Table 3
Comparison of knob constitution of selected inbred lines

Line	Position and size of each knob					
	2L	3L	5L	$6L_3$	7L	$8L_1$
CI 21			l	t	l	m
# 34 of Jarvis			l	t	m	m
# 216 & # 227 of Indian Chief			l	t	m	s
NC 45	l		t	t	l	
# 78 of Jarvis	l		l	t	l	
# 165 of Indian Chief		s	t	t	l	
# 119 & # 172 of Indian Chief		s	l	t	l	

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1. Inheritance and nitrogen metabolism of a lutescent maize mutant.

Characterization of a recently reported (MNL 38:116) lutescent mutant from the viewpoint of classification and expression, inheritance information and nitrogen metabolism is being investigated. Classification is generally good, but expression has been shown to be light and/or temperature sensitive, being much better under field conditions than in the greenhouse. Viability is rather good, but seed set and vigor are only fair.

The mutant was crossed with several standard inbred lines; selfs of these crosses produced 269 normal green and 81 mutant plants. Crosses were made with Dr. E. G. Anderson's waxy-marked translocation series involving all chromosomes. All F_2 populations showed normal 3:1 segregation except those involving wx 5-9c and wx 8-9d from which the follpwing data were collected. Waxy seeds of the 5-9c translocation material gave 38 normal: 0 mutants; non-waxy seeds gave 3 normal: 1 mutant. Waxy seeds of the 8-9d translocation gave 29 normal: 2 mutant; non-waxy seeds gave 12 normal: 0 mutant. These data suggest that the gene is located on chromosome 5.

Embryo-cultured mutant seedlings grown under sterile conditions on an agar medium with mineral salts (including nitrate) and sucrose show good mutant expression under artificial lighting. Chlorophyll content was determined spectrophotometrically. Mutants contained roughly one-half as much chlorophyll, per fresh weight, as normal plants under the same conditions. The addition of ammonium ion, urea, or one of the common naturally occurring amino acids to the medium resulted in an increase in chlorophyll content of the mutants to various degrees - up to 44% above that of mutant controls. The greatest amount of greening resulted with the addition of L-alanine.

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1. Evaluation of root systems as measured by resistance to uprooting.

In the maize breeding program carried out at the University of Pretoria, South Africa, it has become increasingly apparent that root systems are of great importance in maize to be grown in a relatively dry climate. Casual observation had led us to believe that a good root system was strongly correlated to yield, but in order to test this hypothesis, it was necessary to devise some method of evaluating the root system of a plant.

An apparatus to measure the pull necessary to uproot individual plants was designed and found to be practical in field trials. The apparatus consists of a lever, mounted on two legs, which exerts a vertical pull (measured by an attached scale) on a clamping head. The head is clamped around the stalk of the plant to be pulled as close to the ground as possible and then a steady pressure exerted on the lever until the plant is uprooted. The maximum pull needed to uproot the plant is then read from the scale.

Since resistance to uprooting would be expected to vary for different soil types, moisture conditions, and plant growth stages, all preliminary trials were conducted