



Forestry in Zhanjiang Prefecture

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Headlines

1. Basic introduction of Zhanjiang forestry and forestry industry
2. Eucalyptus plantation practice in Zhanjiang
3. Brief introduction of Leizhou Forestry Bureau



Total area: 12471 square kilometers

Population: 607.29 million



Zhanjiang, Guangdong

Typical picture of Zhanjiang

eucalyptus

sugarcane



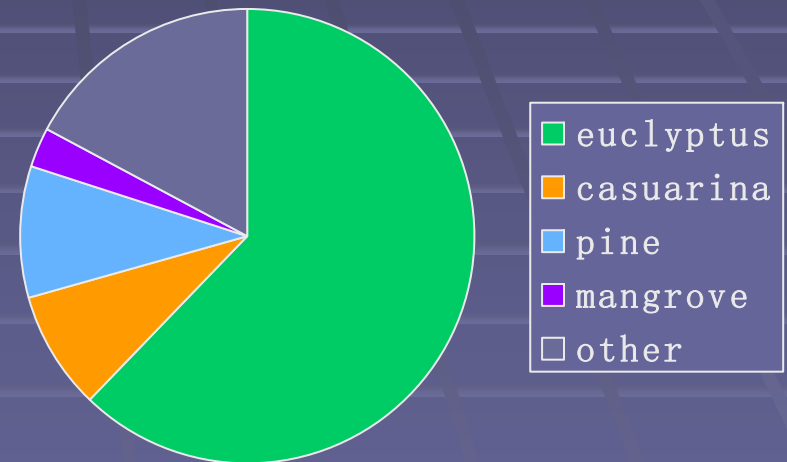
1. Basic introduction of Zhanjiang forestry and forestry industry

Geography and climate

- Geography position: 109°31'- 110°55' E, 20°12'- 21°35' N.
- Annual precipitation: 1417-1802mm
- Annual Average temperature: 22.8-23.5°C
- Annual sunshine hours: 1817.7-2106.0
- Accumulated temperature (>10°C): 8335.1°C
- Northern tropical or southern sub-tropical climate

Basic Data of Zhanjiang Forestry

- Area of forestry land: 304,716 ha
- Forest coverage: 23.4%
- Area of eucalyptus: 169,611.1 ha
- Area of casuarina: 22,188 ha
- Area of pine: 25,848.5 ha
- Area of mangrove: 7,716 ha
- Area of other trees: 46,919 ha



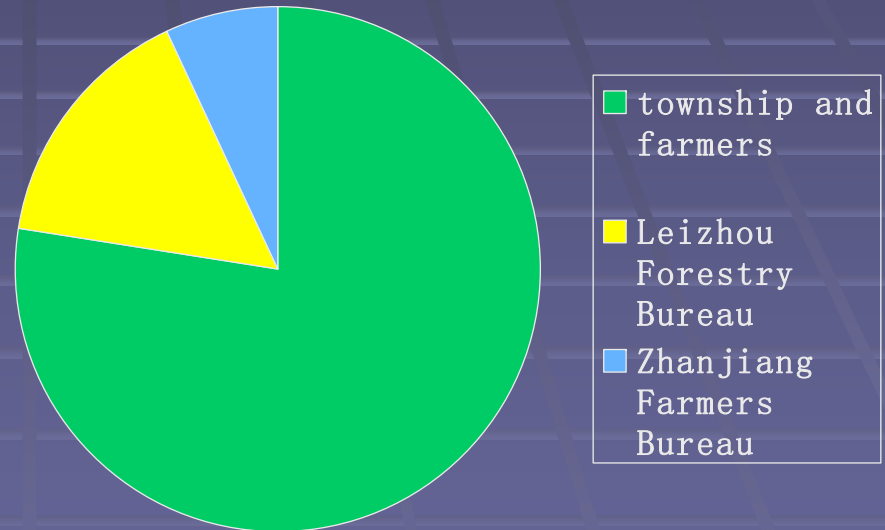
Mangrove forest



Basic Data of Zhanjiang Forestry

Ownership

- Collectives and farmers: 236,013 ha
- Leizhou Forestry Bureau: 47,187 ha
- Zhanjiang Farms Bureau: 21,515 ha

