

in crosses and still maintaining their identities even when their flowering periods overlap.

Mario Castro Gil

4. Some reasons for depressed yield in dwarf corns.

Productivity in corn has frequently been reduced when dwarfing genes have been introduced into varieties or hybrids.

Leaves of brachytic-2 corn plants and other dwarf types emerge from the nodes in a single vertical plane, internodes are really short, leaf width is frequently increased and as a result the tassel is proportionately very big. It appeared to us that one of the main reasons for depressed yield in most dwarf corn types could be increased intra-plant competition for light. Since dwarfing genes could be of extreme importance in corn breeding programs, a study was set up to determine the effect on yield of varying light penetration by changing the canopy arrangement. A homozygous brachytic-2 open pollinated variety (having 75% of Puebla Group 1, 12.5% of Tuxpeño and 12.5% of Cónico Norteño) was grown in Roque, Guanajuato, Mexico in 1969 and subjected to 4 treatments:

- a) Normal planting (control).
- b) Leaves above ear positioned upright from flowering time on (UL).\*
- c) Midribs of leaves oriented East to West (EW).\*\*
- d) Midribs of leaves oriented East to West and leaves above ear positioned upright from flowering time on (UL + EW).

The plant density was 60,000 plants/ha. A two replicate randomized complete block design was used. The plot size was 6 rows 6 m long.

Grain yields are presented in Table 1 for the 4 treatments.

---

\*Leaves were positioned upright with transparent plastic bands holding them from the stalk.

\*\*Seedlings were oriented East to West 10 days after emergence in very wet soil.

Table 1

Yields of brachytic Puebla Group 1 variety under four arrangements of the canopy.

Arrangements of the canopy	Grain yield (Ton/ha.)
Control or normal planting	9.93
UL	10.71
EW	11.10
UL + EW	12.15

5% LSD = 1.28

Our results clearly show that the productivity of Puebla Group 1 brachytic could be raised substantially by selecting genotypes that permit a better penetration of the light into the canopy. It may well be that reduced light penetration is responsible for low yields in other dwarfs. The information presented here is intended to help breeders to understand better the characteristics they should be looking for while selecting in dwarf types. As far as we know the plant characteristics that may help to improve light penetration are: erect narrow leaves, reduced tassel size, and unbranched and also longer internodes. Unless practical and economic systems are developed to orient plants in the field, genotypes with leaves emerging from the nodes in different directions should be preferred because intraplant competition for light would not be as intense as it is in plants with all leaves emerging in the same direction.

Youssef Sulli Katta  
Mario Castro Gil