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Tiger Grass Productivity in Bamboo-Based Agroforestry: The Role of Bamboo Stand Age

S&T in Natural Resources

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Key Findings and Policy Implications

- Bamboo when planted as a single crop particularly at its early stage of growth has a wide space between them. Such space can be devoted to agricultural crops production and productivity can be increased when the spaces in between the plants will be planted to crops particularly those that can thrive under partially shaded conditions without much reduction in the production of the component crop.
- Soil nutrient levels and moisture retention were higher in mid-aged bamboo stands, supporting better growth conditions.
- Understanding this relationship can guide agroforestry farmers and policymakers in optimizing land use for improved economic and environmental benefits.
- Tiger grass performed best in mid-aged bamboo stands, where canopy cover and soil conditions were optimal.
- Young bamboo stands provided less shade and soil stability, resulting in higher tiger grass productivity.
- Agroforestry systems should consider bamboo stand age as a key factor in tiger grass cultivation.

Background

Tiger grass (*Thysanolaena maxima*) is a valuable non-timber forest product (NTFP) widely used for broom-making and other commercial applications.

Tiger grass thrives in agroforestry systems, particularly those involving bamboo. It serves as hedge grow, which controls erosion and good in rehabilitating degraded areas as it helps retain ground moisture and promotes soil fertility. It is also grown as viable livelihood venture because of its potential in generating cash income from the harvested panicles of the plant when proper management is employed.

Research Objectives

- Assess the productivity of tiger grass in relation to different bamboo stand ages.
- Determine the optimal bamboo stand age for maximizing tiger grass yield.
- Provide recommendations for sustainable bamboo-based agroforestry practices.

Methodology

The study was conducted in a Randomized Complete Block Design (RCBD) experiment at the bamboo plantations of Cagayan State University in Gonzaga, Philippines. The study compared the effects of different bamboo plantation ages (3, 5, and 7 years) on the growth of tiger grass. Soil samples were collected for analysis of organic matter, phosphorus, and potassium. Land preparation included strip brushing, followed by staking and hole digging to ensure proper plant spacing.

Tiger grass planting materials were prepared from clumps, with tillers propagated in polyethylene bags. The propagated tillers were then planted in a mixture of topsoil and organic fertilizer.

Mulching was applied to conserve moisture and suppress weeds. The plants were managed with fertilization, weeding, and protection from animals. Panicles were harvested when they reached approximately 70 cm in length and were still green and soft.

Key Findings

The T1 (3 years bamboo plantation) treatment led to the highest yields for tiger grass across all metrics, including the highest average weight of panicles (699.21 g) and the most productive tillers (39.04 per hill). In contrast, older bamboo plantations (T2 and T3) were associated with significantly lower yields for the tiger grass.

Table 1. Parameters obtained by tiger grass after six (6) months.

Treatments	Average Number of Panicles	Average weight (g) of Panicles	Averange Number of Tillers Per Hill	Average Number of productive Tillers Per Hill
T1 - 3 years bamboo plantation	17.41 a	699.21 a	56.77 a	39.04 a
T2 - 5 years bamboo plantation	5.74 b	232.41 b	11.11 b	5.38 b
T3 - 7 years bamboo plantation	5.04 b	0.498 b	11.41 b	6.38 b

Conclusion

The incorporation of 800 hills of tiger grass during the early years (1.5-4yrs) of bamboo plantation establishment will contribute an annual average of 13,200pcs tiger grass panicles or 112 brooms. It has a total value of Php67,200.00 for four years. This will surely an additional annual income for established bamboo plantations in North-eastern Cagayan.

This strategy requires strategic planning based on bamboo stand age. By integrating tiger grass with mid-aged bamboo stands, farmers can enhance productivity, environmental sustainability, and economic returns.

Policymakers and institutions should support research and education to promote sustainable agroforestry systems.

Policy Recommendations

1. It is recommended to utilized the bamboo spaces from the 1.5 years up to 4 years as a component to bamboo-based agroforestry.
2. Adopt Age-Based Agroforestry Management which means farmers should align tiger grass planting with mid-aged bamboo stands.

3. Provide Technical Assistance; this could include, Agricultural and forestry agencies should educate farmers on best management practices.
4. Promote Further Research through additional studies should assess long-term productivity and soil health in different bamboo-based agroforestry systems.

Target Policy Actors and Beneficiaries

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Editor's Note

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