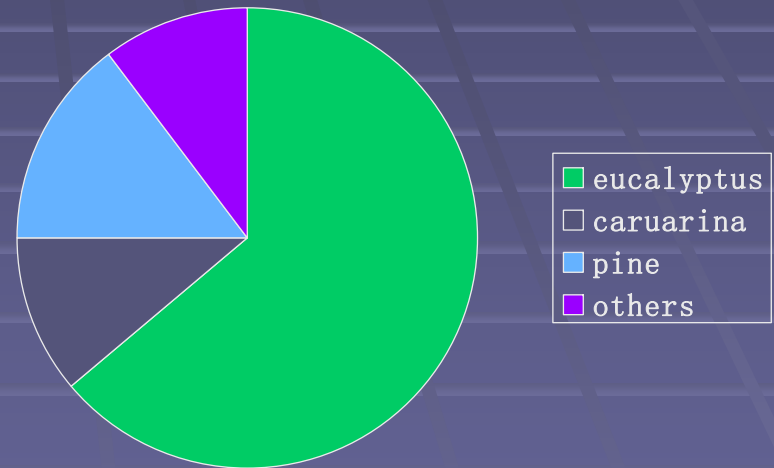


Standing volume

- Total standing volume:
11,657,545 m³

Standing volume of

- eucalyptus: 6,923,719 m³
- casuarina; 1,193,866 m³
- Pine: 1,607,674 m³
- Others: 1,110,933 m³



Important seedling production base

- 300 nurseries, 10 have a production of 10,000 cuttings per year
- Total production: 380,000,000 cuttings of eucalyptus per year selling to Guangdong, Guangxi, Hainan.

Farmer's nursery





Forestry Administration

- 1 prefecture level forestry bureau
- 8 county level forestry bureau
- 73 forest station (township)
- 6 forest police sub-bureau
- 4 forestry police station
- Total staff: 1200

Key Institutions of Forestry

- China Eucalypt Research Centre / South China Experiment Nursery, CAF
- Forestry Department, Guangdong Ocean University
- The Forestry Institute of Leizhou Forestry Bureau
- Zhanjiang Mangrove Reservation Bureau
- Zhanjiang Forestry Institute

Exportation of woodchips (eucalyptus)

year	Volume (ADT)	year	Volume (ADT)
1991	186,000	1998	352,000
1992	121,000	1999	380,000
1993	302,000	2000	405,000
1994	426,000	2001	385,000
1995	527,000	2002	507,000
1996	410,000	2003	447,000
1997	503,000	2004	478,000

Wood processing enterprises

- Woodchips mills: 26
- MDF mills: 3
- Veneer mills: 52
- Other small processing mills: 474
- Volume consumed in processing: 603,652 m³
 - Eucalyptus wood: 550,686 m³
 - Pine wood: 6,643 m³
 - Other wood: 4,233 m³



26 woodchips mills





52 veneer mills





3 MDF mills



Other small mills: 474

2. Eucalyptus plantation practice in Zhanjiang



Old eucalyptus plantation with poor species & no tending



E.urophylla clone (U6) plantation of 3 yrs at Zhanjiang

2.1 Eucalyptus Cultivation

- ☆ Site preparation: Tractor plough in flat areas, hole cultivate on steep slopes.
- ☆ Density: 1.5m×3.0m / 2.0m×3.0m (plain area), 2.0×2.5m (mountain)
- ☆ Base fertilizer: Compound fertilizer 250g + phosphates 250g per tree
- ☆ Additional fertilizer: Nitrogen fertilizer 100g + compound fertilizer 150g per tree from 1st yr to 3rd yr
- ☆ Tending: Clean up weeds and bushes in first 2 yrs



Site preparation
at plain area



The image is a composite of two photographs. The top photograph shows a wide view of a mountain slope with numerous horizontal terraces, appearing to be prepared for agriculture. The bottom photograph shows a person in a grey jacket and dark pants working on a steep, eroded hillside, possibly planting or clearing land. A green oval with white text is overlaid on the center of the image.

