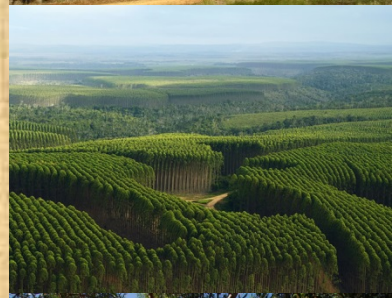
Southern Forest Nursery Management Cooperative

AUBURN UNIVERSITY



Eucalyptus Depth Study

Daniel Cury Spolidorio

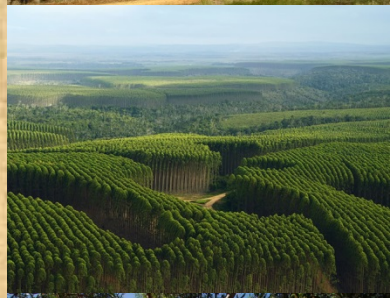
Tom Starkey

Barry Brooks

November - 2013

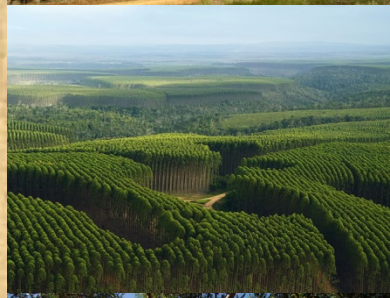
Summary

- Introduction – Who am I?
- Research studies
- Specific activities
- Understanding the Southern US Culture
- Eucalyptus Depth Study


Introduction

- I am from Piracicaba, Sao Paulo – Brazil in South America;



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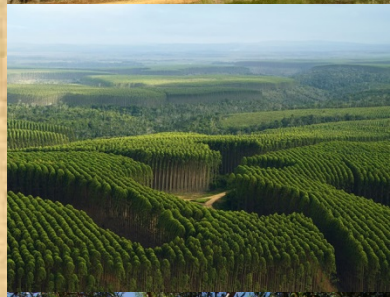
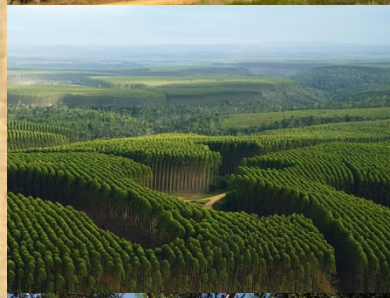


Introduction

- I am from Piracicaba, Sao Paulo – Brazil in South America;
- I am undergraduate student (Senior) in Forestry at University of Sao Paulo State;
- I will graduate in December, 2013;
- The center of my life is my family, girlfriend and friends;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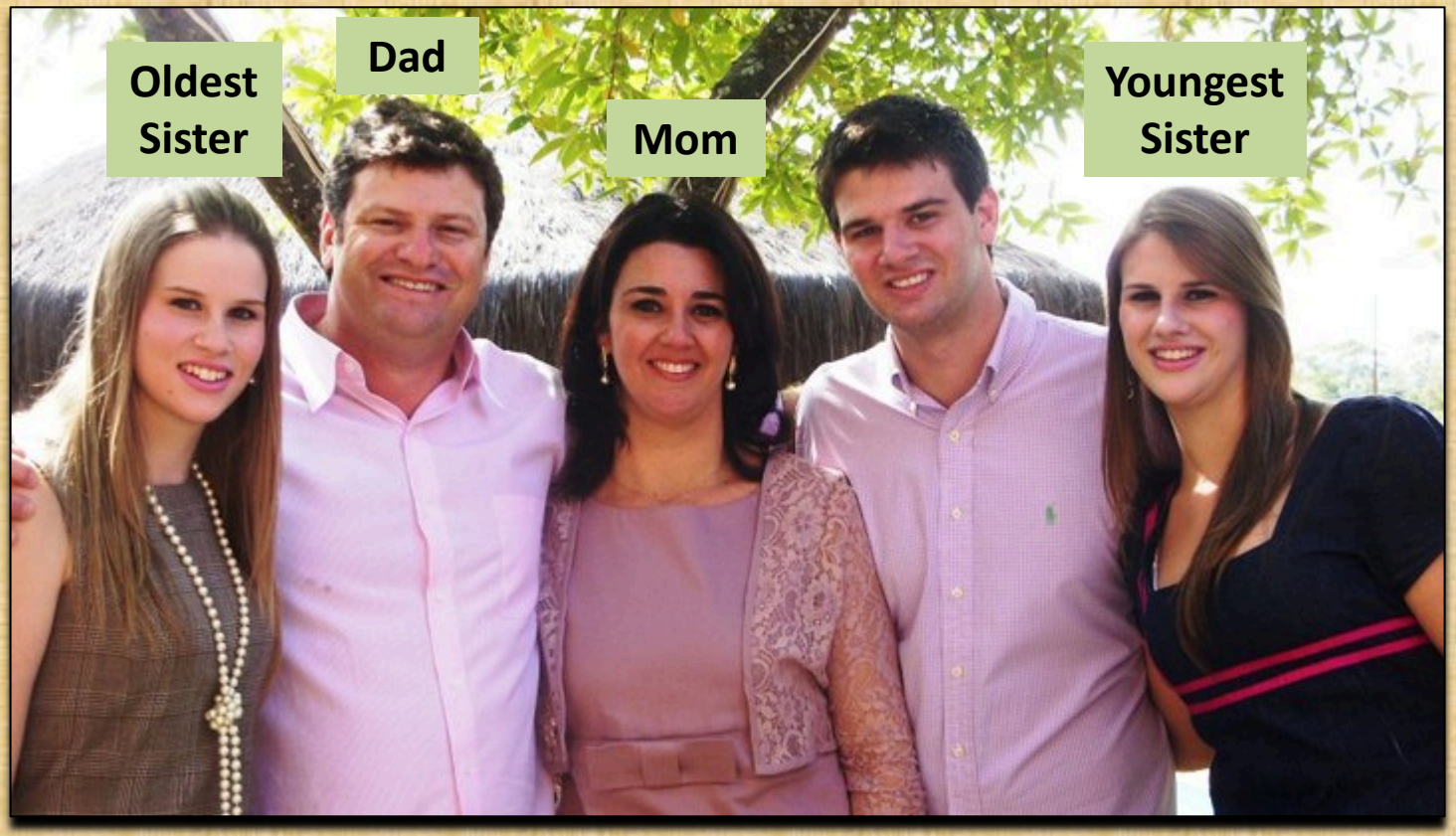
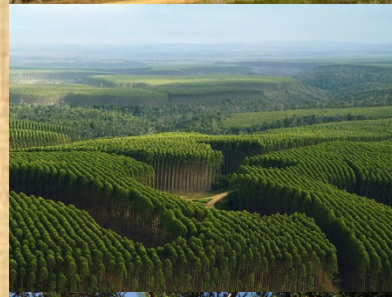
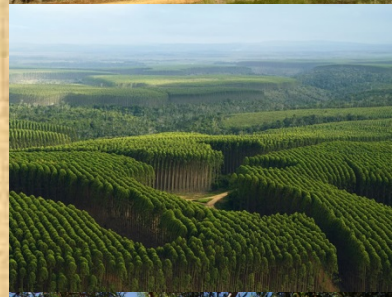
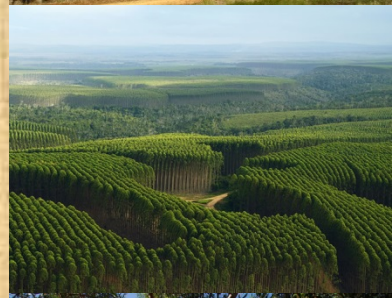




