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Comparison of Stay Green and non Stay Green Maize Hybrids for Forage Use

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INTRODUCTION

It is often assumed that genotypes remaining green through the final phase of the maduration of the grain (stay green) can increase stover yield. This is desireable in forage maize. By retarding the drying of the plant (Gentinetta et al., 1986), the stay green trait also allows for flexibility in the silage period. In order to clarify these aspects, stay green (SG) hybrids were compared with non stay green (NSG) hybrids with respect to characters relevant to forage during the optimum silage period.

MATERIAL AND METHODS

Three hybrids considered to be SG: P-3186(1), Furia(2) and Adour-650(3), were studied along with another 3 hybrids considered to be NSG: PR-3374(4), AE-703(5) and PS-734(6). All are commercial hybrids with similar development, a late cycle and high grain production. Four harvests were made with 3 days between successive harvests. The dry matter of the whole plant ranged between 31 and 34% (which is considered to be within the optimal range for silage). The experimental layout was a triple factorial design (hybrid, harvest, and block) with 3 blocks and 16 plants per plot. The following traits were considered: number of dry leaves, % dry matter of the stover (%sDM), ear dry weight and stover dry weight.

RESULTS AND DISCUSSION

Significant differences were obtained for the effects of hybrid, harvest and hybrid x harvest for all controlled traits.

While the presumedly SG hybrids confirmed this trait, the hybrid 4 proved to be closer to the SG than the NSG hybrids (Fig. 1a). The three indices proposed for the quantification of the SG trait (Fig. 1) provide coherent results and could therefore be used to describe other materials.

The evolution of stover yield for each harvest can be described as decreasing, this effect being more pronounced in the NSG hybrids (Fig. 2a). Therefore, given equal production, it would be recommendable to choose SG hybrids, as the slower degradation of the stover in plants with this trait allows a greater margin of time for silage.

Fig. 1: Evolution with respect to harvest of the following traits (----- NSG):
1a. Number of dry leaves.
1b. Proportion of % sDM with respect to the mean of the corresponding harvest.
1c. Proportion of moisture content with respect to that of the 1st harvest in equal amounts of dry matter $[(100-x_1)/(100-x)](x/x_1)$ being x=% sDM, and x_1= % sDM in the 1st harvest.

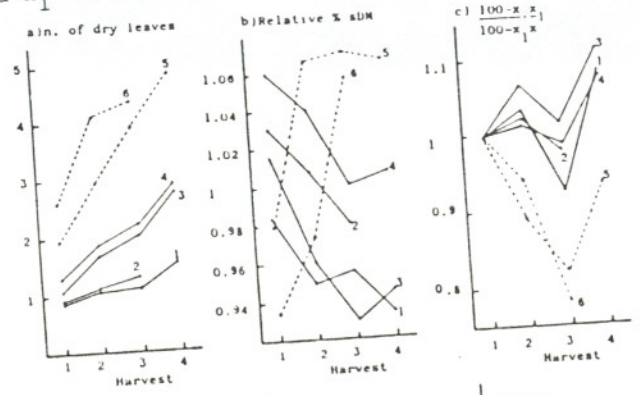
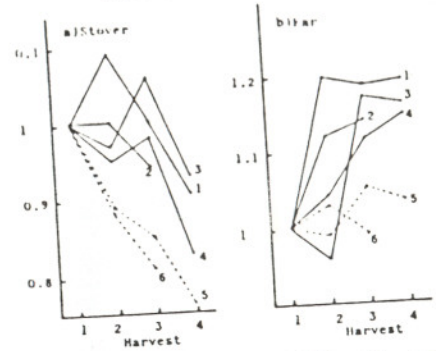


Fig. 2: Evolution of the yield expressed with respect to the 1st harvest (----- NSG).



The content of dry matter in the ear was stabilized earlier in the NSG hybrids than in the SG hybrids (Fig. 2b). This signifies that the SG trait also increases the period of dry matter accumulation in the ear.

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