**A spatially-structured stochastic model**

Initial conditions used in most simulations are as follows. All individuals are randomly as- signed in the spatial grid. The population was initialized so that 1/3 of the sites were occupied by uninfected trees. Into this tree population, virus-free and virus-infected fungi, with the same vc type frequencies, were randomly assigned to tree-occupied sites (250 sites for each).

The horizontal transmission rate was estimated from the initial vc type dis- tribution by calculating the average transmission probability between each pair of individuals in the population.

**Viruses inhibit sexual reproduction. However clonal (combo of asexual and sexual) are generally equivalent to asexual populations.**

**Demography of American chestnut populations: effects of a pathogen and a hyperparasite**

**Good stuff to put in background info:**

* he blight pathogen, *Cryphonectria parasitica* (Murrill) Barr, was intro- duced into the United States from Japan (Milgroom 1995; Milgroom *et al*. 1996) around 1904 (Merkel 1905) and rapidly spread throughout the range of the American chestnut, *Castanea dentata* ( Marsh.) Borkh.
* Blight-infected branches are killed when a canker girdles the stem disrupting phloem transport and cambrial growth.
* Hypovirus infec- tion often reduces canker expansion rates (Anagnostakis & Waggoner 1981), which provides more time for infected branches to produce wound callus tissue that can wall off the infection. If the callus successfully halts canker expansion, branch longevity is increased.
* American chestnut, *C. dentata*, was a dominant over- storey species in hardwood forests of the eastern United States of America prior to the introduction of blight (Day & Monk 1974; Karban 1978; Russell 1987). After the spread of *C. parasitica*, oak (*Quercus* spp.), red maple (*Acer rubrum*) and hickory (*Carya* spp.) became the dominant overstorey tree species (Keever 1953; Stephenson *et al.* 1991). Today, chestnuts con- tinue to be an important understorey species because of sprouts produced by extant tree root systems (Keever 1953; Russell 1987; Stephenson *et al*. 1991).

Small chestnuts may not benefit much from the presence of the hypovirus and thus saving them may have less of a benefit for the grove health as a whole