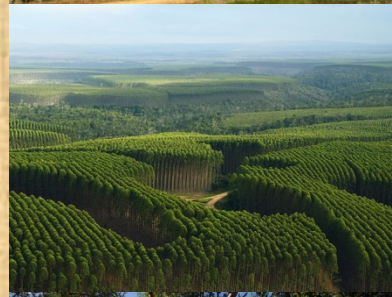
Introduction





Introduction

- My sport in Brazil is Motocross – Endurance/Cross Country;



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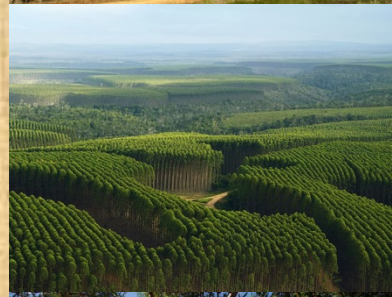
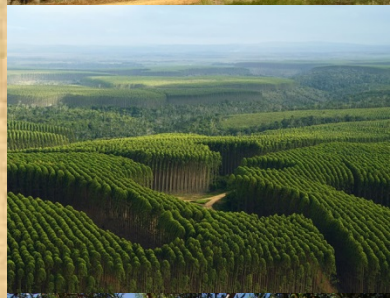


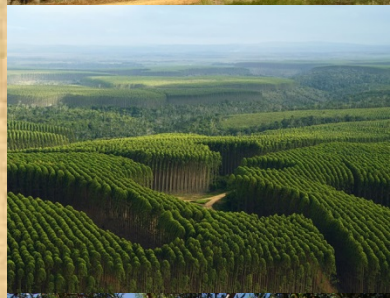
Summary

- Introduction ✔
- Research studies
- Specific activities
- Understanding the Southern US Culture
- Eucalyptus Depth Study


Research studies with which I assisted at Auburn University

- Eucalyptus Depth Study;
- Seed Polymer Study;
- Soil Moisture Profile Study;
- Longleaf Pine Root Development Study;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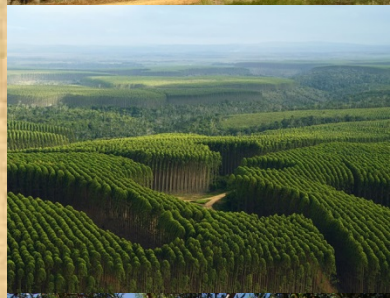
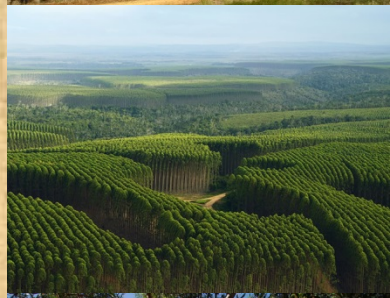



Specific activities

- Technical Visits to Nurseries (AL, GA, MS and TN);
- Evaluate Experiments;
- Measure Seedlings;
- Build Plexiglass Boxes for Loblolly Root Morphology Study;
- General Support for Other Activities;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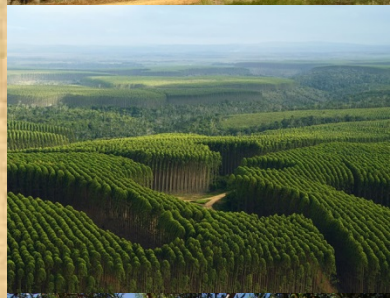
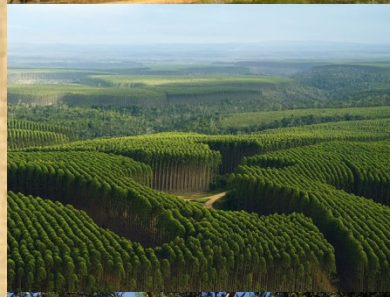


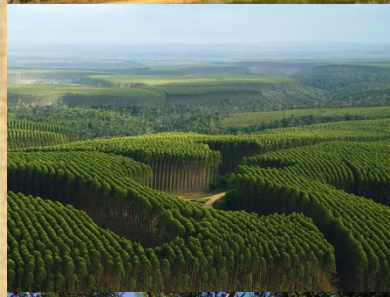

Understanding the Southern US Culture

- Football - War Eagle!



