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1. Studies in the development of "Notched leaf of corn".

In the 1969 volume of the Maize Genetics Cooperation News Letter, Bhat and Pande reported the occurrence of a new leaf character in Caribbean Flint Composite Corn. The new character has subsequently been assigned the name "Notched leaf of corn" and symbolized with Nt. Reported observations, then, were confined to the positioning of Nt and its external morphological details. During the summer growing seasons of 1969 and 1970, Nt was studied at great length for its development. This communication is based on those studies.

In the 1970 population of 7600 plants, in different self or hybrid generations, the first Nt appeared in a self family on the forty-fifth day from sowing. In a homozygous population, Nt appeared on different plants at varying time intervals but all within ten days. In an individual plant bearing Nt on more than one leaf, the character appeared more or less simultaneously on all the leaves, but exceptions have frequently been recorded where Nt appeared on lower leaves seven days prior to upper leaves.

In initial stages of development Nt appears as a single or a series of parallel or in many cases coalescing whitish streaks or bands. These bands differ considerably in their longitudinal spread. From less than one centimeter in some cases, it may extend through the entire length of the leaf. In later cases fully developed Nt appears to have either a solitary comet like "tail" or a number of diverging "tails". Against light, streaks and bands look very bright white against a green leafy background.

The second step in the development of Nt consists of the centrally oriented fusion of streaks and the appearance of a groove at the broad point in the band. Within forty-eight hours, one or more deep indentations (= Notch) appear on the leaf. A notch usually bears one or two deep indents but as many as five in a series have also been noticed. In forty percent of the cases, bands or streaks develop only imperceptible

grooves or none at all. In later types Nt is represented by faint or sharply defined streaks or bands. In many leaves, thus, well defined Nt can be seen side by side with a Nt recognizable only when the leaf is viewed against light.

Towards maturity soft, silky bristles develop on both dorsal and ventral surfaces of Nt. These bristles are thicker, longer and denser than those normally found on the leaf surface. Before drying of the plant blotches of pink colour appear on the Nt. These blotches turn brownish with drying.

Though the spatial position of a Nt on the leaf, from its inception to maturity, is stationary, in scattered cases Nt seems to "shift" upward towards the apex. It appears that Nt is carried upward with developing tissue. In a closely observed case a break in the band occurred at the point of initiation and Nt appeared well above toward the apex. A connection between the two was maintained by a thread-thin streak. It, therefore, is cogent to conclude that only a specified tissue zone is transformed to Nt and that the process of development is pre-defined.

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## 2. Character association of "Notched leaf of corn".

While investigating large populations for Nt, the frequency of some other plant characters in modified expressive forms was found to be significantly high. These characters, however, do not show a close linking with "visible" Nt. Four characters studied in detail are discussed below.

(A) Pollen production and sterility: Very poor pollen production in Nt populations was noted in the summer of 1968. Partial sterility of the pollen has also been noticed. Anthers, though well developed, fail to dehisce. Pollination with crushed anthers produced very few or no grains. In continuous self progenies the loss in pollen production has increased significantly. A tendency of "more notching - less pollen" is discernible in these families. A very poor seed set is obtained in hybridisation attempts. In hybrids involving Nt as a parent, the pollen production is normal.