



Conservation Agriculture Based Annual Intercropping System for Sustainable Crop Production: A review

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Abstract: The objective of this paper was to provide an inclusive view and evaluation of conservation tillage based annual intercropping, summarizing their main advantages and challenges to use as compared to conventional crop production system. Conservation tillage based intercropping (CTBI) controls soil erosion caused by conventional tillage based sole/mono-cropping as compared to conventional crop production system. Its long term effect gives higher percentage of organic matter and organic carbon as compared to conventional tillage based mono-cropping due addition of carbon input from the intercropped legumes and residues from conservation tillage. CTBI system in the long term significantly lowers the bulk density in the top layer and in turn improves the soil pore size distribution. Similarly, it resulted in higher total N, available K and Mg content than conventional crop production system. CTBI had significantly higher infiltration characteristics, soil water content, water use efficiency than continuous sole cropping and conventional tillage based intercropping. And also establishes more biodiversity into agroecosystems and reduces the addition of chemicals and gases that triggers greenhouse gas accumulation in the atmosphere. The CTBI is used as the primary means of sustainable crop production system by improving soil health, promoting diversity of diet, stability of production, reduced pests, efficient use of labor, intensification of production with limited resources, maximization of returns under low levels of technology and used as insurance against crop failure. However, in Ethiopia conservation tillage based annual intercropping system becomes effective if and only if inclusive research and extension service and appropriate land use policy over it should be implemented.

Keywords: Conservation tillage, Annual Intercropping, Soil fertility, Crop production