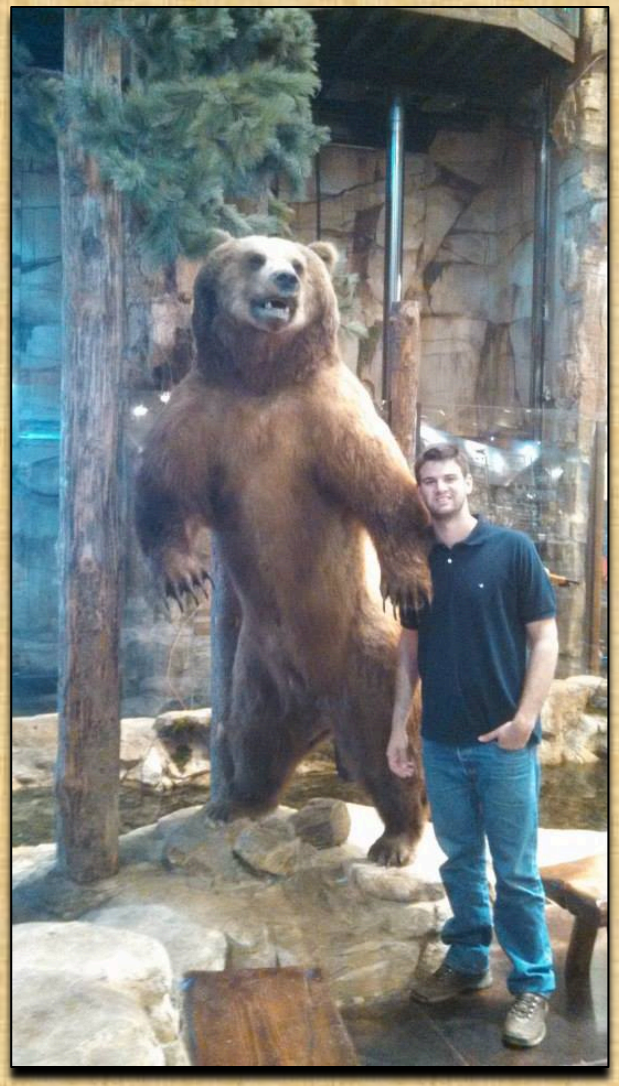
Understanding the Southern US Culture

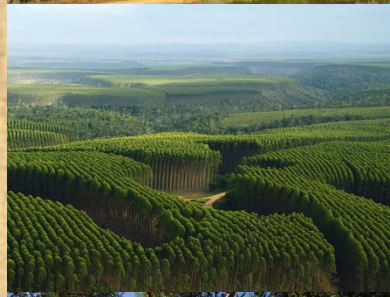
- Fishing



Understanding the Southern US Culture

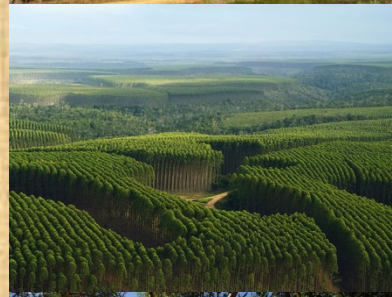
- Bass Pro Shops





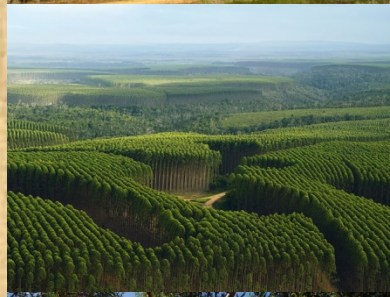
Understanding the Southern US Culture

- Feed Turkeys with Scott



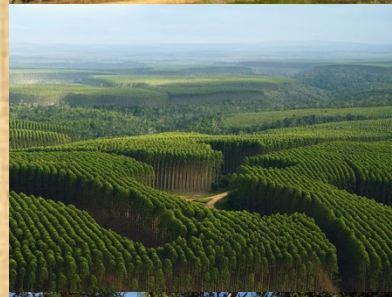
Understanding the Southern US Culture

- American Motocross with Tom



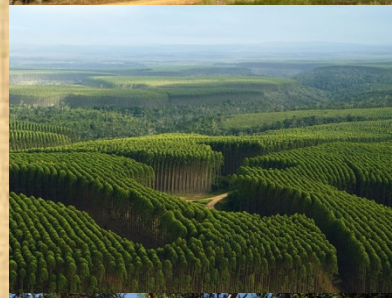
Understanding the Southern US Culture

- Camping at the Smoky Mountains



Understanding the Southern US Culture

- Eating hot boiled peanut
- Correct pronunciation of: “Okefenokee Swamp”



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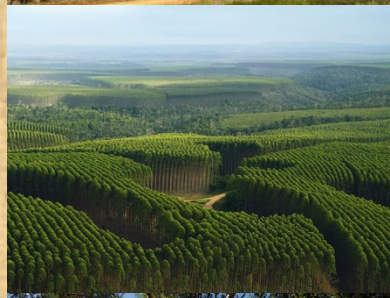
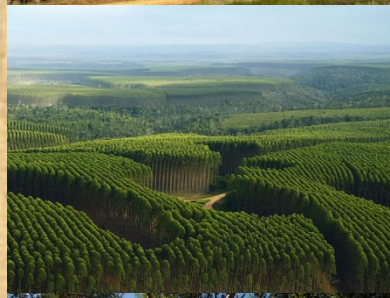



