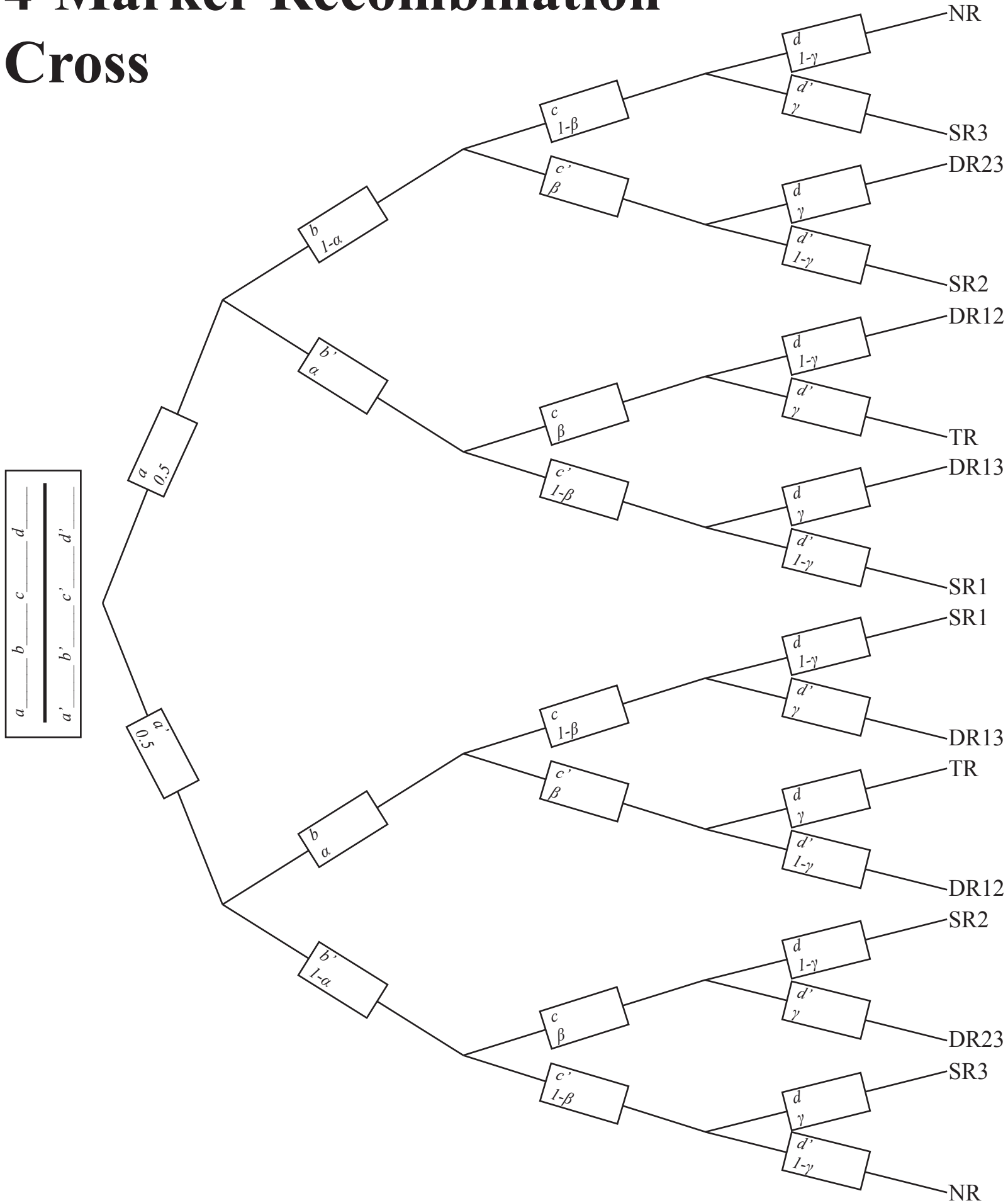


4-Marker Recombination Cross



Genotypes

NR _____ $p =$ _____

SR3 _____ $p =$ _____

DR23 _____ $p =$ _____

SR2 _____ $p =$ _____

DR12 _____ $p =$ _____

TR _____ $p =$ _____

DR13 _____ $p =$ _____

SR1 _____ $p =$ _____

SR1 _____ $p =$ _____

DR13 _____ $p =$ _____

TR _____ $p =$ _____

DR12 _____ $p =$ _____

SR2 _____ $p =$ _____

DR23 _____ $p =$ _____

SR3 _____ $p =$ _____

NR _____ $p =$ _____

Known Map Distances:

Interval 1 (a ___ to b ___): _____ map units / 100 = _____ $= \alpha$

Interval 2 (b ___ to c ___): _____ map units / 100 = _____ $= \beta$

Interval 3 (c ___ to d ___): _____ map units / 100 = _____ $= \gamma$

To determine gamete classes and their expected proportions:

- 1) Write the alleles on the two parental chromosomes in the blanks $a-b-c-d/a'-b'-c'-d'$ at the root.
- 2) Copy those alleles into the boxes with the same letters on the branches.
- 3) Write the known map distances for the intervals in the box to the right, and calculate α , β and γ .
- 4) Write the values of α , $(1-\alpha)$, β , $(1-\beta)$, γ and $(1-\gamma)$ in the boxes where indicated.
- 5) For each tip on the right, trace from root to tip, writing down the alleles encountered along the way in the blanks on this page. This gives the genotype of that gamete class.
- 6) For each tip on the right, trace from root to tip, multiplying all numbers along the way. This gives the expected proportion p for that gamete class.
- 7) Each change of direction is a recombination event. Classes are labeled NR (non-recombinant) SR (single-recombinant, interval 1/2/3) DR (double-recombinant, intervals 1/2/3) and TR (triple-rec.)
- 8) If doing a χ^2 test, multiply each p by the total number of progeny observed to get expected values.