$$p(r|Y,N) \propto p(Y=y|r,N)p(r)$$

$$\propto r^y(1-r)^{N-y} \times 3r^2$$

$$\propto r^{y+2}(1-r)^{N-y}$$

$$= r^{\alpha'-1}(1-r)^{\beta'-1}$$

which suggests Beta density values $\alpha' = y+3$ and $\beta' = N-y+1$.

For the prior to be proportional to r^2
$\alpha = 3$, $\beta = 1$