Eucalyptus Depth Study

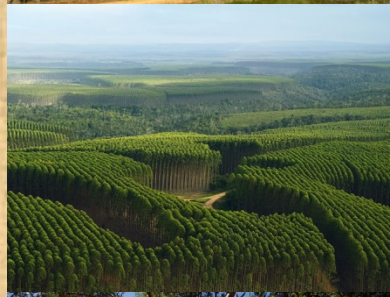


Eucalyptus Depth Study

Introduction

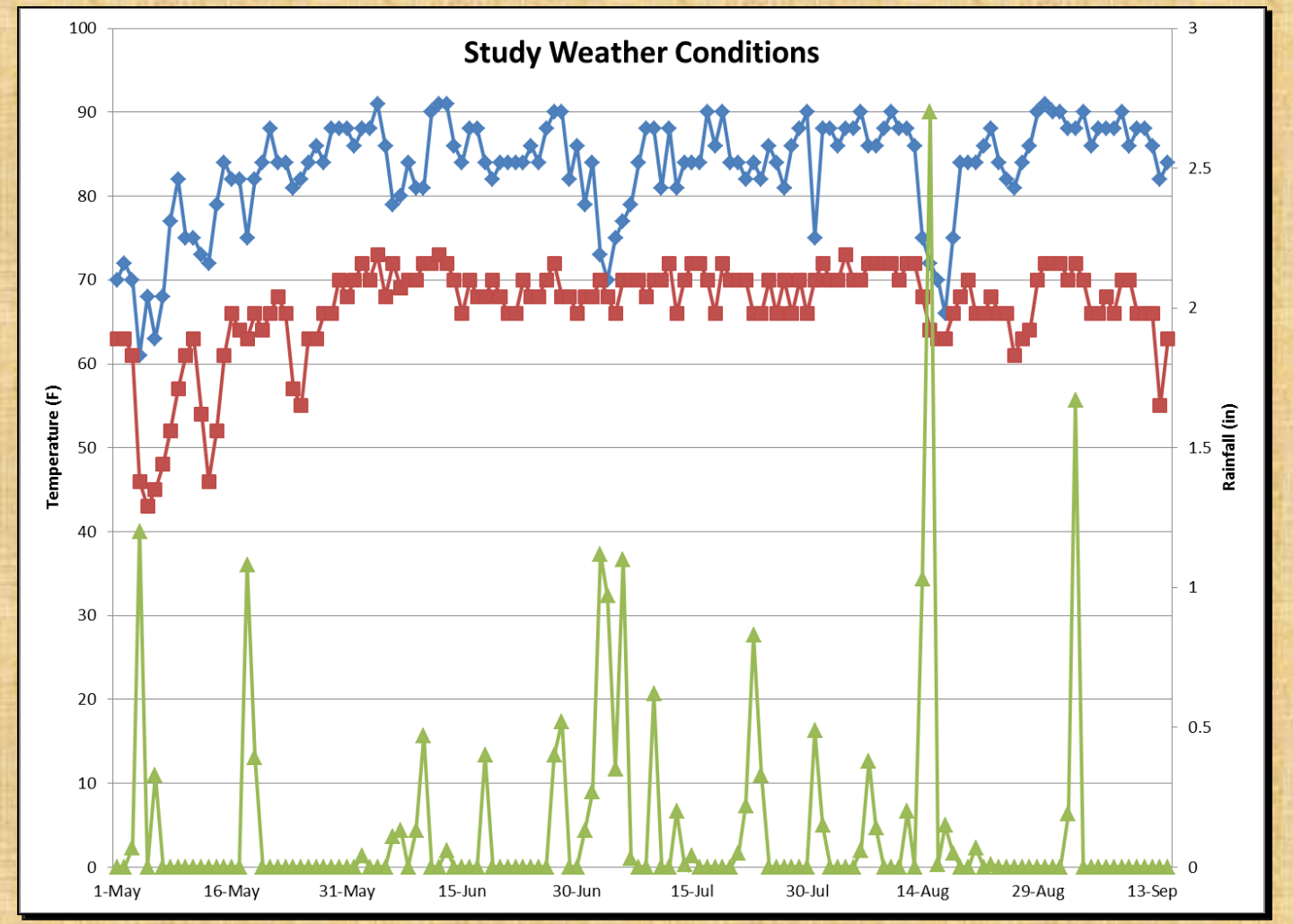
- There are 2 locations for study:
  - Trophatron (open enviroment)
    - 19” – 22”of rain (May – September)
  - Stress Boxes (controlled enviroment)
    - < 3” of rain (No irrigation/rainfall since May 15)

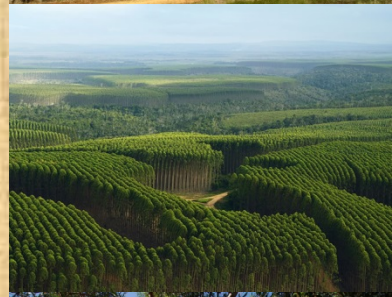
    Deep planting = 9” (1/2 seedling height)



