2. A new cycle of recurrent reciprocal selection with maize varieties that combine well.

Although a reciprocal recurrent selection program was started some time ago, no lines of outstanding merit could thus far be obtained from the local varieties chosen for their adaptability to the local hot and dry climatic conditions. A large number of varietal crosses was, however, compared in a yield trial, and fairly high yields in some cases showed good combining ability between certain varieties. In this respect it was noticeable that the highest yields came from dent-flint crosses. The two best combining white and yellow varieties were chosen for a new recurrent reciprocal selection cycle.

H. C. Kuhn
F. J. Dijkhuis

3. Hybrid maize seed production.

Mr. C. Kuhn resigned from the Union of South Africa Department of Agriculture during September 1958 to take up the appointment of maize breeder to the Golden West seed company at Klerksdorp. Considering that hitherto crop breeding work has been almost entirely in the hands of the Department of Agriculture, this is a step in the direction followed in the United States where, it is understood, mainly fundamental work is carried out at the experiment stations, and private initiative furnishes hybrid seed under well-trained guidance.

In South Africa the experiment station at Pretoria, Bethlehem and Potchefstroom conduct the initial breeding work and hands over to the Maize Control Board the inbreds, recommended for large-scale production. The Board has a team of officers who (a) arrange contracts for the multiplication of inbred and single cross seed and (b) certify the hybrid seed produced by its agents who are either seedsmen or cooperative societies.

J. Sellschop

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1. Breeding for sugar in the stalk: correlation between refractometrica reading and resistance to Diplodia and Gibberella Zea.

Nine different hybrids of medium maturity period were elected for

this study: four were standard double crosses and five were experimental single crosses of the breeding program to increase sugar in the stalk at and after maturity. Three of the last ones were expected to have high refractometrical reading after maturity. Each hybrid was planted in a single row. Ten days after pollination six plants of each hybrid were inoculated with Diplodia and another six plants were inoculated with Gibberella ("tooth pick" technique). This was done again 15 days later and 30 days later after the first inoculation. The total number of plants inoculated with Diplodia and Gibberella were 36 in each hybrid.

On November 28 refractometrical readings were made on each inoculated plant and on December 1 the same plant was cut from base to top to observe the degree of damage caused by the inoculation. Scores for degree of infection were from zero (no damage) to five (five or more internodes showing the infection). Plants completely killed by infection were also scored five. Fractions of internodes showing infection were scored as corresponding fractions of 1. Correlation analyses for pairs of the individual plant values (for refractometrical reading and infection scores) are shown in Table I. This high correlation between resistance to these two diseases of the stalk and roots confirm previous observations.

Table I

Hybrid		Coefficient of correlation for each hybrid	
Standard double cross	362	-0.49	
" " "	363	-0.62	
" " "	364	-0.78	
" " "	365	-0.66	
Exp. single cross	366	-0.57	for r: ± 0.425 P: 0.01
" " "	367	-0.56	
" " "	368	-0.73	
" " "	369	-0.81	
" " "	370	-0.51	

Correlation coefficient of the hybrid means for refractometrical reading and score of infection, r = 0.897, P = 0.001

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1. Production and testing of pollen restoring inbreds.

Many of the standard Northeastern and Northcentral corn inbreds