

(Foundation stock of inbred WF9-21MS and background information were kindly supplied by Dr. W. J. Mumm, Crow Hybrid Corn Co., Milford, Illinois, U.S.A.)

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1. Inheritance of blotched leaf.

Blotched leaf (bl) was first reported by R. A. Emerson (Cornell University Agr. Exp. Sta. Memoir 70:1-16, 1923). N. W. Simmonds presented data (MNL 24:26-27, 1950) showing linkage of a similar character, which he called blotched-3 (bl₃), with some undetermined "anthocyanin locus" he thought likely to be the R factor.

A blotched leaf character was observed in some breeding material at this station. In linkage tests with a series of translocations obtained from Dr. C. R. Burnham, a linkage of $21.3 \pm 2.64\%$ recombination was obtained between the character and T2-9c (2S.49 and 9S.33). Unfortunately the cross with the other interchange marking the short arm of chromosome 2 failed. However, two other interchanges involving the short arm of chromosome 9, T6-9 and T9-10b, showed no linkage with blotched leaf. The T1-8a culture was segregating for the B factor and this factor gave a recombination value of $22.97 \pm 4.89\%$ with blotched leaf.

There was considerable variation in expression of the blotched leaf character. It seems likely that Emerson's blotched leaf and Simmond's blotched leaf-3 were the same and that Simmond's "anthocyanin locus" was "B" and not "R". These data would locate "blotched leaf" on the short arm of chromosome 2.

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1. Amylose breeding progress.

In our 1952 MNL report (Newsletter 26, page 5) the ae gene was reported and its influence on increasing amylose at the expense of amylopectin was noted.

Progress of the hybrid development program and studies of the ae influence in various endosperm combinations were reported in the Agronomy Journal, 50:595-609, 1958.

Currently, amylo maize hybrids, with amylose content between 50-70%, are being grown under the Bear brand name, Amicorn. Hybrids containing 70-80% amylose have been developed and will be available for general production by 1967.

Source stocks containing up to 85% amylose have been developed by the use of recurrent and reciprocal recurrent selection. These sources are currently being used to develop hybrids with above 80% amylose. The amylose increase in sources has averaged about 2% per year by growing multiple generations.

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1. Further studies on the characteristics of teosinte chromosomes.

a. Florida teosinte: Microsporocytes of 16 additional F₁ hybrid plants of maize-Florida teosinte were examined. One-fourth of these plants had well-spreading pachytene chromosomes. Therefore a clear observation of the characteristics of Florida teosinte chromosomes could be made. Chromosomes 1, 2 and 3 were knobless. There were three knobs on chromosome 4; in addition to two terminal knobs there was an internal knob on the short arm. The two arms of chromosome 5 were terminated by knobs. An internal knob was present on the first knob position of the long arm of chromosome 6 and a small terminal knob on the short arm of the same. There was a large internal knob on the long arm of chromosome 7. The long arm of chromosome 9 had a large terminal knob. Chromosomes 8 and 10 had no knobs.

As previously reported, In9 in the short arm of chromosome 9 was observed in all of the F₁ plants having well-spreading pachytene chromosomes. However, the paracentric inversion in probably the long arm of chromosome 3 was found only in certain plants, indicating that this inversion existed as a heterozygote in the teosinte parent. Anaphasic evidence showed that this In3 had increased the frequency of crossovers within the inverted segment of In9.

The previous study of Longley (1937) reported that Florida teosinte like other teosinte varieties from southern Guatemala, had only terminal chromosome knobs. It has now been found in the present study that there were three conspicuous internal knobs. Possibly the teosinte employed in this study came from a different population from that of Longley's. It might also be possible that the knob substance in teosinte and its relatives represents an unstable heterochromatin. This heterochromatin may transpose from one position to the other, or from one chromosome to the other, by an unknown mechanism.