Productivity of *Brachiaria humidicola* as Results of Different Nutrient Source Application

L. Abdullah, D. Puspitasari, and P.D.M.H. Karti
Forage Crop Science and Pasture Management Division, Department of Nutrition and Feed Technology,
Faculty of Animal Science, Bogor Agricultural University
email: labdull@hotmail.com

ABSTRACT

In many tropical pastures invasive weed like *Chromolaena odorata* becomes a serious species with no redeeming feature and causes poor and low calving rates of local cattle. Utilization of *C. odorata* biomass as organic nutrient source may be an alternative management to eliminate the distribution of the weed and improve pasture productivity. A field study in mini pastures was conducted to recognize annual forage production (AFP), carrying capacity, N and P Uptake, and protein production of *Brachiaria humidicola* (signal grass) grown on soil amended with *C. odorata* biomass and feces as organic nutrient source. Block Randomized Design consisting of: no treatment (blank control = P0); 7.2 kg plot^{-1} of *C. odorata* (PC); 21 kg plot^{-1} of manure (PF); combination of *C. odorata* (3.6 kg plot^{-1}) and manure (10,5 kg plot^{-1}) (PCF) and inorganic fertilizer (573.3 g urea plot^{-1} and 217 g super phosphate plot^{-1} (positive control=PA), with 4 replications. Carrying capacity was calculated according to simulation of accumulate grass production throughout the year. Dried herbage was use to determine forage production, N and P uptake. Protein production was calculated from N concentration multiplied by 6.25. The results showed that PC improved ($p<0.01$) AFP about 225% and 110% as compared to P0 and PF, respectively. PC and PF are able to substitute inorganic fertilizer about 60% and 50%, respectively in resulting similar AFP as compared with those of PA. PC and both PF and PCF increased ($p<0.05$) carrying capacity of the pasture up to 1.7 and 1.3 Animal Unit, respectively as compared with P0. PC, PF and PCF produced higher protein production ($p<0.05$) than P0, and substituted to inorganic fertilizer by 46%, 40% and 49%, respectively.

Key words: Brachiaria humidicola, Chromolaena odorata, manure

INTRODUCTION

High intensity of pasture use due to intensive animal rearing for replacement stock leads to soil and nutrient degradation. In many pasture area in Indonesia, most of degraded pasturelands are invaded by invasive weed species like *Chromolaena odorata*. It is a perennial species and has other name *Eupatorium odoratum* L., *E. Conyzoides* Vahl and *Osmia odorata* (L.) Schultz-Bip (Hanum and Maesen, 1997). In Indonesia it is known with name Kirinyu or Babanjaran (Tjitrosoedirdjo *et al*., 2002 and Sipayung *et al*., 2002). *Chromolaena* grows very aggressive and has ability to intensive sprouting that can change of botanical composition, reduce of pasture quality and cause toxic to animals. Our previous study records that reduction of pasture area due to *Chromolaena* invasion ranged 8-15% a year depending on grazing intensity. It becomes a serious species with no redeeming feature and causes poor and low calving rates of local cattle.

To maintan pastureland and eradicate *Chromolaena,* an alternative management has been studied in this experiment to utilize its biomass as mulch material, rather than eradicating with chemical agent (because it is harmful to animals). From chemical composition view point of *Chromolaena* indicated high quality of mulch material, because rate of decomposition and nutrient mineralization is affected by both nutrient content and chemical composition of the plant material (Abdullah, 2001; Bossuyt *et al*. (2001); Breland (1997). *Chromolaena* has a relatively high quality as compared to other weed species. It's leaves have a lower C/N ratio (25.8%) and C/P ratio (395), lower lignin (13.1%), ADF (53.3%) and cellulose (40.2%) content than common pastoral weed species (Abdullah, 2001).