



## Diversity and biomass production of fertilizer-stimulated pasture riparian wetland ecosystem in the dry season

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**ABSTRACT:** The swamp ecosystem has long been home to buffalo, cows, and other animals. Swamp conservation and restoration projects are crucial to preserving plant diversity and guaranteeing the food supply. Thus, this study aimed to evaluate the potential of inorganic fertilizers to promote plant diversity and to observe the revegetation of animal waste-derived plant diversity in the swamp during the dry season. The study was conducted from August 2021 to July 2022 in Rambutan Village (-3.123910, 104.937812), Indonesia. The stimulants used in this research were buffalo manure, NPK fertilizer and Urea fertilizer. The stimulant solution was once uniformly applied to the plots during the dry season. Soil pH for all plots was comparatively constant (4-6) during the research, while water pH varied from 3.7 to 6.5, and water level was 0-83 cm over 8 months. It was found that plots stimulated with manure, NPK, and urea fertilizer resulted in 13, 6, and 3 species, respectively. *Hymenachne amplexicaulis*, *Cyperus digitatus*, and *Sacciolepis interrupta* had the highest SDR values among the species identified in all plots. The yearly biomass generated by manure, NPK and Urea was 8.97 kg/m<sup>2</sup>, 3.01 kg/m<sup>2</sup>, and 2.08 kg/m<sup>2</sup>, respectively. Stimulants derived from buffalo manure promote faster growth and greater diversity.

**Keywords:** native forage grasses; inland marsh; wetlands; extensive livestock farming.

## Diversidade e produção de biomassa de pastagens estimuladas por fertilizante ecossistema de zonas úmidas ribeirinhas na estação seca

**RESUMO:** O ecossistema do pântano há muito que serve de lar para búfalos, vacas e outros animais do pântano. Para preservar a diversidade vegetal e garantir o fornecimento de rações, os projetos de conservação e restauro de zonas úmidas são cruciais. O estudo foi realizado de agosto de 2021 a julho de 2022 na aldeia de Rambutan (-3.123910, 104.937812), Indonésia. Os estimulantes utilizados nesta investigação foram o estrume de búfala, o fertilizante NPK e a Ureia. Durante a estação seca, a solução estimulante foi aplicada uniformemente nas parcelas. O pH do solo para todas as parcelas foi comparativamente constante (4-6) durante o levantamento, enquanto o pH da água variou de 3,7-6,5 e o nível da água de 0-83 cm ao longo de 8 meses. Verificou-se que as parcelas estimuladas com estrume, NPK e adubo de ureia resultaram em 13, 6 e 3 espécies, respectivamente. *Hymenachne amplexicaulis*, *Cyperus digitatus* e *Sacciolepis interrupta* apresentaram os valores mais elevados de SDR entre as espécies identificadas em todas as parcelas. A biomassa anual gerada pelo estrume, NPK e Ureia foi de 8,97 kg/m<sup>2</sup>, 3,01 kg/m<sup>2</sup> e 2,08 kg/m<sup>2</sup>, respectivamente. Os estimulantes derivados do estrume de búfalo promovem um crescimento mais rápido e uma maior diversidade.

**Palavras-chave:** ervas forrageiras nativas; pântano interior; áreas úmidas; pecuária extensiva.

### 1. INTRODUCTION

Wetlands known as swamps provide a special kind of agroecosystem when water from rivers or lakes overflows, either occasionally or continually, for three to six months out of the year, at a depth that ranges from 50 to more than 150 cm (ALWI; TAPAKRISNANTO, 2017). The water levels fluctuate according to the seasons, becoming progressively lower during the dry season and higher or even flooded during the rainy season.

Since large-scale plantations developed, swamps have undergone hydrological changes that have altered the pattern of height and duration of water inundation (MA et al., 2019).

The types and growth of different plants are greatly influenced by the flooding and drying of water in swamp areas; a limited variety of plants were found in the dry season (AFRIANI et al., 2023). The changes of flooding duration from up to six months to only one month in the swamp area during the rainy season have resulted in the dominance of *Imperata cylindrica* (IKHSAN et al., 2020). The long dry season is also a factor causing few plants and grass to be able to live in swamp areas.

Naturally, plant species in swamps remain unchanged year after year. Swamp environments are home to swamp buffalo and other cattle because they are abundant with grass

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