



Tropentag, September 16-18, 2015, Berlin, Germany

“Management of land use systems for enhanced food security:
conflicts, controversies and resolutions”

Evaluation of Tillage Reduction for Potato Production in Slope Areas of Los Andes Mountains in Colombia

FERNANDO LOZANO OSORNO, BERNARDO CASTILLO H.

National University of Colombia, Agricultural Engineering, Colombia

Abstract

In Colombia, the potato is grown in mountain areas above 2800 m asl. In general, tillage and subsequent agricultural practices lead to a soil degradation by erosion, compaction of deep soil layers and loss of productive capacity. In addition, the mechanisation and inputs costs are high. In order to find a more conservationist alternative, a research in a potato growing area of the municipality of Fúquene - Cundinamarca at an altitude of 2930 m asl, was conducted. Three production systems: Conventional, minimum, and zero tillage; were contrasted. In all treatments as green manures, crop rotation, and plant cover, Caldas Oats (*Avena sativa* L.) and Turnip (*Raphanus sativus* L.) were implemented. During 8 months counted from the planting of the green manure to just before depositing the second rotation of green manure, the performance of physic and hydraulic soil properties, namely infiltration, bulk density, moisture content and cone index, as well as the change of the chemical analysis of soil were evaluated. The yield of the potato crop was also measured.

Caldas oats had a production of 4506 kg DM ha⁻¹ despite having a lower seeding density than turnip. Green manure did not change soil pH; the greatest contributions of organic matter were obtained with the reduced tillage. Because of the destruction of the topsoil, the basic infiltration suffered a high reduction in the conventional tillage. The best performance of infiltration was found with zero tillage. Due to the vegetal cover during the development of the crop, the moisture content was higher in zero and minimum tillage. In the lower soil layers, the effect of machinery, promoted an increase in bulk density and cone index in the conventional tillage.

The results showed that the best treatment was the minimum tillage with turnip as green cover because it produced 16.250 kg potatoes ha⁻¹.

Keywords: Conservation tillage, green covers, potato