Changes in Variance

- Additive locus ⇒ only additive genetic variance:

Base population: $V_G = 2p_0q_0a^2$

Within Line with allele frequencies $\bar{p}$ and $\bar{q}$

$$V_{\bar{G}} = \underbrace{2\bar{p}\bar{q}}_{\text{genotype frequency of heterozygotes}} a^2 = 2p_0q_0(1-F)\cdot a^2 = \underbrace{V_G}_{\text{additive genetic variance in base population}}(1-F)$$

- New variance component: between Lines

$$\text{var}(M) = \sigma_m^2 = 4a^2\sigma_q^2 = 4a^2p_0q_0F = 2\cdot F\cdot V_G$$

- Total additive genetic variance:

Between Line	$2F\cdot V_G$
Within Line	$(1-F)\cdot V_G$
Total	$[2F+(1-F)]V_G = \underline{(1+F)V_G}$