Eucalyptus Depth Study

Trophatron Weather

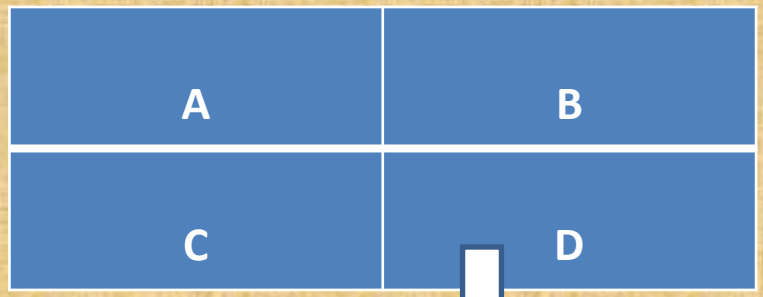




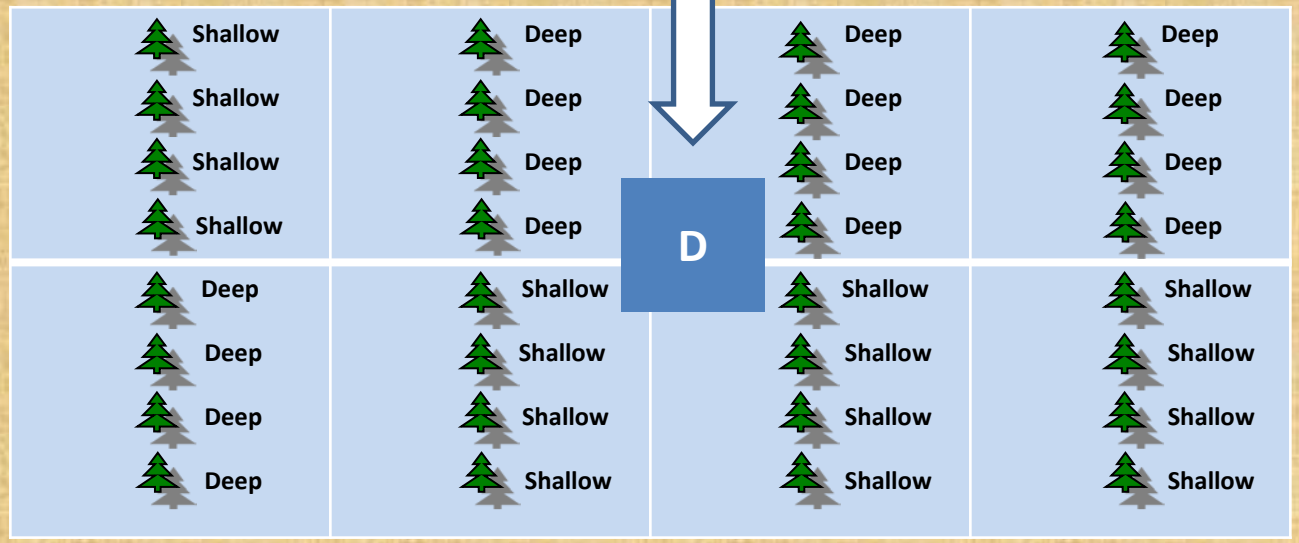
Eucalyptus Depth Study

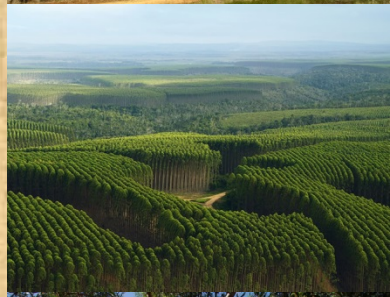
Trophatron

- There are 4 blocks (A, B, C and D): Total = **128 seedlings**



- In each block, there are 8 plots:





Eucalyptus Depth Study

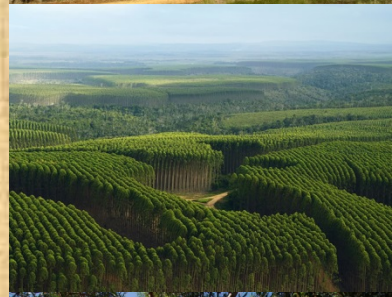
Trophatron

- Measured the height and diameters (ground line) of seedlings.

  1) Planting (5/1/2013);

  2) 3 months after planting (7/31/2013);

  3) 4 months after planting (9/9/2013);



Eucalyptus Depth Study

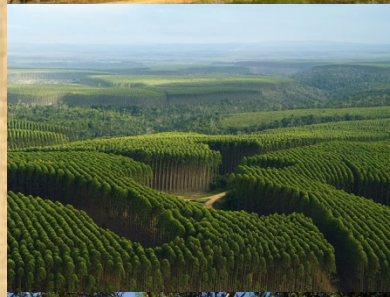
Results Trophatron

1. Average

	May			July			September		
	Ht (cm)	GLD (mm)	Vol (c	Ht (cm)	GLD (mm)	l (cc	Ht (cm)	GLD (mm)	Vo cc)
Shallow	19.1*	5.2*	4.2*	61.3	7.0	25.3	71.8	8.1	43.7
Deep	13.3*	3.3*	1.1*	60.5	6.3	20.9	80.1	8.4	54.1

