



TẠP CHÍ KHOA HỌC KỸ THUẬT
CHĂN NUÔI



Journal of Animal Husbandry Sciences and Technics (JAHST)

Năm thứ 27

ISSN 1859 - 476X



KHOA HỌC - CÔNG NGHỆ

Special issue APE2019: ANIMAL PRODUCTION AND ENVIRONMENT

HỘI CHĂN NUÔI VIỆT NAM
ANIMAL HUSBANDRY ASSOCIATION OF VIETNAM (AHAV)

No. 249

September
2019

IMPROVEMENT OF MAIZE STOVER NUTRITION AS RUMINANT FEED WITH MANURE PLUS AND INORGANIC FERTILIZER

Dwi Retno Lukiwati^{1*}

Submitted Jul 17, 2019 - Accepted Aug 19, 2019

ABSTRACT

Zea mays in Indonesia is used by farmer under crop-livestock integrated farming system (CLIFS). Integrated farming system hold special position as in this system nothing is wasted, the by-product of one system becomes the input for other. Crop yield for food and crop residues (stover and cornhusk) can be used for livestock feed, while farmyard manure as organic fertilizer can enhance agriculture productivity by intensifying nutrients that improve soil fertility, reducing the use of chemical fertilizers. The quality of farmyard manure could be enhanced by adding organic phosphorus (P-guano, P-phosphate rock) and organic nitrogen (N-legume) at initial phase of decomposition process, that was called as manure plus. Manure plus being locally available is cheaper sources of nutrient availability, and could be an alternative organic fertilizer to replace TSP and urea and reduce cost of crops production as well. Application of manure plus to improve maize stover and cornhusk nutrition as ruminant feed have been done since 2013 until 2018 in Central Java Indonesia will be presented in this paper.

Keywords: Maize, manure, nitrogen, phosphorus, nutrient.

1. INTRODUCTION

Zea mays is one of the key food crops in the world, serving as a staple food and main economic contributor for the people of the Asian continent. Sweet corn (*Zea mays* var. *saccharata*) is a type of speciality corn used as fresh or canned vegetable. It has sugar content greater than 25% during the milking stage (Singh and Reddy, 2011) with milky and sweet grain (Silva *et al.*, 2007). Another variety of maize is sticky maize or waxy corn (*Zea mays ceratina* L.). It is a variety of maize with high amylopectin content 90% (Ramansyah *et al.*, 2013). Sweet corn and sticky maize are utilized as raw materials for various uses also with a majority for food, while corn stover and cornhusk are used for ruminants feed in the tropics. Sweet corn and sticky maize are used by farmers under crop-livestock system (CLS) in Indonesia. The characteristic of CLS is crop yield for food and stover for ruminant feed, being the manure used as organic fertilizer which important to maintain the fertility of cultivated soils. The sweet corn can be harvested in 70-75 days after planting, while sticky maize

in 75-80 days after planting. Both the cornhusk and stover of sweet corn and sticky maize have moisture content between 70-80% (Silva *et al.*, 2007; Lukiwati *et al.*, 2019).

Most of the soil in Indonesia that cultivated for crops production is deficient in P and N. An insufficiency of P and N in the medium from which the crops its mineral nutrition results in retarded growth and reduced development. Phosphorus and nitrogen deficiency can be corrected by applying P and N fertilizer to the soil at or before sowing (Lukiwati, 2007; Abdullah, 2009). Superphosphate (SP) and urea fertilizer is used to improve soil fertility in Indonesia. Superphosphate-36 contains 36% P_2O_5 , with the P in a water-soluble form. However, the high cost of SP is now focusing attention on rock phosphate (RP) or guano fertilizer. Finely ground RP is an apatite mineral not readily soluble in water, and when added to acid soils, the solubilization of RP is increased. The availability of organic P is enhanced under acidic conditions in the soil.

Reactive RP when directly applied at initial rates of between 80-360kg P_2O_5 /ha, not only increased yields of corn, but resulted in similar yields compared to SP (Nassir, 2001). Rock phosphate and SP fertilizers increased maize grain yield, and dry matter (DM) yield of maize

¹University of Diponegoro Semarang, Central Java, Indonesia
*Corresponding author: Dr. Dwi Retno Lukiwati, Faculty of Animal and Agricultural Sciences, University of Diponegoro Semarang, Central Java, Indonesia. Phone: +62248156660889; E-mail: drlukiwati_07@yahoo.com