# Statistical model

A species of invasive insect is making its way across Vermont. The insects injure pine trees by crawling inside the trunk and eating the insides, resulting in a weaker tree. However, some trees are more resistant to the insects than others!

- Suppose each pine tree is able to resist the insects with unknown probability $p$, independent of other trees.
- Healthy pine trees that resist the insects will produce pine cones independently according to a Poisson distribution with unknown mean $\lambda_1$.
- Unhealthy trees unable to resist the insects will produce pine cones independently according to a Poisson with a different unknown mean $\lambda_2$.

An ecologist studies a sample of 100 pine trees in Vermont and for each tree, observes its health status and number of pine cones produced.

**Identify a statistical model for this process.** *Hint: there are multiple random variables to keep track of!*