Site preparation
at mountain area

Base fertilizer



Additional fertilizer



Tending







2005/06/13

Yong plantation of *E.urophylla* clone in plain area



Farmers' forest, high density



1 X 2 m, 4995/ha



1 X 1.5 m, 6660/ha

2.2 Seedlings and cuttings propagation

Tissue culture—step by step

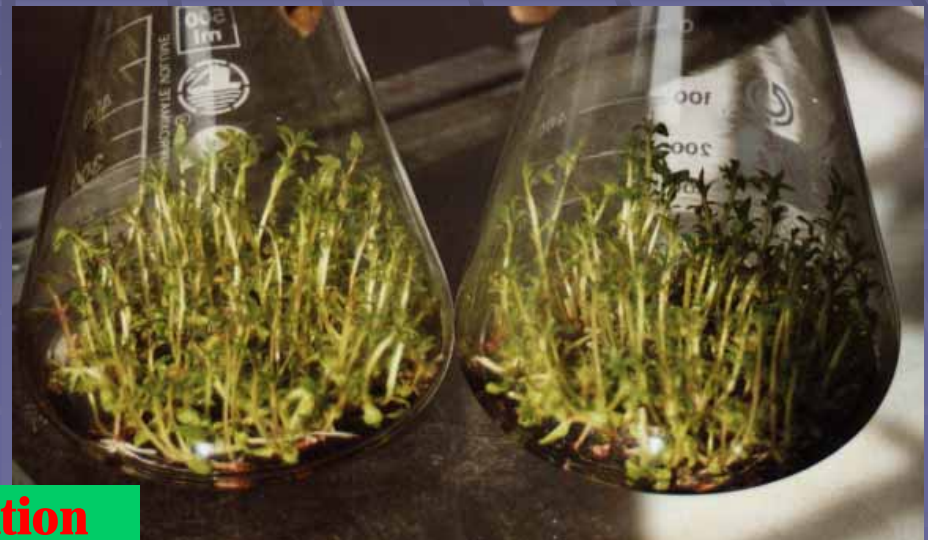




Initiation phase



Proliferation



Tissue culture—step by step



Plantlets transferring from bottles to open air soil pots

Traditional method of seedling production



Cuttings collection



Cuttings ready for inserting



New inserting cuttings



Cutting ready for planting

Traditional method of seedling production



Watering



Root curling problem

South China Experiment Nursery (SCEN)