* Denotes significant difference

	DryWt (g)
Shallow	17.0
Deep	34.8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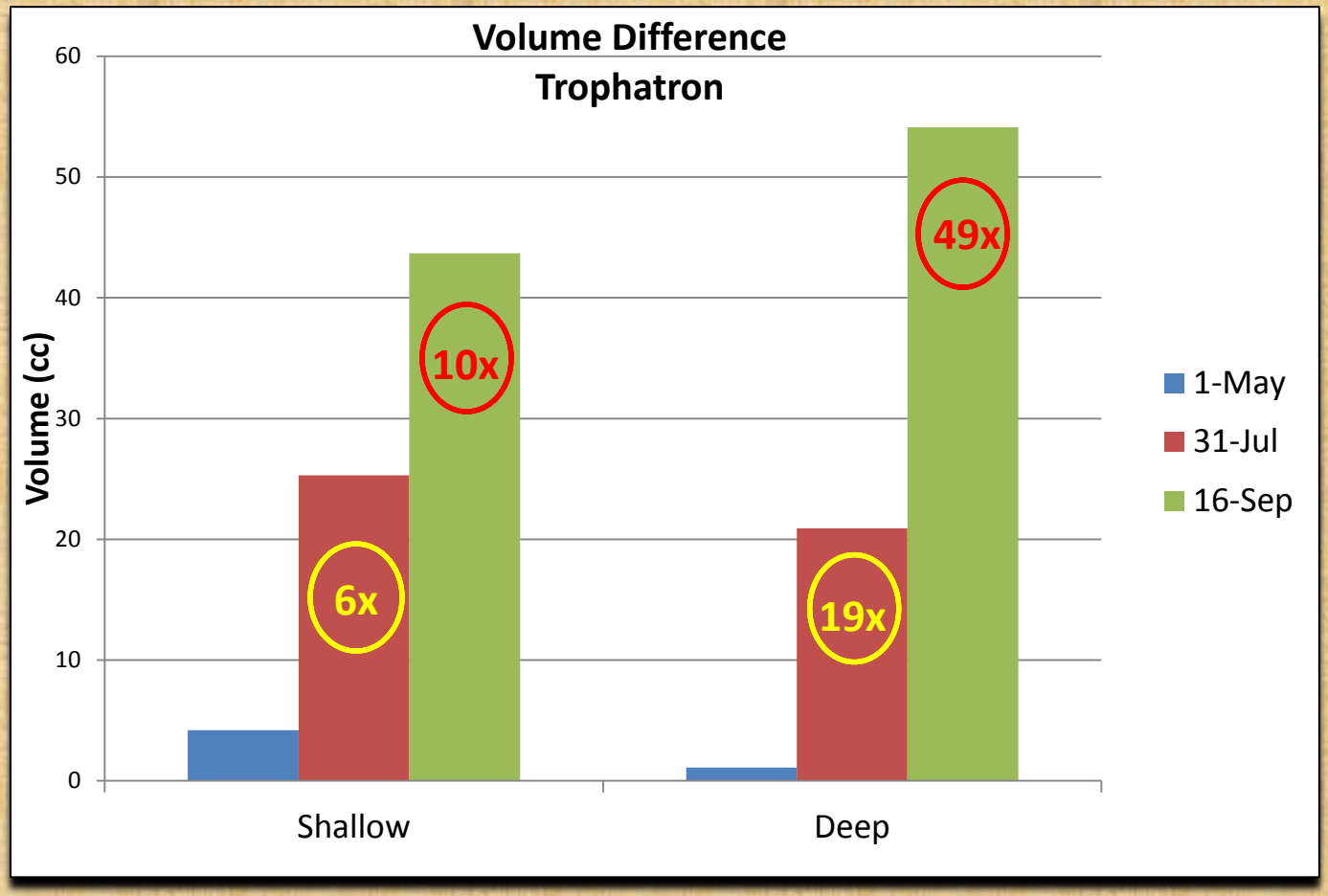
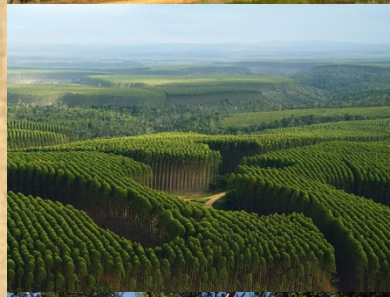
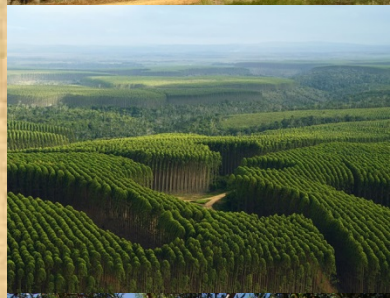




Eucalyptus Depth Study

Discussion Trophatron

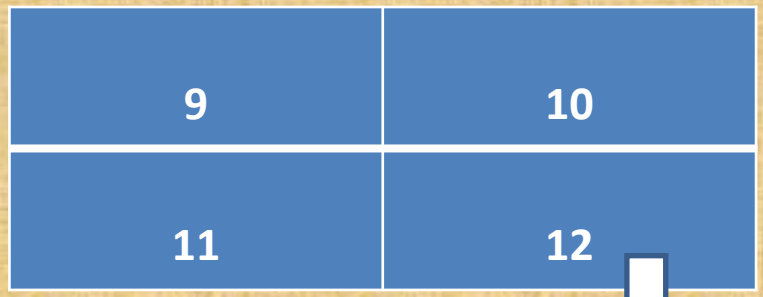
- Over the course of the study, Deep planted seedlings showed a greater increase in volume than Shallow planted seedlings.
- In September = 4 dead seedlings in Deep planted.
- In September = 9 dead seedlings in Shallow planted.

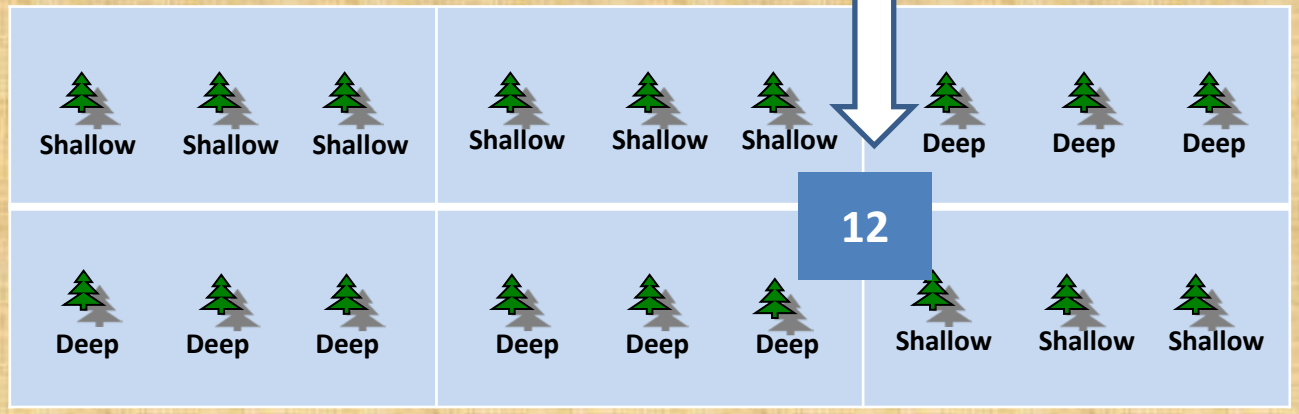

Eucalyptus Depth Study

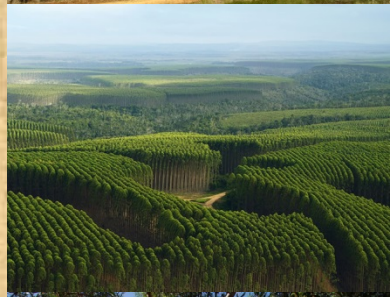
Stress Boxes

- There are 4 boxes (#9, #10, #11 and #12): Total = **72 seedlings**



- Inside each box, there are 6 plots:




Eucalyptus Depth Study

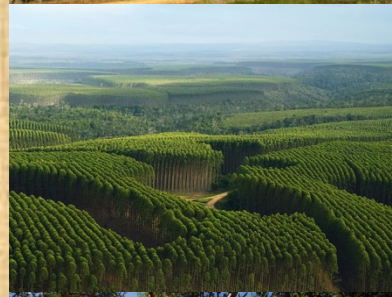
Stress Boxes

- Measured the height and diameters (ground line) of seedlings.

