In the follows, we examinate a tomato species data from Holt eta al. The data consist of week count Yp of the number of infected plants over a time intervals of seven days aproximatly. To link the data to the SLI-SI dynamics, we specify the following Negative Binomial observation model:

Yp~NegBin(\lambda\_t,phi)

\lambda\_t = \int^{t}\_{0} b \*L\_p (s) ds.

We aim to estimate beta\_p, r\_1, r\_2, b, beta\_v, theta, and the vector population. To do this, we specify the following priors

beta\_p ~ Normal(0.05,0.03)

r\_1 ~ Inv-Gamma(2.005,0.01005)

r\_2 ~ Inv-Gamma(2.005,0.01005)

b ~ Inv-Gamma(3.125,0.159375)

beta\_v ~ Normal(0.003,0.003)

C ~ Uniform(50,100)

theta\_1 ~ Normal(0.4, 0.05)

Considering the nature of B. Tabacci, we consider the following initial condition. First, we introduce 1 000 plant at begin of harvest season. We proposed 65 infected latent plant and one infectiuos plant. In papers [][], they deduce a proportion of vectors per plants of 50 to 100 vectors. We use this information to estimate the total vector population, and take a initial vector population as 60 000 susceptibles vectors and 1000 infected vectors, the remain of vector we introduce in the Dv compartment.

The parameters that we estimate are beta\_p, r\_1, r\_2, b, beta\_v, theta, and C, using the default Holt parameter value as mean of the priors.

In our model beta\_p, beta\_v represents the infection rates. We postulated for theses parameters normal distributions priors since .....

The replanting rates r\_1, r\_2 are proposed as inverse gamma distribution, because we analyze the time of incubation/infection of the disease in the plants of the crop, and we replant these latents/infected plants.

Similarly, we proposed a inverse gamma for the incubation time period of the disease.

For last, the propotion of vectors that arrivals susceptibles or infected, theta, we postulated a normal distribution prior since it is impposible know the exactly proportion of susceptible vectors or infected.