丛植混交林造林法

—适应气候变化及复杂山地条件下的珍贵树种培育新技术

CLUMP PLANTING FOR MIXED PLANTATION

— A NEW DESIGN FOR CULTIVATION OF VALUABLE WOOD ADAPTATIVE TO CHANGEABLE CLIMATE AND COMPLEX MOUNTAIN SITES

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2010.11.23 广西南宁

背景Background

Problem 1:

适地适树问题

How to match tree species with site

Problem 2:

良种问题

Lack of improved variety

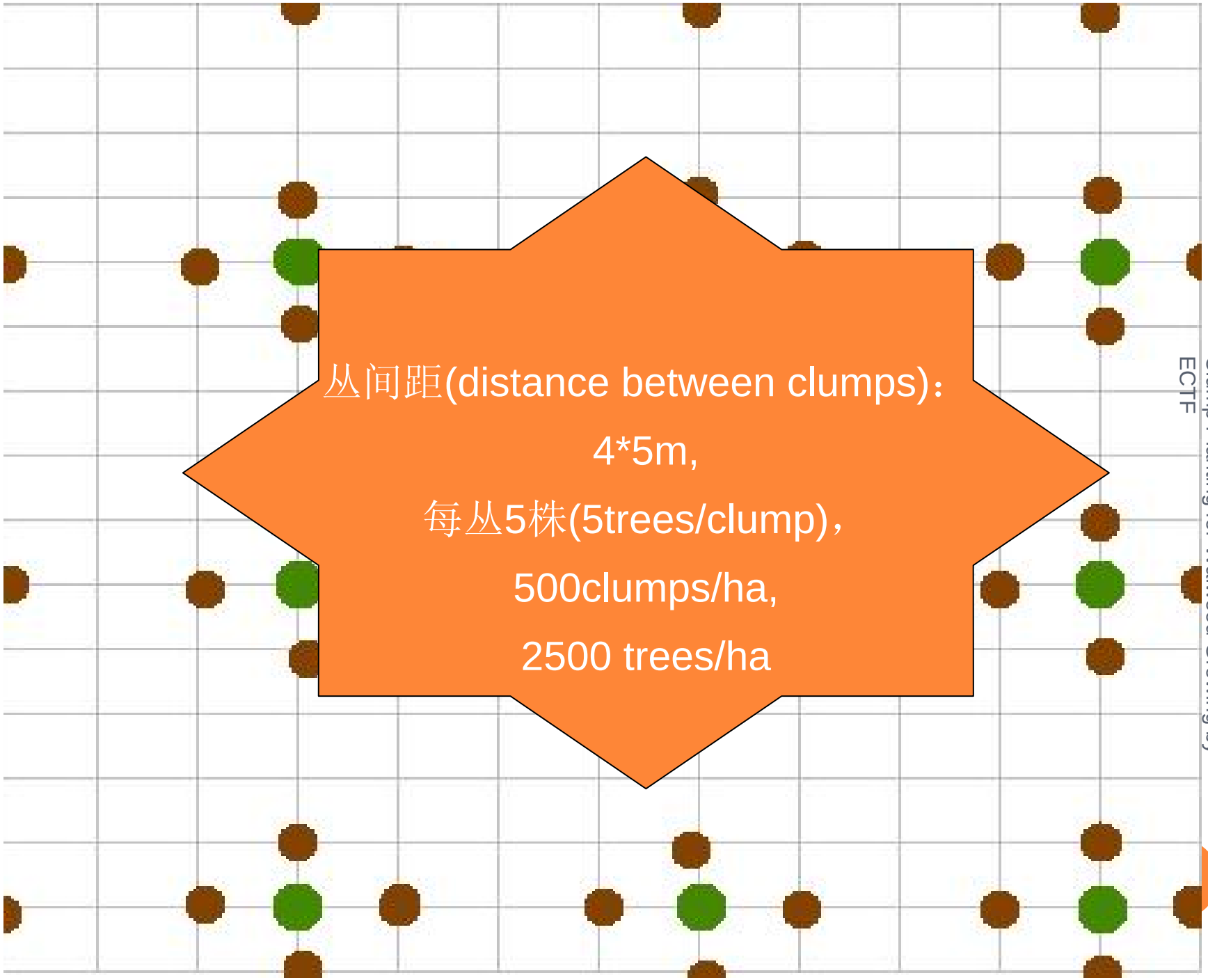
Problem 3:

