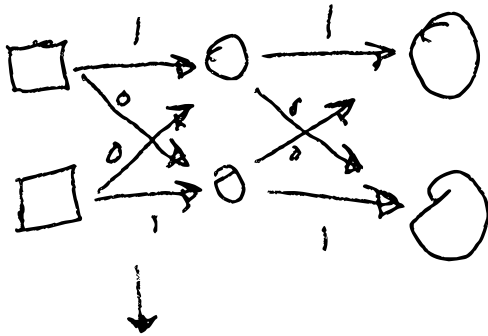
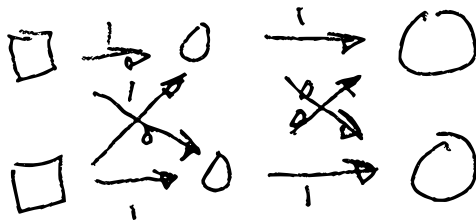


First loci to trait layer should
code dominance or epistatic relations?



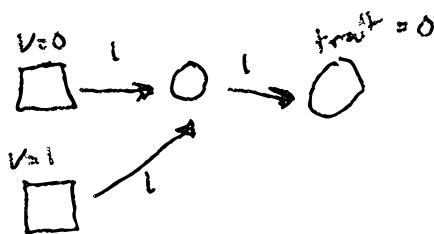
$$\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} \quad \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$



$$\begin{bmatrix} 2 \\ 4 \end{bmatrix}^+ \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix} \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 2+0 \\ 2+4 \end{bmatrix} = \begin{bmatrix} 2 \\ 6 \end{bmatrix}$$

$$\begin{bmatrix} 0 & 4 \end{bmatrix} \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 0 \\ 4 \end{bmatrix}$$

Dominance relationship with the network



Recessive traits
just have a
value of zero

If two loci affect one trait, then can treat as diploid

0, 0 \rightarrow homozygous recessive

0, 1 } \rightarrow heterozygous
1, 0

1, 1 \rightarrow homozygous dominant

Note, need to change allele value assumptions. Values now must be either 0 or 1. Traits of

0 are recessive phenotype, and

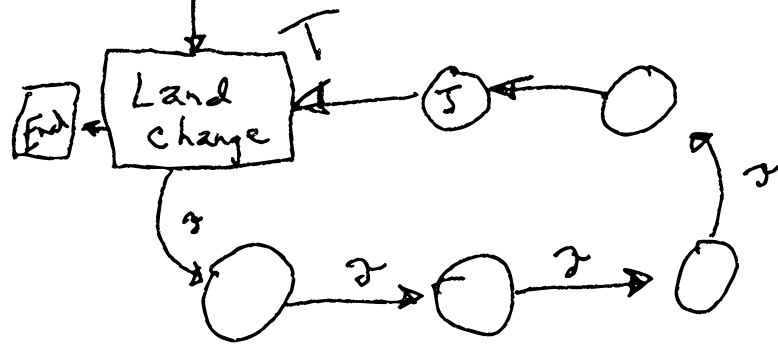
>0 dominant phenotype.

Allow nine-traits to seed

binary?

Initialize

Land change freq: T
Rest change freq: r



for x in G
where
 $x \leq T$

- Age (egg, larva, instar, adult)
- Move (short and long? Pairs more?)
- Eat (what age? how much?)
- Reproduce (if adult)
- Death (if adult, or fail to eat, or pesticide)

Movement

In a J , move $M \sim \text{Poisson}(\lambda_m)$ times.

Each time, go $d \sim \text{Poisson}(\lambda_r)$ cells.
(Short & long distance?)

Age

How many J for egg, larva, and each instar phase (start out generic, just a number with a rule for which numbers can move and which can reproduce?)

Eat

What age eats? Should deplete a fraction of each cell, based on a trait value and the crop on the cell?

- Scale? Each cell a hectare?

Reproduce

Produce Poisson (λ_R) offspring,
with λ_R based on a trait?

Must be age $> R_A$ to
reproduce?

Offspring become eggs on same
cell as parent
- sex necessary?

Death

- All adults of a given age
die
- All pests that don't eat
enough die
- Pests accumulating more
biopesticide than they can
resist die

- Keep a 'Tcount' that resets when it hits T
- J is just each loop
- Count to 'gens' in loop.
- if ($Tcount = T$), then rotate land and pesticide application.
- Need a pest column for holding required feeding needs, pestree tolerance, which should be the same for all individuals
- What Qzts to collect?