

The  $F_2$  results do not show a significant deviation from a 1:2:1 ratio while the testcross fits a 1:1 ratio consisting of parental classes only. Both populations suggest that the two inbreds differ at only one locus with regard to pericarp and cob color. It is suggested that the original inbred Q703 carried  $\underline{P}^{CW}$  and the derived inbred Pa W703 has  $\underline{P}^{WR}$ . This would have involved a mutation of both the pericarp and cob color component of  $\underline{P}^{CW}$ , the pericarp component from dominant to recessive and the cob color component from recessive to dominant, to produce  $\underline{P}^{WR}$ .

R. I. Brawn

### 3. T1-2c - P linkage.

Testcross data of a plant heterozygous for T1-2c and  $\underline{P}^{WR}-\underline{P}^{WW}$  indicates about 20 per cent crossing over between them:

| <u>T1-2c <math>\underline{P}^{WR}</math></u> | <u>T1-2c <math>\underline{P}^{WW}</math></u> | <u>+ <math>\underline{P}^{WR}</math></u> | <u>+ <math>\underline{P}^{WW}</math></u> | <u><math>\Sigma</math></u> |
|--|--|--|--|----------------------------|
| 11   | 48   | 41                                       | 10                                       | 110                        |

R. I. Brawn

### 4. Brown pericarp and salmon silks with $\underline{P}^{VV}$ .

The gene combinations  $\underline{P}^{VV}$  bp (brown pericarp) and  $\underline{P}^{VV}$  sm (salmon silks) have been synthesized. The first has brown stripes on a clear background as expected. The silks with sm, however, are not pigmented, even when a sizeable area of red pericarp occurs on an ear. This is understandable since the red pigment of the pericarp on newly arisen red spots, and the stripes of medium variegated, do not seem to extend to the silk attachment region.

On the other hand the pericarp phenotype "dark crown", which has thus far defied genetic analysis, might be expected to interact with sm to produce pigmented silks. It is planned accordingly to examine the dark crown situation in the background of sm.

The principle reason for synthesizing these combinations is to study the residue at the P locus after the controlling element Mp has transposed away from the locus. It appears that the self-colored (red) pericarp mutants arising from  $\underline{P}^{VV}$  following transposition of Mp are not all alike in color. In the background of sm and bp it may be possible to make more definitive observations.

R. I. Brawn

MAIZE RESEARCH STATION  
Yousafwala (Montgomery), West Pakistan

Maize is an important summer season crop in West Pakistan where it is grown over an area of over one million acres every year for the production of grain. About as much area is grown for fodder. Maize being a

crop that provides subsistence for both human beings and cattle, considerable stress is being laid on its improvement in recent years. A Research Station equipped with necessary facilities has been started at Yousafwala (Montgomery) with the object to evolve and introduce high yielding maize hybrids suitable for the soil and climatic conditions available in this part of the country. A good collection of elite inbred lines has been collected from United States and elsewhere for direct use in the commercial hybrid seed production after ascertaining suitable cross combinations.

Some of the important problems tackled at this Research Station are briefly outlined below.

#### Evolution of maize hybrids for different cropping patterns.

In countries like Pakistan where agriculture has to face a fast increasing population, more intensive cropping systems have to be adopted. Different types of hybrids are required for introduction to various cropping patterns prevalent in West Pakistan. In submontaneous area districts short-duration hybrids are needed for growing in between two crops of potatoes while hybrids with medium maturity are required for wheat growers who want to take a crop of maize before planting their wheat crop. For sugar cane and tobacco growers maturity is no problem. They want high yielding hybrids that may take up to 120 days to mature.

To provide maize hybrids for different cropping patterns breeding material of different maturity periods is being developed.

A variety obtained from Nouran Valley in the northern areas of Pakistan that comes into flowering 30 days after planting and matures in 58-60 days has been included in the breeding program for evolving early maturing hybrids. It is being crossed to elite inbred lines viz: Pb7, M14, WF9, 38-11, Hy, L317, 52B and 20P2. The resulting material will be divided into different maturity groups and desirable lines drawn for commercial production.

#### Studies on borer resistance in maize.

Corn borer (Chilo-zonellus Swin.) is a serious pest of maize in West Pakistan. It inflicts heavy losses every year to the corn industry in this country. With a view to developing breeding material that can withstand the attack of this devastating pest a few exotic hybrids known to be resistant to European corn borer (Pyrausta nubilalus HBN) were imported through the courtesy of United States Operations Mission in Pakistan. Advanced generations of these hybrids were subjected to the attack of the pest during the spring season. Artificial liberation of larvae was also tried. It is gratifying to note that quite a number of plants in the progeny of each hybrid stood up. These plants were interpollinated and their progeny grown during the regular crop season, i.e., late in summer. Selected plants from this synthetic were again interpollinated and the resulting plants again subjected to the attack of borer in the next spring season.

It has been observed that in every advanced cycle generation the number of plants that withstand the attack of borer is increasing significantly. It is hoped that after a few more cycles of recurrent selection sufficient resistance will be developed in the material to withstand the attack of the pest.

This corn borer is active from March until July, thereby relegating the growing period of maize to the fag end of the season. The limited growing season has forced the farmers to grow short duration varieties with the result that acre yields of maize are very low in this country. Efforts to develop borer resistant maize hybrids will enable the farmers to grow a long duration crop and thereby increase their yield.

#### Evergreen maize hybrids.

The maize crop is raised both for grain and green-fodder in the canal colonies of West Pakistan. The stalks of the crop usually dry up at the time of maturity and as such cannot be utilized for forage purposes. Under the circumstances the necessity for the evolution and introduction of a maize strain that matures its grain while the plants are still green had long been felt. One of the breeding lines at Yousafwala was found to be segregating for the evergreen character. The plants bearing this character remain perfectly green for about one month after the cobs are matured and harvested. Hybrid combinations from this material will provide the farmer at once grain for his family as well as green fodder for his cattle. There is a general shortage of green fodder at the time when the maize crop is harvested, as the summer season fodder crops are over and winter season crops are not yet ready for harvesting.

In view of great economic value of the evergreen character for the farmers in West Pakistan, a regular breeding program has been undertaken to transfer this habit into important inbred lines viz: Pb7, M14, WF9, L318, 38-11, WM13R, 54AP1 and 20P2 to incorporate it in the commercial hybrids.

A. Ghafoor Bhatti

MARQUETTE UNIVERSITY  
Milwaukee, Wisconsin

#### 1. Chromosome numbers in maize root tissue culture.

During the past year and a half we have maintained continuous cultures of corn root callus on a modified basic White's media containing 2-4D. Before attempting to utilize such a tissue culture technology in genetic studies it was important to first determine the stability of the chromosome complement. Toward this end, and after nine months of continuous culturing, chromosome counts were made on nine cultures derived from seven independently initiated ones representing marked genetic stocks in two inbred backgrounds.