  1) Planting (5/1/2013);

  2) 3 months after planting (7/22/2013);

  3) 4 months after planting (9/17/2013);



Eucalyptus Depth Study

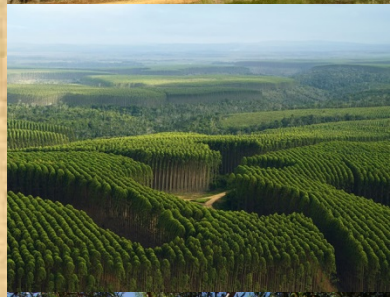
Results Stress Boxes

1. Average

	May			July			September		
	Ht (cm)	GLD (mm)	Vol (c	Ht (cm)	GLD (mm)	l (cc	Ht (cm)	GLD (mm)	Vo cc)
Shallow	48.2*	5.0*	9.9*	76.4*	7.5*	35.6*	75.2*	2.5	4.4
Deep	33.2*	3.2*	2.7*	66.7*	5.3*	14.8*	66.3*	2.5	3.9

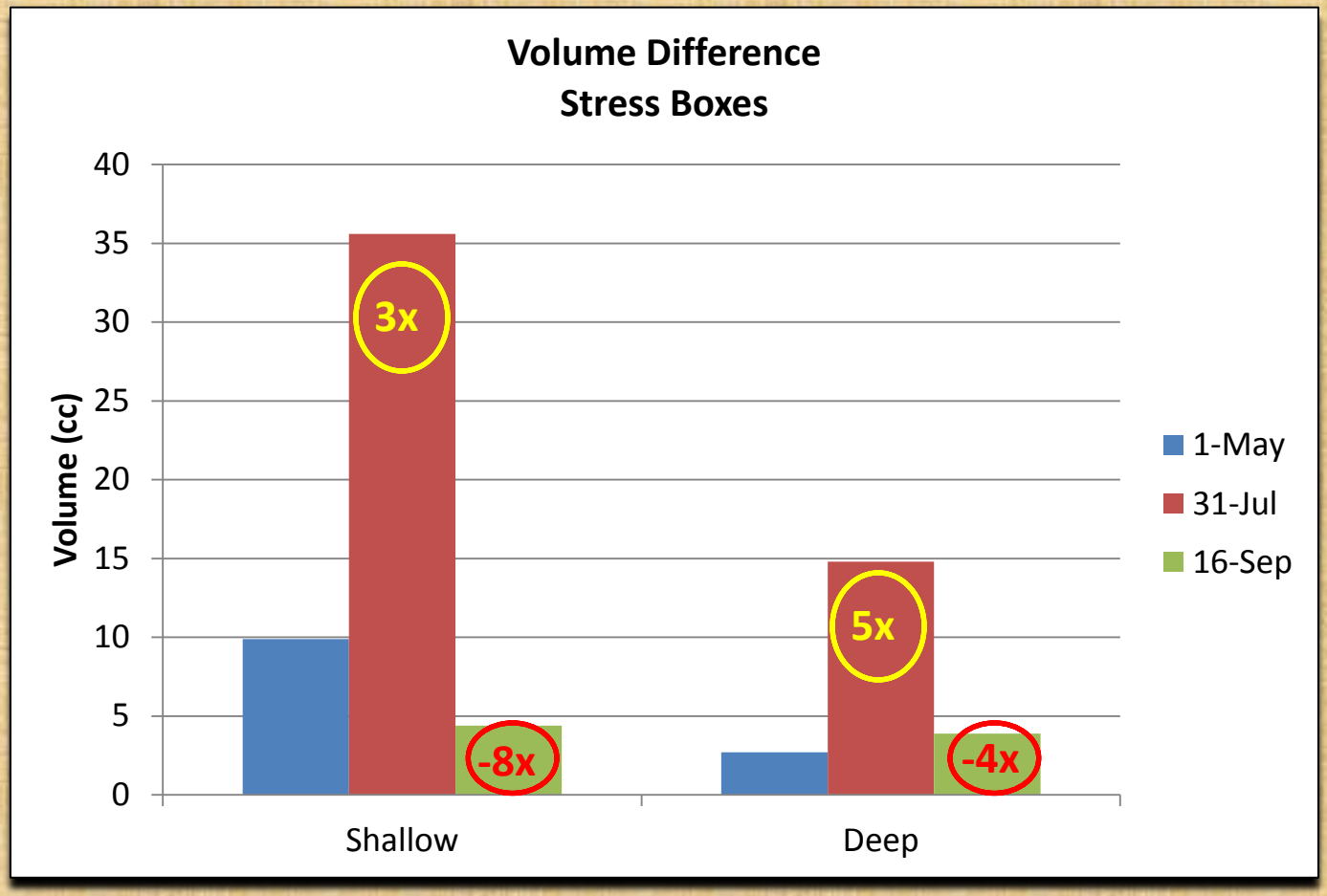
* Denotes significant difference

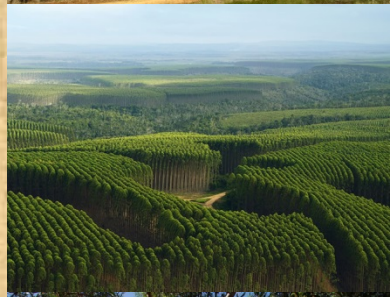
	DryWt (g)
Shallow	13.0*
Deep	10.9*


Eucalyptus Depth Study

Results Stress Boxes

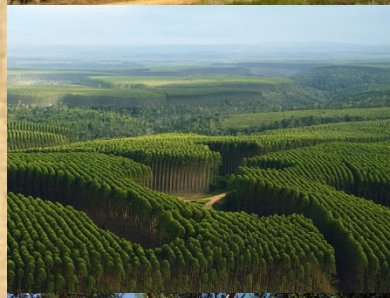




Eucalyptus Depth Study

Discussion Stress Boxes

- From May to July, Deep planted seedlings showed a greater increase in volume than Shallow planted seedlings.
- From July to September, due to lack of water (4 months), there was a greater loss in volume in Shallow planted than in Deep planted eucalyptus.
- In September = 51% dead seedlings in Deep planted.
- In September = 71% dead seedlings in Shallow planted.


Eucalyptus Depth Study

Discussion

- In Brazil, we believe that we can't plant eucalyptus seedlings deeply:

"The seedlings must be planted correctly, in other words, the seedlings lap must be planted at ground level (Picture 1). Seedlings planted deep may suffer siltation and may die because of "lap drowning".

