Tropentag, September 18-21, 2016, Vienna, Austria

"Solidarity in a competing world — fair use of resources"

Maize Relay with Legume without Residue Burning Impact on Soil Erosion and N Loss in Northern Thailand

Adirek Punyalue[1], Jedsada Jongjaidee[1], Sansanee Jamjod[2], Benjavan Rerkasem[2]

[1] *Highland Research and Development Institute (Public Organisation), Dept. of Research, Thailand*
[2] *Chiang Mai University, Thailand, Agriculture, Thailand*

Abstract

Maize production in Thailand has expanded into the highlands, with land preparation by slash and burning residues from the maize crop. This has many detrimental effects on soil erosion and soil fertility, leading to reduction in maize yield and farmers' income, as well as adding to the haze problem in the lowlands. This study evaluated runoff, soil erosion, nutrient loss and maize yield on maize relay cropping with legumes without residue burning. The experiment was conducted in the rainy season of 2014 and 2015 in a highland field with 40 % slope at Santisuk district, Nan province in northern Thailand. There were 3 treatments consisting of the common farmer's practice of maize with residue burning, maize without residue burning and maize + lablab bean without residue burning, the measurement of runoff soil and N loss was based on three replicate 40 m^2 plots. Growing maize without residue burning reduced runoff, soil and N losses when compared with residue burning. Relaying legume into the maize crop further reduced runoff and soil loss. By the second year there was a small effect of not burning residues on maize yield, and significantly larger effect of adding a legume. Maize + lablab without burning yielded 22 % more maize grain than farmer's practice of residue burning, as well as an additional 0.77 t ha^{-1} of the lablab grain. Growing maize without residue burning land preparation practice and relay with a legume is promising as a method to reduce soil erosion and nutrients loss, increasing grain yields and farmers income, and lessening the impact on the haze problem. Further studies should explore more legumes for relaying and participatory research to determine the feasibility of how this practice may be adapted to management by highland farmers.

Keywords: Maize, N loss, runoff, soil erosion

Contact Address: Adirek Punyalue, Highland Research and Development Institute (Public Organisation), Dept. of Research, Chiang mai, Thailand, e-mail: adirek_p311@hotmail.com