

## COMBINING ABILITY ANALYSIS OF TOTAL SUGARS AND STARCH CONTENTS IN KERNELS OF SWEET CORN (*Zea mays* L.)

Ahmed R.A. Aggour, Lotfy A.A. Badr, Fathy A. Abou Sedera and  
Mamdouh S.A. Shaban

Department of Horticulture, Faculty of Agriculture, Moshtohor, Zagazig University, Benha Branch

### ABSTRACT

Eight inbred lines of sweet corn were crossed to produce a non-reciprocal diallel set of crosses, i.e. 28 single crosses. The additive type of gene action was more important than the non-additive type in the inheritance of total sugars and starch contents in kernels at harvesting time and percentage of total sugars decrease and starch increase in kernels of green ears stored at room temperature ( $30\pm3^{\circ}\text{C}$ ) for 4 days. The narrow sense heritability estimates were 34.9% and 9.5% for total sugars content in kernels at harvesting and percentage of total sugars decrease after storage at room temperature, respectively. In addition, the narrow sense heritability estimates for starch content in kernels at harvesting time and percentage of starch increase in kernels of fresh ears stored at room temperature were 36.2% and 56.8%, respectively. Selection for the improvement of the above mentioned characters in the segregating generation should be performed according to family mean basis in replicated experiments, except in case of the percentage of starch increase in kernels of fresh ears stored at room temperature, whereas, single plant selection will be effective. Positive correlation coefficients were detected between percentage of total sugars in fresh kernels and each of ear position ( $r = 0.63$ ) and ear length ( $r = 0.50$ ), while the correlation was negative with each of number of days to tasseling ( $r = -0.48$ ) and number of days to silking ( $r = -0.42$ ). Furthermore, simple negative correlation ( $r = 0.69$ ) was observed between percentage of starch content of kernels at harvest and percentage of starch increase in kernels of fresh ears stored at room temperature ( $30\pm3^{\circ}\text{C}$ ) for 4 days.

Key words: Sweet corn, Combining ability, Correlation, Heterosis, Heritability, Sugars, Starch

### INTRODUCTION

Sweet corn (*Zea mays* L.) is considered one of the ten most important vegetable crops (Kaukis and Davis 1986). It resulted from a mutation in chromosome 4 at the Su 1 locus of the cultivated corn, *Zea mays*