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Poster Abstract – A.12

SEED CALORIFIC VALUE IN DIFFERENT MAIZE GENOTYPES AND CORRELATION ANALYSIS WITH SOME SEED CHARACTERISTICS

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maize seed, calorific value, oil content, percent embryo, seed weight

The extensive use of fossil fuels implies a number of problems worldwide. On the environmental side, CO_2 emissions from fossil fuels are believed to contribute to global climate change. In this context, most countries have issued energy and environmental policies that stresses the use of biomasses. In fact, biomasses represent an important source of renewable energy with the potential to diminish both dependence on fossil fuels and CO_2 emissions. Useful biomasses are animal waste, urban solid waste, but principally vegetal biomasses, including whole plants, plant products, plant residues and wastes. Energy from biomasses can be exploited in several ways: direct burning to produce heat or electrical energy (e.g. dry biomasses: wood chips, pellets, etc.), as transport fuel (e.g. biodiesel, etc.), or as chemical feedstock for fermentation (e.g. bioethanol, biogas, etc.).

The exploitation of biomass for energy arises problems when its production comes in competition with that of food crops. However, a moderate use of a food crop, such as maize, for energy production can still be beneficial in some circumstances. Direct burning of mycotoxins contaminated maize grain for house heating or for harvested grain drying may represent an interesting and economically proficient way to salvage otherwise unusable production.

The aim of this work is to find those seed parameters correlated with the heat content, which can be helpful to assess the suitability for direct burning of existing maize genotypes. Such parameters could also be useful in breeding programs aimed at seed calorific value. The genotypes included in this study are: four commercial hybrids (PR 33A46, DK 6530, NK HELEN, DK 440), the B73xMo17 hybrid, the Scagliolo population, two inbred lines (B73 and Mo17), a pop corn variety, a high oil genotype and a sugary mutant.

Since the heat obtained by direct burning of biomass depends mostly on its gross calorific value and moisture content, in this communication we present the gross calorific value of the genotypes analyzed. In addition, our results indicates that seed weight and oil content show a significant correlation with calorific value. In particular, we concluded that seed weight seems a good parameter to asses suitability for direct burning of seeds of most maize genotypes.