

41723

SP
5555

Tropentag 2009:

Biophysical and Socio-economic Frame Conditions for the Sustainable Management of Natural Resources

October 6 - 8, 2009, Hamburg, Germany

General information

The annual Conference on Tropical and Subtropical Agricultural and Natural Resource Management (TROPENTAG) is jointly organised by the universities of Bonn, Göttingen, Hohenheim, Kassel-Witzenhausen, Hamburg, Zürich (2010) as well as by the Council for Tropical and Subtropical Research (ATSAF e.V) in co-operation with the GTZ Advisory Service on Agricultural Research for Development (BEAF).

Tropentag 2009 will be held in Hamburg. All students, Ph.D. students, scientists, extensionists, decision makers, politicians and practical farmers, interested and engaged in Agricultural Research and Rural Development in the Tropics and Subtropics are invited to participate and to contribute.

Target of the conference

The Tropentag is a development-oriented and interdisciplinary conference. It addresses issues of resource-, environmental-, agricultural-, forestry-, fisheries-, food-, nutrition and related sciences in the context of international rural development, sustainable resource use and poverty alleviation worldwide.

Plenary sessions

Growing world population and resource depletion lead to social and economic conflicts. In order to guarantee security with respect to food safety, life quality and health the urgent need for integrated management of our environment is obvious.

The frame condition for development of life security becomes more and more restricted due to the ongoing economic crisis and unforeseen changes in climatic conditions. Locally and regionally adapted stable production systems are one way to lower the dependence on international markets.

The main aim of achieving the UN Millennium Goals is the development of regionally adapted food production based on integration of local knowledge and local resources.

Invited speakers will present their view and analysis on these subjects.

The topics addressed at the Tropentag 2009 conference will supply the analysis of the state of the art of future environmentally sound developments.

Eiselen award plenary session

On the occasion of this conference a special plenary session will be devoted to the presentation of the

"Hans H. Ruthenberg-Graduate-Award" " by the "Eiselen Foundation", Ulm.

Oral and poster presentations

The Tropentag 2009 entitled "Biophysical and Socio-economic Frame Conditions for Sustainable Management of Land Resources and Water Bodies " particularly welcomes contributions pertaining to one of the following topics:

- Desertification - sustainable management
- Natural Resources - soil and water
- Diversity
- Crop science and land use
- Animal sciences
- Forest management and perennial crops
- Economics and socioeconomy

The Tropentag 2009 will be organised in seven sessions of four parallel thematic groups. Each session will be opened by an invited keynote lecture, to be followed by four original papers.

Posters contributing to the different topics will be introduced during a plenary session on the first day at early evening time. On the second day there will be two parallel guided poster sessions around lunch time.

Phone and internet

There will be a phone line for the conference from tuesday, 6-10-2009 until Thursday, 8-10-2009:
(+49) 40 42838 4444 - fax (+49) 40 42838 5555

Participants of the conference will be provided with a WLAN-access to the internet from Monday to Thursday.

Local organising committee

- Prof. Dr. Norbert Jürgens (conference president)
 - Prof. Dr. Michael Köhl
 - Prof. Dr. Jörg Ganzhorn
 - Prof. Dr. Reinhard Lieberei (head of local organising committee)
 - Carsten Schmechel (accountant)
-



SP
5555

91773

Tropentag 2009
University of Hamburg, October 6-8, 2009

Conference on International Research on Food Security, Natural
Resource Management and Rural Development

Energetic potential of *Sclerolobium paniculatum* Vogel (taxi-branco) and its preferential top climatic condition in Eastern Amazonia, Brazil

Silvio Brienza Júnior^a; Daiana C. A. Monteiro^b; Lucieta G. Martorano^a; Leila S. Lisboa^c, Mayra P. Maestri^b and Azeneth Schuler^d

a Embrapa Eastern Amazon, Cx. Postal 48, 66095-100, Belém, Pará, Brazil. Email: brienza@cpatu.embrapa.br and luty@cpatu.embrapa.br

b Student of the Eng^o Florestal da University Federal Rural of the Amazonia – UFRA, Belem, Pará, Brazil (Scholarship holder of the ITTO)

c Supported by Museum Emílio Goeldi grant. Belém, Pará, Brazil. Email: leilasheila@gmail.com

d Embrapa Soil, Rio de Janeiro, RJ. Brazil. Email: marysolschuler@gmail.com

Introduction

The slash-and-burn agriculture practiced in the Eastern Amazon of Brazil uses rudimentary technology offering little opportunity for the small landholder to accumulate capital and to improve livelihood. Moreover, the lack of adequate agricultural policies, demographic growth, the division of the family's land and consequently its intensified use, and the new market for agricultural products have contributed to the shortening of the fallow periods. The results are a loss of nutrients and decrease in soil fertility due to insufficient time for the accumulation of fallow vegetation biomass. These factors are providing land use instability, resulting in abandoned areas. In the long run, this will bring the slash-and-burn system to collapse. Fallow management or land reclamation must, is an important key in the Brazilian Amazon region considering that 700 km² are deforested (Inpe, 2009) and about 19,82% of the opened area are degraded (Almeida, 2008). The planting of fast growing trees for different purposes (wood, charcoal, biomass, among others) can optimize property income and could be a promising means to alleviate the pressure on the primary forest and allow its conservation.

