

4. Resistance of B' to selection.

Selection for plant color for three generations has not altered the conversion-type pattern of inheritance followed by B'. A pl series using a uniform B pl parent (color grade 5 to 6) as the common recurring parent and a Pl series using a uniform B Pl parent (grade 7 to 8) were developed as light and dark lineages through three generations of selection. Selections were made in progenies of 30 or more individuals at each stage for each lineage and series. These lineages were planted in a randomized coded pattern and were graded for plant color without knowledge of pedigree. Cob color also was graded in the Pl series.

Lineage	Grade						Average grade
	0	1	2	3	4	5	
pl light, plants	26	84					0.76
pl dark, plants	15	110					0.88
Pl light, plants			6	78	27		3.19
Pl dark, plants				52	55	10	3.64
Pl light, cobs		30	77	4			1.77
Pl dark, cobs		23	87	5			1.84

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5. Classification for B expression.

The gross tissues, husks, sheaths, and tassels, are useful in virtually any background to distinguish B from lower alleles but not to distinguish the lower alleles from each other. The bar of color at the base of the glumes in the tassel will permit distinction between b, which shows no bar, and higher alleles, all of which show at least bar color (excluding the mutable, B^V, which is phenotypically b except in sectors with full B expression). The cob, however, has several advantages over other tissues. It is protected from direct environmental influences (including bleaching and leaching), is the structure normally harvested and stored, and is not excessively fragile or bulky. The only major requirement for cob color expression is the purple (Pl) factor. Cob color grades give consistently better results than other gross tissues in predicting progeny phenotypes where distinction between B and B' and between different levels of B' is desired. Alleles such as B^b, which effect pigment synthesis in the tassel glume bar and parts of the culm, also elicit weak pigmentation in the hard, smooth parts of the cob, so they are distinguishable from b here as well as elsewhere.

The most convenient expression of B and its alleles, however, is in the coleoptile. Seedlings of B Pl constitution develop intense coleoptile color but so do R^r or r^r seedlings in the absence of B, so the genetic background for B classification should be R^S Pl or r^S Pl. In heated sandbenches, B color is expressed fully within two weeks from planting if sunlight has been adequate during the last few days. The seedling expression of B^b and B' is largely restricted to occasional tiny streaks on the coleoptile and these may be absent on some seedlings. Seedlings of b constitution are completely green in the R^S Pl background.

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