

Breeding Value for parent S with genotype G_2G_2 :

(6)

$$BV_{22} = 2(\mu_{G_2G_2} - \mu_{G_1G_2})$$

$$\mu_{22} = pd - qa$$

$$BV_{22} = 2(pd - qa - [(p-q)a + 2pqd])$$

~~$$= 2(-pa + p)$$~~

$$= 2(pd - qa - (p-q)a - 2pqd)$$

$$= 2(pd - \cancel{qa} - pa + \cancel{qa} - 2pqd)$$

$$= 2(pd - pa - 2pqd)$$

$$= 2(-pa + \cancel{pd} - 2pq\cancel{d})$$

$$= 2(-pa + (\cancel{p} - 2pq)\cancel{d})$$

$$= 2(\cancel{-pa} + \cancel{p}(1 - 2q)\cancel{d})$$

$$= 2p(-a + (1 - 2q)d)$$

$$= -2pa - (1 - 2q)d$$

$$= -2p(a + (q-p)d) = -2p\alpha$$

$$\left. \begin{array}{l} p + q - 2q \\ = p - q \end{array} \right\}$$