Study Crop Water Productivity in Vulnerable Production Systems in Central Mozambique through Conservation Agriculture

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In order to monitor and evaluate water balance partitioning and soil fertility over time of Conservation Agriculture (CA) a long-term trial, in Sussundenga agrarian station, central Mozambique, is jointly being conducted by CIMMYT, TSBF-CIAT and BOKU University. The trial was established in the year 2006 under the principle that CA is the agriculture production system based on no-tillage and the maintenance of a cover on the soil surface. The local climate in Sussundenga is wet semi-arid, average annual rainfall 1155 mm and potential evapotranspiration 1386 mm. The dominant soil type in the trial plots is haplic lixisol and soil texture is loam. The trial is a randomised blocks design with four replications, one conventional treatment with sole maize, using the mouldboard plough, and nine CA treatments utilizing different seeding technologies and crop rotation of sunflower, beans and maize. The set of data being collected include meteorological data, soil characteristics of layers 0-10, 10-20, 20-30, 30-60, 60-90 cm depth and crop management.

Preliminary apparent observations indicated higher infiltration rates in CA plots compared to the conventional treatment, in rain events water ponding was observed in the later; gully erosion was registered in conventional plots resulted from a furrow left in the middle of each plot after tillage, this was as well observed in farmer's fields in the surrounding area. Erosion will definitely have medium and long-term impacts on crop production and soil and soil nutrients loss. An unexpected observation was the termite activity in the trial plots. Therefore, other study was initiated to assess the extent and trend of termite activity in relation to CA in the trial. Further detailed investigation will be performed in the next growing seasons to assess the impacts and the benefits of CA on crop water productivity in central Mozambique.

Keywords: Conservation agriculture, gully erosion, infiltration rate, termite activity.