Sclerolobium paniculatum Vogel (taxi-branco) is a leguminous tree (Fabaceae) and presents a great potential for energy production. Fast growth and charcoal characteristics similar to eucalyptus encourage plantations using this species for rehabilitation of degraded areas, especially in areas of legal reserve in accordance with Brazilian legislation for the Amazon.

This study aimed to georeference the natural occurrence of taxi-branco and integrate with bio and top-climate information in order to make safer its plantations for land reclamation.

Material and Methods

The natural occurrence of taxi-branco (*Sclerolobium paniculatum* Vogel) in the Brazilian Amazon has been identified from data available in the literature considering the location and information on floristic surveys documented in herbaria from Embrapa Eastern Amazon and Emílio Goeldi Museum. With the information obtained it was identified areas bio and top-climate preferred for taxi-branco using GPS (Global Position System) and ArcGIS 9.3. Based on data from air temperature, rainfall and sunshine hours were produced water balance using a soil water storage capacity (SWSC) 300 mm on spreadsheets provided by Rolim & Sentelhas (1998) based on the method of Thornthwaite & Mather.

After the development of water stress map, information concerning of natural occurrence and plantation of taxi-branco were spatialized. In the new map was identified the following points: natural occurrence of taxi-branco; plantation taxi-branco (GPS); municipalities regarding the natural occurrence; and municipalities regarding the plantation of taxi-branco.

In the present study were also incorporated information from 13 experimental units on family farms located in the municipalities of Bragança, Capitão Poço and Garrafão do Norte (State of Para) which are monitored since 2007 under the project "Conservation and recovery of degraded land in family agriculture units in the Eastern Brazilian Amazon" which is executed by Embrapa Amazônia Oriental with financial support from the International Tropical Timber Organization (ITTO).

Results and Discussion

The most rain areas in the Eastern Amazon are in the range between 3,000 to 3,100 mm and the lowest rainfall values are between 1,600 to 1,700 mm (Figure 1). The variation of mean air temperature is 24.0 to 27.5°C (Figure 2).

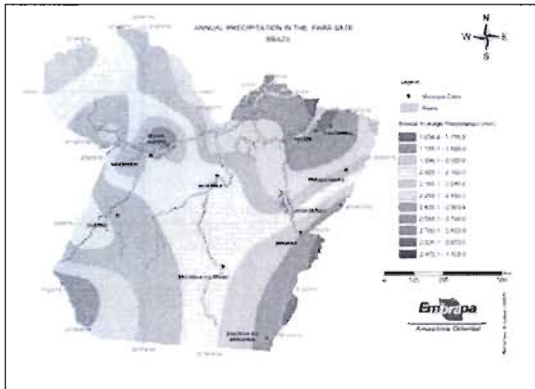


Figure 1. Annual pluvial precipitation in the Eastern Amazon

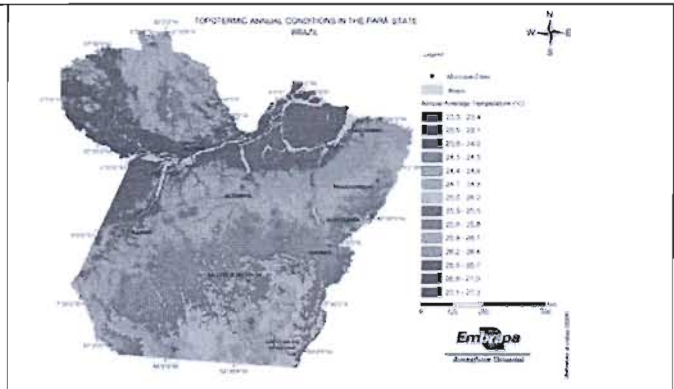


Figure 2. Topotermic conditions in the Eastern Amazon

Using all the information collected we produced a map showing the best regions for planting taxi-branco (Figure 3). As the taxi-branco occurs in upland and low land (floodplain), it was observed that the species prefers areas predominantly top bio-climate with water deficit between 150 to 250 mm and elevations below 200 m altitude (Figure 3).