Eucalyptus cuttings propagation in greenhouse



Seedling production using modern machinery



Production line



Tray separation machine



Tray cleaning machine



Medium filling machine

Seedling production using modern machinery



Cuttings inserting to trays



Transportation in SCAN



Cuttings in shading house



ready made cuttings



New tray with light medium, straight roots cutting

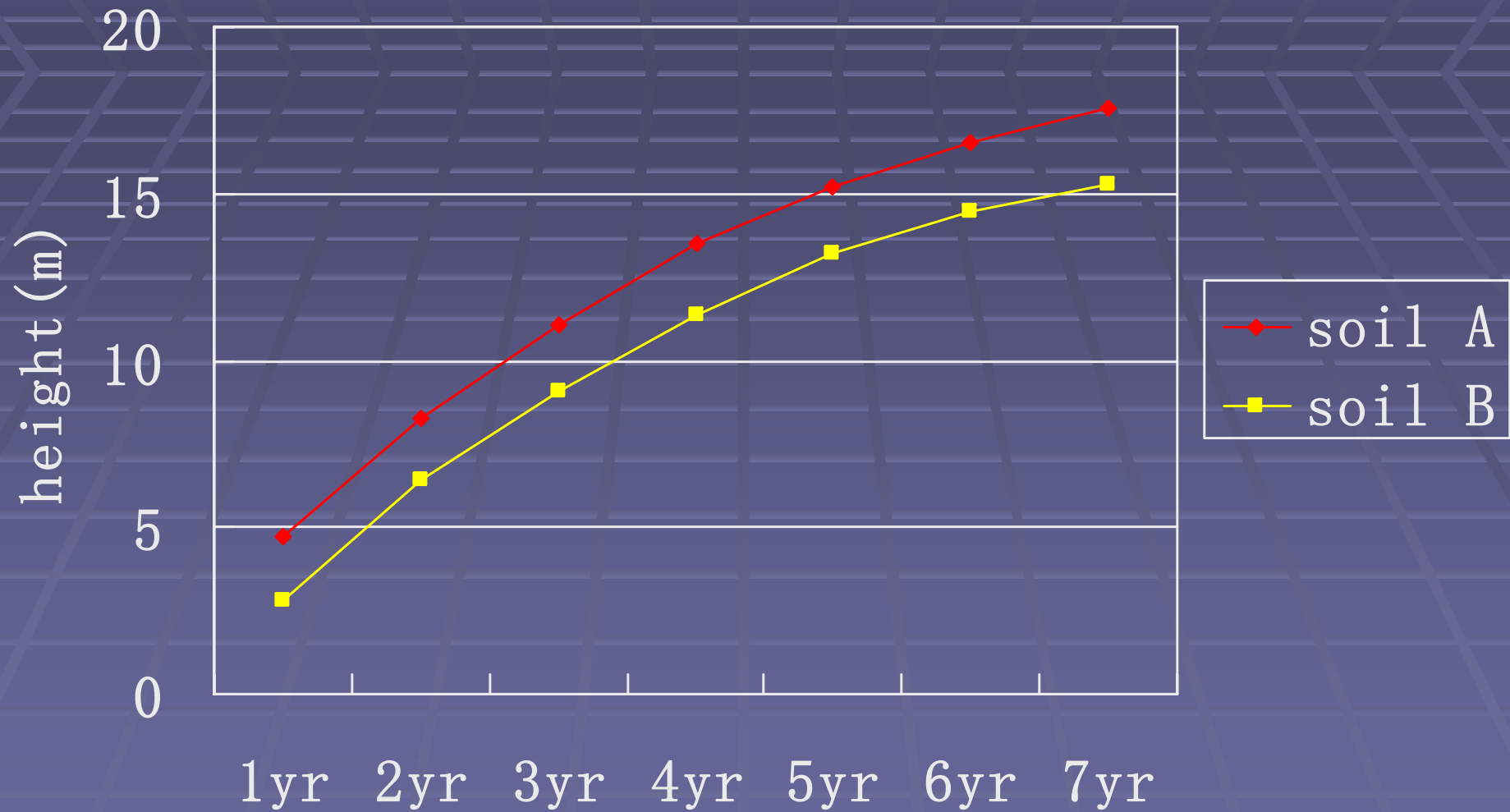


Plastic bag with soil medium, curling roots

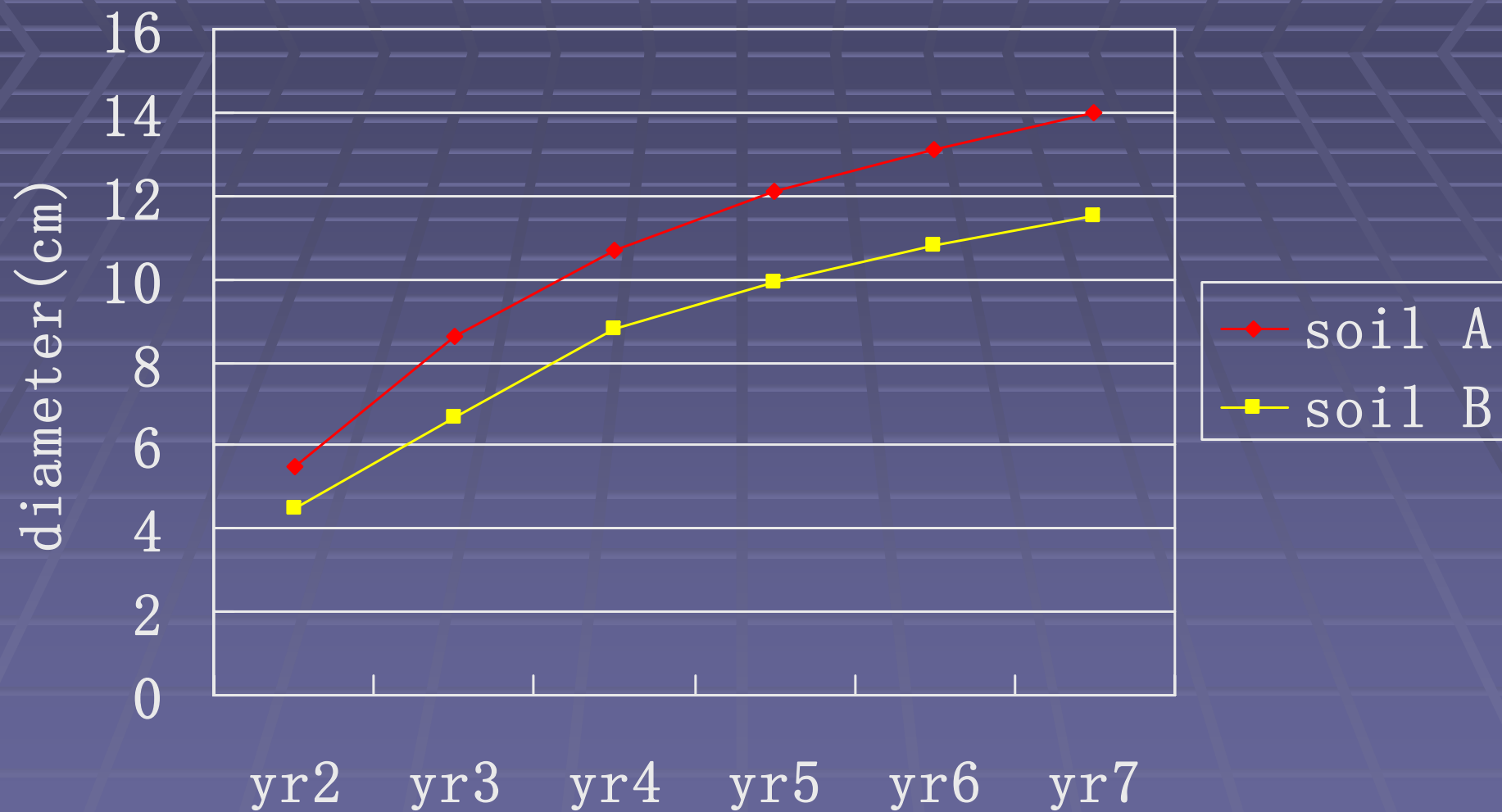
2.3 Growth

- at Leizhou Forestry Bureau in Zhanjiang, the average MAI of plantation (35,000 ha) is about $22\text{m}^3/\text{ha}/\text{yr}$.
- MAI of the best plantation in Zhanjiang is $45\text{m}^3/\text{ha}/\text{yr}$.

