SURVIVAL AND CULM YIELD OF 6 BAMBOO SPECIES IN A 5-YEAR EXPERIMENTAL STAND IN SOUTHERN BRAZIL

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OUTLINE

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2. RATIONALE
3. STUDY SITE
4. EXPERIMENTAL DESIGN
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Western Amazon Natural Dense Bamboo Forest: 9 M ha

Northeast: Large-scale Bamboo Plantation: 30,000 ha

137 species

HIDALGO LÓPEZ (2003)
RATIONALE

1. NATIONAL POLICY OF INCENTIVE TO BAMBOO SUSTAINABLE MANAGEMENT AND CULTIVATION (BRASIL 2011).

2. USE: EXTRACTION FROM NATURAL STANDS OR ISOLATED PLANTED CLUMPS, IN SMALL SCALE;

3. ONLY ONE LARGE-SCALE REFORESTATION INITIATIVE FOR PULP AND PAPER;

4. LACK OF BASIC DATA ON SPECIES YIELD PERFORMANCE: NO EXPERIMENT!
RATIONALE

OBJECTIVE:

• ESTABLISH THE FIRST EXPERIMENTAL TEST OF BAMBOO SPECIES IN SOUTHERN BRAZIL;

• COLDER THAN THE REST OF THE COUNTRY: WARM-TEMPERATE TO SUBTROPICAL;

• USE OF A STATISTICALLY VALID EXPERIMENTAL DESIGN;

• NATIVE AND INTRODUCED SPECIES.
• Pinhais University Farm;
• Established December 2008;
• 25°23'30"S and 49°07'30";
• Subtropical Cfb;
• Monthly temperatures: 12.5 to 22.5°C;
• Altitude: 889 to 950 m asl;
• Soil classes: Sugamosto (2002).
EXPERIMENTAL DESIGN

Block 4

Block 3

Block 2

Block 1

T1 Guadua chacoensis
T2 Guadua angustifolia

T3 Merostachys skvortzovii
T4 Dendrocalamus asper

T5 Bambusa vulgaris
T6 Bambusa oldhamii

pachymorph
• Every year: from 2009 to 2014, in August;
• Mortality, re-sprouting, frost damage, other events;
• Measurement of all culms and new shoots;
• Base perimeter, coverage area, total height (length), culm density (number), base diameter, diameter at breast height (dhh);
• Other events.
DATA ANALYSIS

• Survival %;
• Culm density;
• Apparent basal area: calculated from dbh;
  • Apparent volume;
• Biomass (dry mass);
• Carbon stock;
• Wood properties.
• Descriptive stats;
• Normality;
• Homogeneity of Variance;
• Analysis of Variance;
• Test of Tukey at 0.05 probability;
• Modeling volume, biomass, carbon;
• Data Mining and AI approaches.
TREATMENTS
Native:
T1 - *Guadua chacoensis* Londoño & Peterson;
T2 - *Guadua angustifolia* Kunth;
T3 - *Merostachys skvortzovii* Sendulski;
Exotic:
T4 - *Dendrocalamus asper* (Schult. & Schult. F.) Backer ex k. Heyne;
T5 - *Bambusa vulgaris* Schrad. ex J.C. Wendl., and;
T6 - *Bambusa oldhamii* Munro.
RESULTS AND DISCUSSION

- **Survival:** *Guadua angustifolia, Bambusa vulgaris* and *Bambusa oldhamii*;
- **Culm density:** *Merostachys skvortzovii* and *Bambusa oldhamii*;
- *Merostachys skvortzovii*: great sprouting capacity, but small-sized culms;
- *Bambusa oldhamii*: good sprouting, and large-sized culms;
- **Apparent basal area:** *Bambusa oldhamii*. 
RESULTS AND DISCUSSION

• No published research on survival and growth of *Bambusa oldhamii* in Brazil;

• Most of the commercial plantations: *B. vulgaris* (N & NE), pulp and paper industry (Cechinel Filho & Yunes 1998; Resende et al. 2011);

• *B. oldhamii*: better performance in terms of survival and growth in 5 years;

• Recommended for further studies: growth and use (biomass, wood properties, etc.).
**FINAL REMARKS**

- *Bambusa oldhamii* (T6): greatest growth performance - survival, density and basal area;
- Species resilient to the colder climate of Southern Brazil;
- Good sprouting: large-sized culms suitable for use;
- *Merostachys skvortzovii* (T3): native species for used in revegetation of degraded lands, due to its adaptation and capability to form dense clumps.
Biomass and Carbon Sink Research Center

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THANK YOU

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