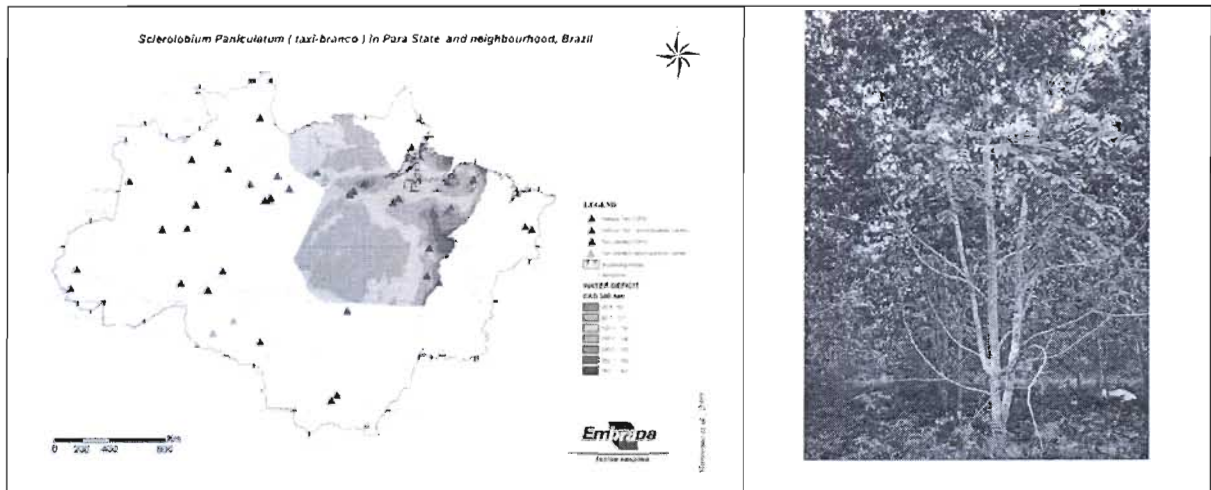


Figure 3. Water deficit conditions in the Eastern Amazon (State of Para) and energetic potential of *Sclerolobium paniculatum* Vogel (taxi-branco)

Conclusion and outlook

This date evidence that the municipalities of Garrafão do Norte and Capitão Poço are the better areas for taxi-branco plantations according to top- bioclimate conditions. The knowledge of these zones should enhance the confidence degree on the areas indicated to the development of strategies for the genetic resources conservation and sustainable management of threatened tree species.

References

ALMEIDA, C. A. 2008. Estimativa da área de ocorrência e do tempo de permanência da vegetação secundária da Amazônia Legal com imagens TM/Landsat. 2008. Instituto Nacional de Pesquisas Espaciais. Dissertação (Mestrado em Sensoriamento Remoto).

BRIENZA JUNIOR, S.; SÁ, T.D. de A. Sistemas Agroflorestais na Amazônia Brasileira: Espécies Arbóreas e atributos desejáveis. Pag. 357- 373 In: Anais do I Congresso brasileiro sobre sistemas agroflorestais. Colombo: Embrapa- CNPF, 1994. 522p. (Embrapa. CNPF. Documentos, 27).

INPE. Instituto Nacional de Pesquisa Espacial. 2009. São José dos Campos, São Paulo. <http://www.dpi.inpe.br/prodesdigital/prodesmunicipal.php>. Acessado em 04/04/2009.

LIMA, R. M. B. de Crescimento do *Sclerolobium paniculatum* Vogel na Amazônia, em função de fatores de clima e solo. (Tese de Doutorado), Curitiba, 2004.

MOCHIUTTI, S.; MELÉM JUNIOR, N.J; FARIAS NETO, J.T. de; QUEIROZ, J.A.L. de Taxi-branco (*Sclerolobium paniculatum* Vogel.): Leguminosa arbórea para a recuperação de áreas degradadas e abandonadas pela agricultura migratória. **Comunicado Técnico** n°28, p.1-5. Embrapa-Amapá, 1999.

ROLIM, G. de S.; SENTELHAS, P.C.; BARBIERI, V.. Planilhas no ambiente EXCEL para o cálculo de Balanços Hídricos: Normal, Sequencial, Cultura e Produtividade Potencial e Real. **Revista Brasileira de Agrometeorologia**, Santa Maria- RS, v. 6, n. 1, p. 133-137, 1998.

TOMASELLI, I.; MARQUES, L. C. T.; CARPANEZZI, A. A.; PEREIRA, J. C. D. Caracterização da madeira de taxi-branco-da-terra-firme (*Sclerolobium paniculatum* VOGEL) para energia. **Boletim de Pesquisa Florestal**, Colombo, n. 6/7, p. 33-44, Jun./Dez.