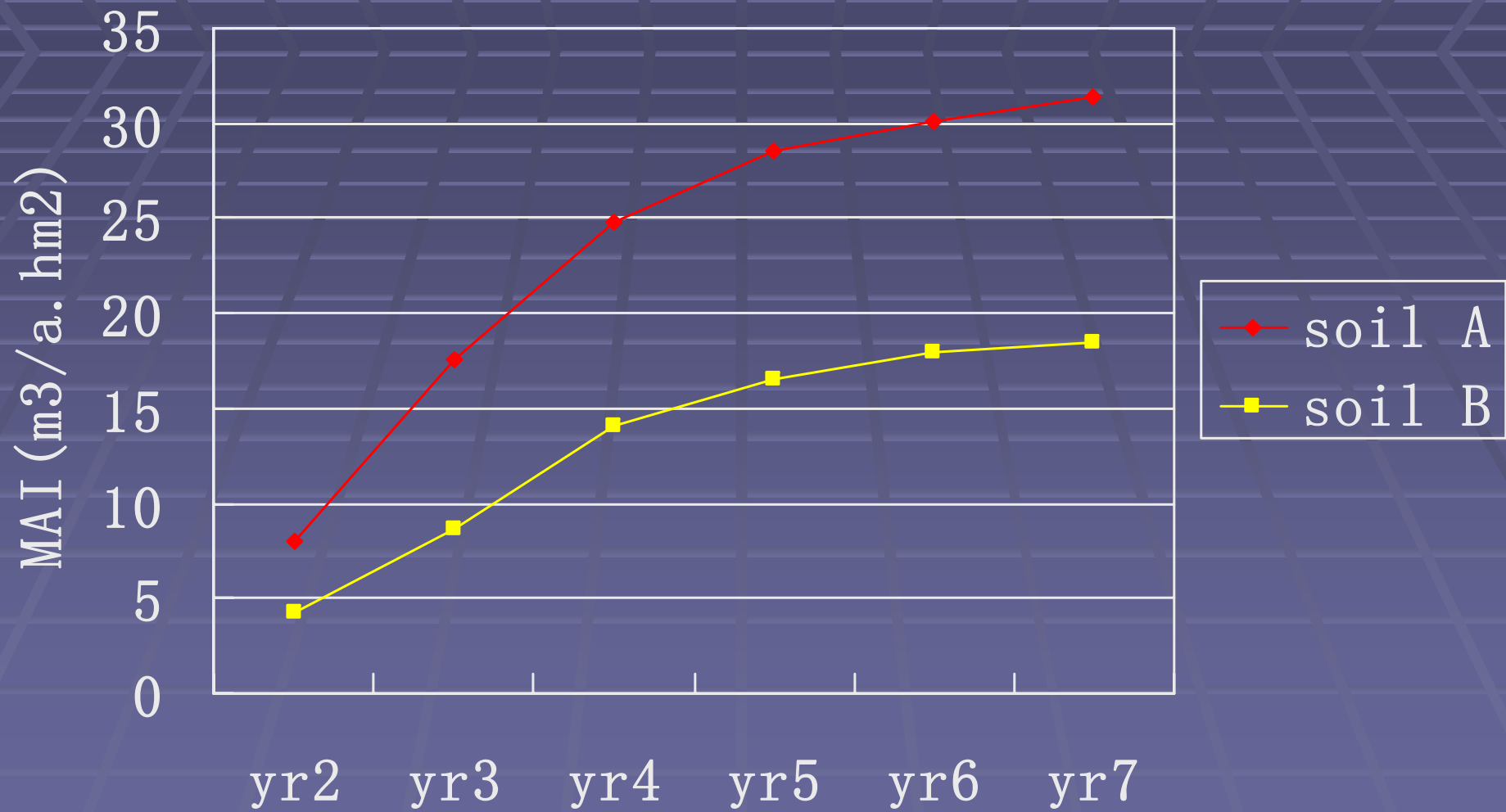
Height curve



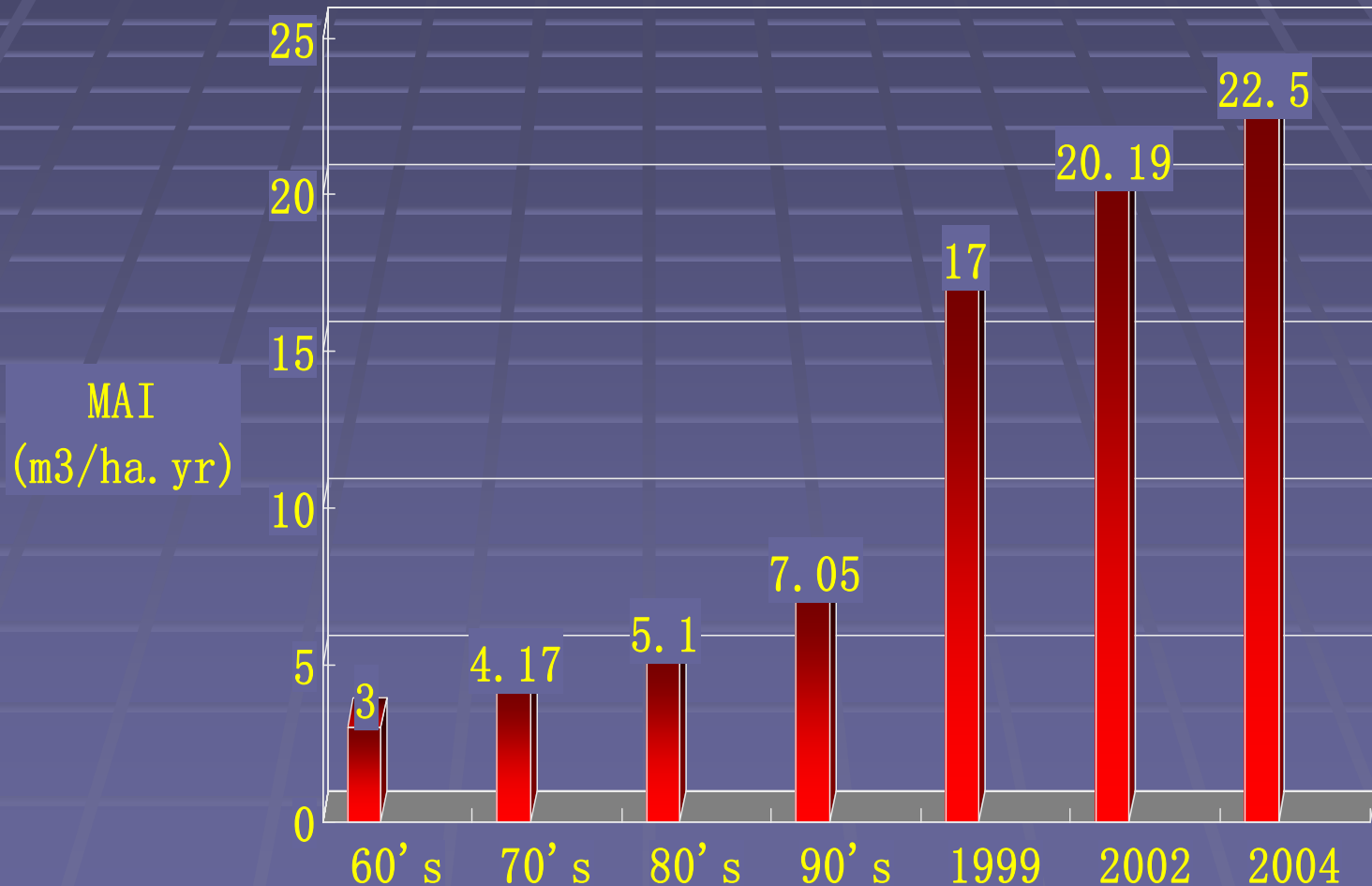
Diameter curve



MAI curve



MAI increasing from 1960,s to 2004 at Leizhou Forestry Bureau (from Mo Xiaoyong)





E. Urophylla clone in Zhanjiang (MAI=38 m³ / ha·yr)



ABL12(W5) in Zhanjiang ($\text{MAI}=35 \text{ m}^3 / \text{ha}\cdot\text{yr}$)



10-month-old coppice of first generation (7m)

2.4 Manual harvesting







2.4 Economic benefit analysis of eucalyptus plantation

Cost & income calculation (according to woodchips price in 2004)

items		Amount & price	Money
Rotation period		5 years	
Standing volume		10 m ³ / mu	
Wood production		7.5 m ³ / mu	
Fresh weight of wood		9 ton、300 yuan / ton	2700 yuan / mu
Cost	Establishment cost	Site preparation, fertilization, seedling	350 yuan / mu
	Harvesting cost	70 yuan / m ³	525 yuan / mu
	Land rent fee	30 yuan / mu. yr	150 yuan / mu
	Interest of invest	3% of establishment cost	52.5 yuan / mu
