

9. Nature of the grass coleoptile and the ac, hc, and "bikeel" genes.

Studies on hc gene expression and information gathered on the ac and bikeel mutants suggest the construction of hypothetical stepwise stages involved in the evolution of the coleoptile from one or two leaves in Zea mays.

Thus ac action allows a green leaf blade like expression on one side of the coleoptile due to marginal meristematic activity while a spur-like outgrowth on the first true leaf of the bikeel mutant represents an intermediate stage. Bikeeled and hornlike coleoptiles represent still another stage toward the normal coleoptile. A single outgrowth may be considered as equivalent to an underdeveloped leaf blade. It may be underdeveloped because of altered position and reduced growth activity of the basal meristem regularly present at the base of the normal leaf blade above the collar region.

Thus, the coleoptile is proposed to be an incompletely developed leaf which has evolved via fusion and modification to undertake a protective function. The question remains as to the number of leaves which go to make up the coleoptile. At present, it may be suggested that there are two leaves fused along marginal sheath regions. Such a suggestion is supported by (1) the presence of a leaf blade in ac stocks along margins on one side, (2) the frequent occurrence of two hornlike leaf blade rudiments in hc stocks, and (3) the presence of more than two regular vascular strands in the "bikeel" plants from Bianchi.

B. S. Sidhu
H. L. Everett

DE KALB AGRICULTURAL ASSOCIATION, INC.
DeKalb, Illinois

1. Comparison of normal vs. restored commercial hybrids.

Data below compares the performance of normal vs. restored (R) version of commercial hybrids for yield, moisture, and stalk quality (the lower the number the better the quality). These results are from 7x7 latin squares in which each entry appeared seven times. Each latin square was replicated four (three *) times. These figures, therefore, are the average of twenty-eight (twenty-one *) 2x5, four kernel per hill plots.

<u>Hybrid</u>	<u>Maturity</u>	<u>Yield bu/acre</u>	<u>Moist. %</u>	<u>Stalk Qual. Rating</u>
# 1	400	95.0	26.4	15.8
# 1 R		100.3	27.3	15.6
# 2	400	96.7	24.8	9.7
# 2 R		103.8	25.7	10.3
# 3	400	95.7	28.8	9.7
# 3 R		105.7	27.7	9.1
# 4 *	400	98.2	23.6	9.9
# 4 R *		97.0	21.9	10.0