

10th International Conference on

AGRICULTURE & HORTICULTURE

October 02-04, 2017 London, UK

Optimizing water and nitrogen use efficiency of maize in conservation farming systems

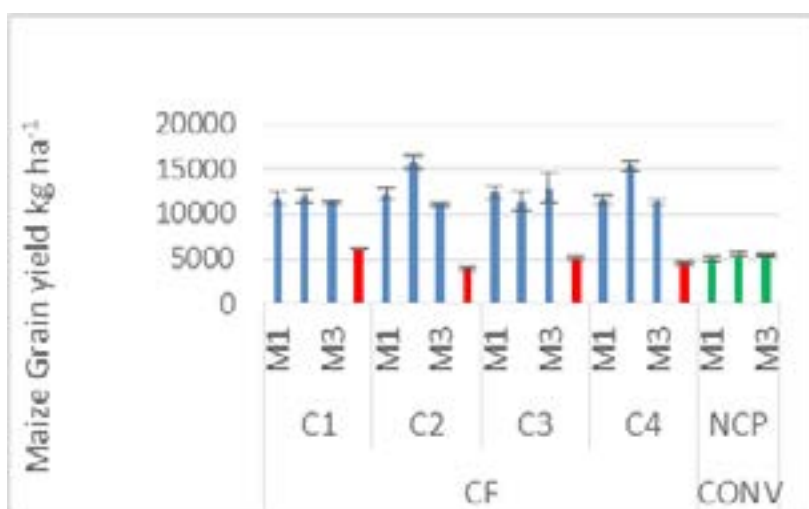
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Statement of the Problem: About 80% of the one million five hundred smallholder farmers in Zambia depend on producing maize (*Zea mays*) which is a major staple food for over 90% of the Zambians. Productivity of the maize crop among the smallholder farmers is quite low giving a national average yield of 2.3 tons per hectare. The major causes of low yields countrywide are attributed to prolonged droughts, low soil fertility, insufficient plant nutrients and poor farming practices. The purpose of this study is to evaluate performance of drought and Low N tolerant maize genotypes in the conservation farming system and identifying maize – cowpea combinations for high maize productivity in the CF system.

Methodology & Theoretical Orientation: The trials were established at two sites of different soil types. Three maize varieties ZMS 606, GV 640 and GV 635 were evaluated for water and nitrogen use efficiency under conservation and conventional farming systems. The experimental design used was split plot in a Randomized Complete Block Design (RCBD).

Findings: Between the two sites, Chisamba produced higher maize grain yield (7960kg ha⁻¹) than Batoka (4453kg ha⁻¹). Maize grain yield in conservation farming system was significantly higher at P<0.05 by 30% than in conventional farming system. ZMS 606 and GV 640 were superior over GV 635 during 2015/2016 and 2016/17 growing seasons respectively. Cowpea genotype BB 14-16-2-2 significantly contributed to high yields of maize.

Conclusion & Significance: Conservation farming performed better than conventional farming system on improved maize varieties. Smallholder farmers in Zambia can increase maize productivity through use of conservation farming system and improved maize varieties due high water and nitrogen use efficiency. Recommendations are made for farmers to select improved high water and nitrogen efficient maize varieties to optimize productivity of maize in conservation farming.



Biography

Simunji Simunji is a PhD student at University of Zambia and he is working for Golden Valley Agricultural Research Trust (GART). He has experience in applied research mainly in conservation farming as an Agronomist since 2004. The study was conducted to determine improved methods of optimizing water and nitrogen use efficiency in conservation farming systems to increase yields of maize.

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