	Sub-total		1077.5 yuan / mu
Tax and fee	Forest fee	10% of sales income	270 yuan / mu
	Increment tax	cancelled	
	Native tax	cancelled	
	Protection fee	5 yuan / m ³	37.5 yuan / mu
	Quarantine fee	0.5% of sales income	13.5 yuan / mu
	Sub-total		321 yuan / mu
Total income			2700 yuan / mu
Total cost			1398.5 yuan / mu
Total benefit			1301.5 yuan / mu
Annual benefit			260.3 yuan / mu-year

3. Leizhou Forestry Bureau

- Established since 1954, state ownership
- Consist of 9 forest farms, 1 institute, 1 MDF mill and 1 company.
- Total staff: 2800, including 480 scientific staff
- Total area: 50,000 ha, forestry land: 42,000 ha
- 90% of forestry land are: eucalyptus plantation
- It is called: “kingdom of eucalyptus in China”
- Total standing volume: 1,910,000 m³, annual increment volume: 611,00 m³



Thank you! 谢谢!

2004年资源清查数据表明，雷州林业局桉树人工林面积已达3.0万hm²，总蓄积量192万m³，年总生长量61万m³。桉树无性系速生丰产林年平均生长量达到22.5 m³/hm².a。

桉树营林技术整体水平已达到国内领先地位。