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PRODUCTIVITY AND EFFICIENCY ANALYSIS OF MAIZE UNDER CONSERVATION AGRICULTURE IN ZIMBABWE

ABSTRACT

This study assesses the productivity and efficiency of maize production under conservation agriculture (CA). The analysis is based on a three year (2008-2010) panel sample of small holder farming households across 15 rural districts in Zimbabwe. We make a comparison of CA with alternative conventional farming methods. Our empirical strategy consists of two methods. First, using a fixed effects model, we estimate maize production functions and derive technical change estimates under CA and conventional farming. Second, we estimate a joint stochastic production frontier to compare productivity and technical efficiency between CA and conventional farming. Under CA, technical progress has been land-saving but seed and fertilizer-using, while it has been land-using but seed-saving in conventional farming. Lastly, the results of the efficiency analysis show that that farmers produce 39% more in CA compared with conventional farming, but technical efficiency levels are essentially equal in both technologies. Overall, the results show significant yield gains in CA practices and significant contributions to food production. CA is land-saving, and this is an important issue for land constrained farmers because they can still have viable food production on smaller area. However, high labor and fertilizer demands in CA present some problems in adoption amongst resource-constrained farmers. (C) 2013 Elsevier Ltd. All rights reserved.

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