

differences was non-significant. Analysis of response of oat sections to corn tips and corn sections to exogenous IAA indicated that differences due to females or due to males were non-significant. These results suggest that the genetic variability of coleoptile elongation after six days in darkness is primarily non-additive genetic variance. Magnitude of genetic variability for auxin production (as assayed by oat coleoptiles) and responsiveness to auxin (as determined by exogenous IAA application to corn coleoptile sections) is insufficient to be detected by these experiments.

R. H. Moll
C. S. Levings, III

NORTHWESTERN UNIVERSITY
Evanston, Illinois

1. Diffuse: a dominant pigment inhibiting gene.

A. Distribution of Diffuse in indigenous populations of Peru

At the time of the initial report on Diffuse (Brink and Greenblatt, Jour. of Hered. 1954) the gene was known to have come from Peru and was thought to be rare. A recent (January 1968) search for the Diffuse (Idf) gene in Peru has disclosed that it is not rare, but is rather widespread throughout the country. In Table 1 are listed the Districts of Peru in which the mutable form of the gene was identified. The principal source of this information was the collection of indigenous races of maize kept at the Universidad Agraria, La Molina, Peru. In addition, a search was made of rural market places, farmers' seed supplies and phenotypes of plants currently being grown.

The recovery of 23 distinct sources from 9 districts represents a minimum estimate of the distribution of Idf. Since only the mutable form of the gene in a colored pericarp background is unique enough for absolute recognition by phenotype alone, the two other forms or states of Idf, fully active and relatively inactive would have gone undetected. The disproportionately high number of locations in the Ancash Districts most likely means a more intense collecting from this region rather than a higher gene frequency. The single collection from Puno may be erroneous. The ear type expressing the Idf mutable phenotype, I was told, does not correspond to the races known from Puno and is most likely a mislabeling of the museum sample.

B. Field search for Diffuse in Peru.

While in Peru, an effort was also made to discover the presence of mutable forms of the gene by searching during or after the time of pollination for stripes on plants with colored stems. In the Cuzco region, while 97% of the plants exhibited intense plant color, no striped plants were found, nor were any totally green plants (the fully active form of Diffuse) found. The same was true for the Huancayo District--96% full pigmentation and no striping and no totally green plants.

Table 1
Districts of Peru where the Diffuse gene has been identified

District	Map locations*	Number of locations
Ancash	9° - 78°	13
Apurimac	14° - 73°	1
Cajama	7° - 79°	1
Huancavelica	13° - 75°	1
Huanuco	9° - 74°	2
Junin	11° - 75°	2
La Libertad	8° - 79°	1
Piura	5° - 80°	1
Puno	16° - 70°	1

*Degrees latitude south of the equator - degrees longitude west of Greenwich

In the Ancash District this was not the case. Totally green plants constituted a large proportion (approx. 20%) of one population examined. The mutable form of Idf was found on only one plant. These results from Ancash were unexpected, based upon laboratory experience. The most frequently found state of Idf is the mutable form, unless selection for other states is made. The fully active form is highly unstable, progressively reverting to the mutable form in subsequent generations. It was found that the farmers in Ancash region prefer two types of ears--"Blanco" (white) and highly colored (every pericarp color gene known). One way to have "Blanco" is to lose the major dominant pigment conditioning genes (but they are almost always present), or to select for a dominant pigment inhibitor--the fully active form of Diffuse. Such a selection by the farmer would account for the high frequency of fully active Diffuse.

Irwin M. Greenblatt

2. A possible selective advantage of plant color at high altitudes.

Field observations and temperature measurements of three high altitude corn fields in Peru have disclosed the following (statistical analysis of the temperature measurement is not as yet complete):

1. There seems to be a very high correlation of both (a) high frequency of plant color, and (b) low ear and plant size with low temperature