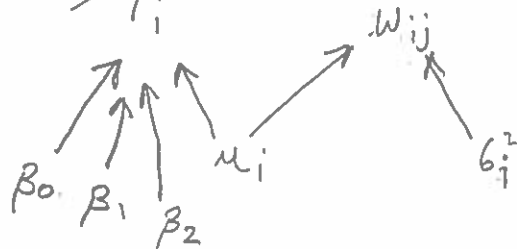


4.

$$X_i \text{ --- } \Rightarrow Y_i$$

$Y_i = \text{counts on plot } i$

$X_i = \text{Cover on plot } i$



$W_{ij} = \text{soil water replicate } j \text{ on plot } i$

$$[\underline{\mu}] [\underline{\beta}, \underline{\mu}, \underline{G^2} \mid \underline{W}] \propto \prod_{i=1}^{100} \prod_{j=1}^5 [Y_i \mid e^{\beta_0 + \beta_1 \mu_i + \beta_2 X_i}]$$

— underline indicates  
vectors or  
matrices

$$X [W_{ij} \mid \mu_i, G_i^2]$$

$$X [\mu_i] [G_i^2] [\beta_0] [\beta_1]$$

$$Y_i \sim \text{Poisson}(e^{\beta_0 + \beta_1 \mu_i + \beta_2 X_i})$$

$$W_{ij} \sim \text{gamma}\left(\frac{\mu_i^2}{G_i^2}, \frac{\mu_i}{G_i^2}\right)$$

$$G_i^2 \sim \text{uniform}(0, 100)$$

$$\beta_0 \sim \text{normal}(0, 10000)$$

$$\beta_1 \sim \text{normal}(0, 1000)$$

$$\beta_2 \sim \text{normal}(0, 1000)$$

$$\mu_i \sim \text{uniform}(0, 100)$$

← could be  
inverse  
gamma on  
 $G_i^2$



all vague priors scaled  
properly