RECURRENCE OF MULTIPLE MEIOTIC ABNORMALITIES IN MAIZE GENOTYPES FROM THE SAME ORIGIN AND THEIR INFLUENCE ON PRODUCTIVITY. Pagliarini MS, Defani MA², Meirelles WF, Pereira JE⁴. Department of Cell Biology and Genetics, State University of Maringá, 87020-900 Maringá PR Brazil. Department of Biology, State University of Maringá, 87020-900 Maringá PR Brazil. National Center of Research on Maize and Sorghum/Embrapa, Sete Lagoas MG Brazil. National Center of Research on Soybean/Embrapa, Londrina PR Brazil. <u>mspagliarini@uem.br</u>

Meiosis is an event of high evolutionary stability that culminates in the reduction of the chromosome number. The cytological events of microsporogenesis and gametogenesis are controlled by a large number of genes ranging from the pre-meiotic to the postmeiotic mitoses. When an allogamous plant is submitted to self-fertilization, many genes affecting all plant characteristics, including those involved in the control of the meiotic process, enter homozygosis causing inbreeding depression. The CNPMS is a governmental breeding enterprise that provides the basic genetic material for the Brazilian maize breeding programs developed in different regions of the country. Previous analyses of homozygous and heterozygous maize genotypes originated from CNPMS populations demonstrated high meiotic instability. The frequency of meiotic abnormalities among single-, double- and triple-cross experimental hybrids and their parental inbred lines is studied 30 genotypes of the Cooperativa Agricola de Cotia, including homozygous and heterozygous genotypes originated from some CNPMS populations and from one population of distinct origin. Our aim was to verify whether they present the same meiotic abnormalities found previously in those materials of the same origin and the influence of these abnormalities on productivity. Male inflorescences were fixed in 3:1 alcohol/acetic acid solution, transferred to 70% alcohol and stored under refrigeration. Slides were prepared by squash technique, followed by staining with 1% propionic carmine. All the meiotic phases in 300 cells per plant and in seven plants per genotype were analyzed. A comparative study of productivity among genotypes was performed taking into account the grain weight (gr.) of five years. Analyses showed the presence of the same abnormalities described in inbred lines and hybrids of two other distinct breeding enterprises, albeit at a lower frequency. The most common abnormalities in homozygous and heterozygous genotypes from CNPMS populations were related to irregular chromosome segregation and to chromosome stickiness. An inbred line from a distinct population only had abnormalities related to irregular chromosome segregation caused by the presence of univalent chromosomes. This kind of abnormality is caused, in general, by homozygosis in the polygenic system that controls chiasma frequency. It is frequently found in inbred lines and does not represent a type of meiotic instability. This line was unique among the sixteen analyzed that did not present the abnormalities commonly found among those originated from CNPMS populations. The Pearson correlation procedure showed high negative correlation between meiotic abnormalities and productivity. Taking into account that spontaneous meiotic mutations are rare in nature, the causes of high frequency of meiotic abnormalities found in genotypes from CNPMS populations are being speculated on the basis of transposons activation. Órgão Financiador : CNPq