Energetic potential of *Sclerolobium paniculatum* Vogel (taxi-branco) and its preferential top climatic condition in Eastern Amazonia, Brazil

Silvio Brienza Júnior^a; Daiana C. A. Monteiro^b; Lucieta G. Martorano^a; Leila S. Lisboa^c,
Mayra P. Maestri^b and Azeneth Schuler^d

INTRODUCTION

The *Sclerolobium paniculatum* Vogel (taxi-branco) is a leguminous tree (Fabaceae) and presents a great potential for energy production. Fast growth and charcoal characteristics similar to eucalyptus encourage plantations using this species for rehabilitation of degraded areas, especially in areas of legal reserve in accordance with Brazilian legislation for the Amazon. Although the taxi-branco occurs in the Brazilian Amazon, the establishment of commercial plantations can be improved based on genetic breeding, silvicultural treatment and identifying the bio-top preferred areas.

MATERIAL AND METHODS

In the municipalities of Bragança, Capitão Poço and Garrafão do Norte (State of Para), Eastern Brazilian Amazon, since 2007, is monitored the potential energy of the taxi-branco in the recovery of degraded areas.



Figure 1. Degraded Areas - Para State (Project PD 346/05 Rev. 2)

Systems of mixed forest species, with different periods of harvest, were planted with 13 families of farmers. The average size areas is 0.36 ha and the used silvicultural model is presented in Figure 2.

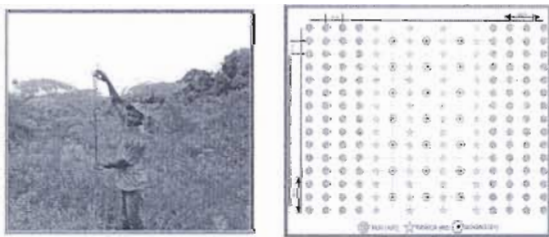


Figure 2. The used silvicultural Model mixing 150 to 200 trees of *Sclerolobium paniculatum* Vogel (taxi-branco); *Schizolobium amazonicum* Huber ex Ducke (paricá); *Swietenia macrophylla* King. (Brazilian mahogany - mogno).

This study aimed to georeference the natural occurrence of taxi-branco and integrate bio-top information to indicate, with greater certainty, plantations for rehabilitation of degraded areas. The used informations covered data from natural occurrence of taxi-branco available in the literature, the herbaria of Embrapa Eastern Amazon and the Museum Paraense Emilio Goeldi and 13 demonstrative units in the Eastern Amazon. Data from normal weather with spatial resolution were spatialized in Arcgis 9.3 and exported to the TerraView 3.2, to create the space for cellular integration of variables in TerraMe and to generate of topo-bioclimate maps.

RESULTS AND DISCUSSION

The most rainy areas in the Eastern Amazon are in the range between 3000 to 3100 mm and the lowest rainfall values of between 1600 to 1700 mm (Figure 3). The variation of mean air temperature is 24.0 to 27.5°C (Figure 4). Using all the information collected we produced a map showing the best regions for planting taxi-branco (Figure 5).

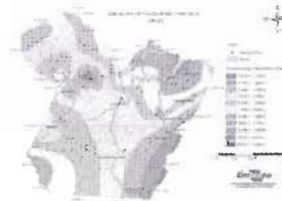


Figure 3. Annual pluvial precipitation in the Eastern Amazon

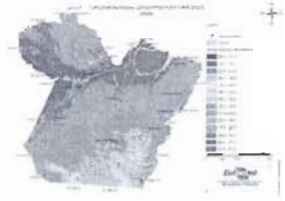


Figure 4. Topotermic conditions in the Eastern Amazon

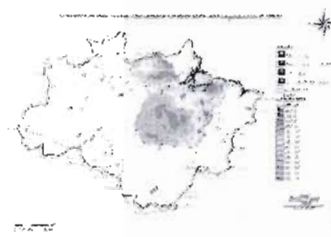


Figure 5. Water deficit conditions in the Eastern Amazon (Para State) and Energetic potential of *Sclerolobium paniculatum* Vogel (taxi-branco)

As the taxi-branco occurs in upland and low land (floodplain), it was observed that the species prefers areas predominantly top bio-climate with water deficit between 150 to 250 mm and elevations below 200 m altitude (Figure 5).

CONCLUSION AND OUTLOOK

This date evidence that in Garrafão do Norte and Capitão Poço are the better areas in the project monitoring according to topo-bioclimate conditions. The knowledge of these zones should enhance the confidence degree on the areas indicated to the development of strategies for the genetic resources conservation and sustainable management of threatened tree species.

^a Embrapa Eastern Amazon, Cx. Postal 48, 66095-100, Belem, Para, Brazil. Email: brienza@cpatu.embrapa.br and luty@cpatu.embrapa.br

^b Student of the Forest Engineering of the University Federal Rural of the Amazonia - UFRA, Belem, Para, Brazil (Scholarship holder of the ITTO)

^c Supported by Museum Emiglio Goeldi grant. Belem, Para, Brazil. Email: leilasheila@gmail.com