(Wilcken, C. F. 2008)

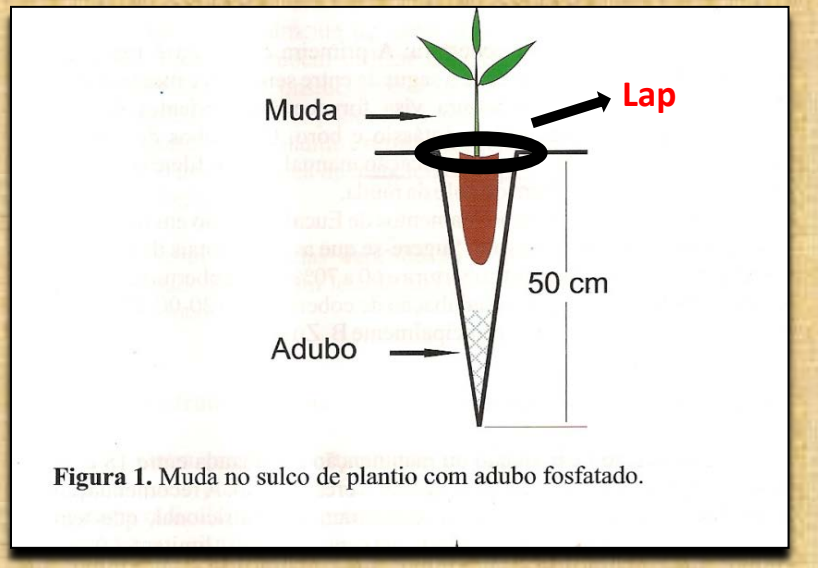
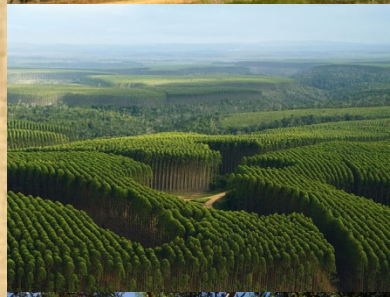


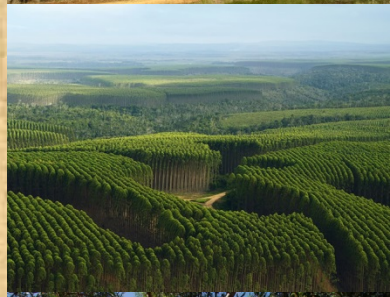
Figura 1. Muda no sulco de plantio com adubo fosfatado.


Eucalyptus Depth Study

Conclusion

- Our results are in sandy soil and *Eucalyptus benthamii*. What will be the results in different soil type and different species??



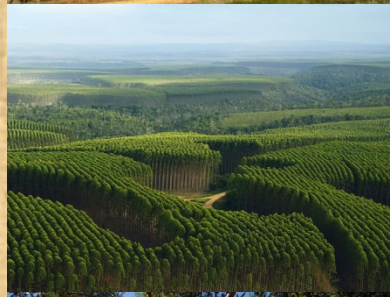
Eucalyptus Depth Study

Conclusion

- From May to September, the Trophatron experiment shows that eucalyptus planted Deep in sandy soil had a 5x greater increase in volume than eucalyptus planted Shallow.

- From May to July, the Stress Box experiment shows that eucalyptus planted Deep in sandy soil had a 1.5x greater increase in volume than eucalyptus planted Shallow.

- From July to September, the Stress Boxes experiment shows that there was a 2.1x greater loss in volume in Shallow planted than in Deep planted eucalyptus.

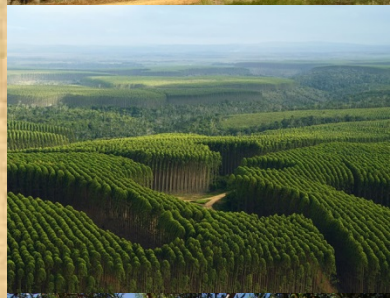




Eucalyptus Depth Study

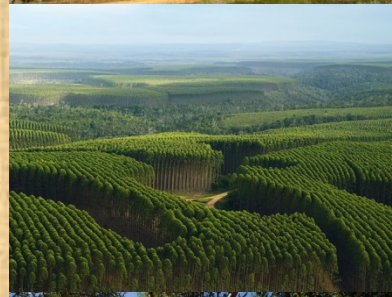
Conclusion

- Both experiments shows that the growth of eucalyptus planted deep in sandy soil was greater than shallow.

- We need to continue our evaluation with different soil type and species.


Eucalyptus Depth Study



Thank you very much!