适用的高效培育模式少

Lack of proper and effective cultivation modes.

寻找一种合适山地种造林的栽培模式，是当务之急！

Some proper cultivation modes for walwood is most important thing to do, now!


丛间距(distance between clumps)：
4*5m,
每丛5株(5trees/clump)，
500clumps/ha,
2500 trees/ha

PART 1

设计指导思想

The General Idea for the Design of Clump Planting

设计指导思想 General Design Idea for Clump Planting

技术目标 THE GOAL

- 以培育高价值大径材目标树为核心技术目标
- **aiming to develop technique on cultivation of high valuable wood with large diameter.**

技术途径 THE APPROACH

- 参考一般树种纯林丛植技术经验与德国同事的珍贵树种农林复合经营设计
- **By learning the design idea from agro-forestry system which the Germany experts have done for walwood , and from some experiences of clump planting of other timber species in China.**

设计效果 THE PURPOSE

- 设计高效、实用、低风险，适合山地连片大面积营造大径材用材林的造林模式。
- **Aiming to design some modes which are high efficient, more practical and with low risk for growing valwood in a large area of mountain sites.**

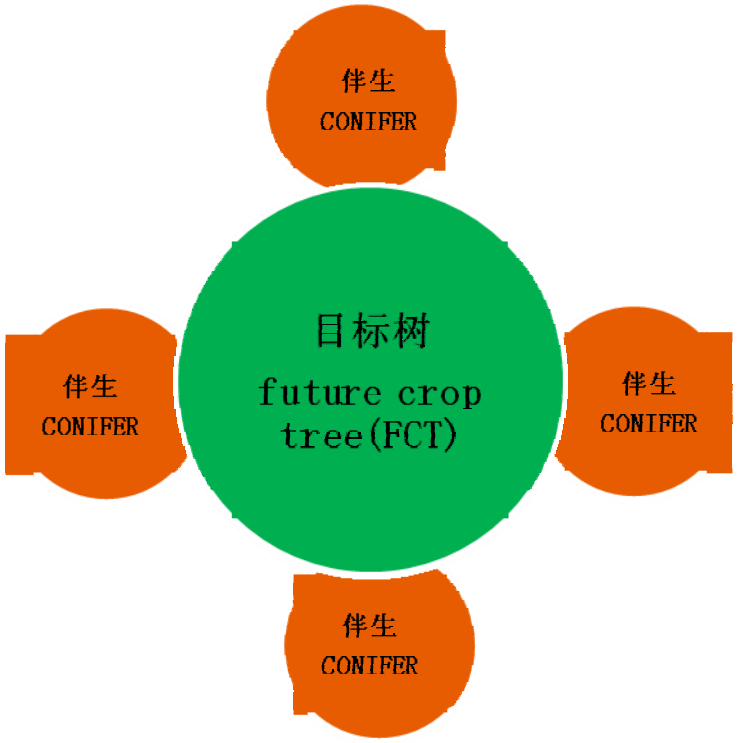
PART 2

丛植混交林的3种模式设计

A Design of 3 Models for Mixed Plantation By Clump Planting

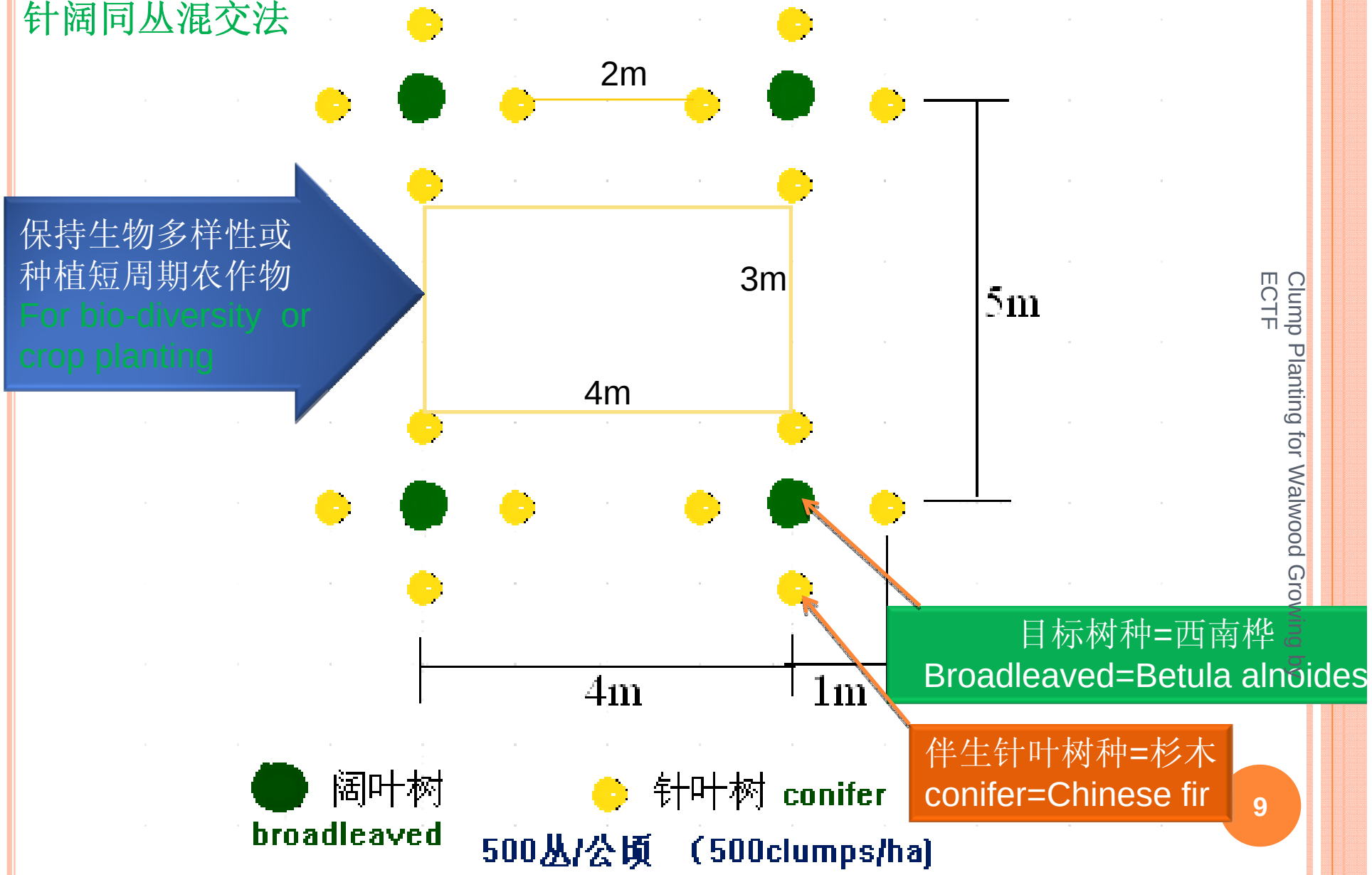
1、针阔同丛混交方式

Model 1： Conifers and Broad-leaved Mixed within a Clump



1 丛=1株目标树+N株针叶伴生树 **1clump for1 FCT+ N conifers**

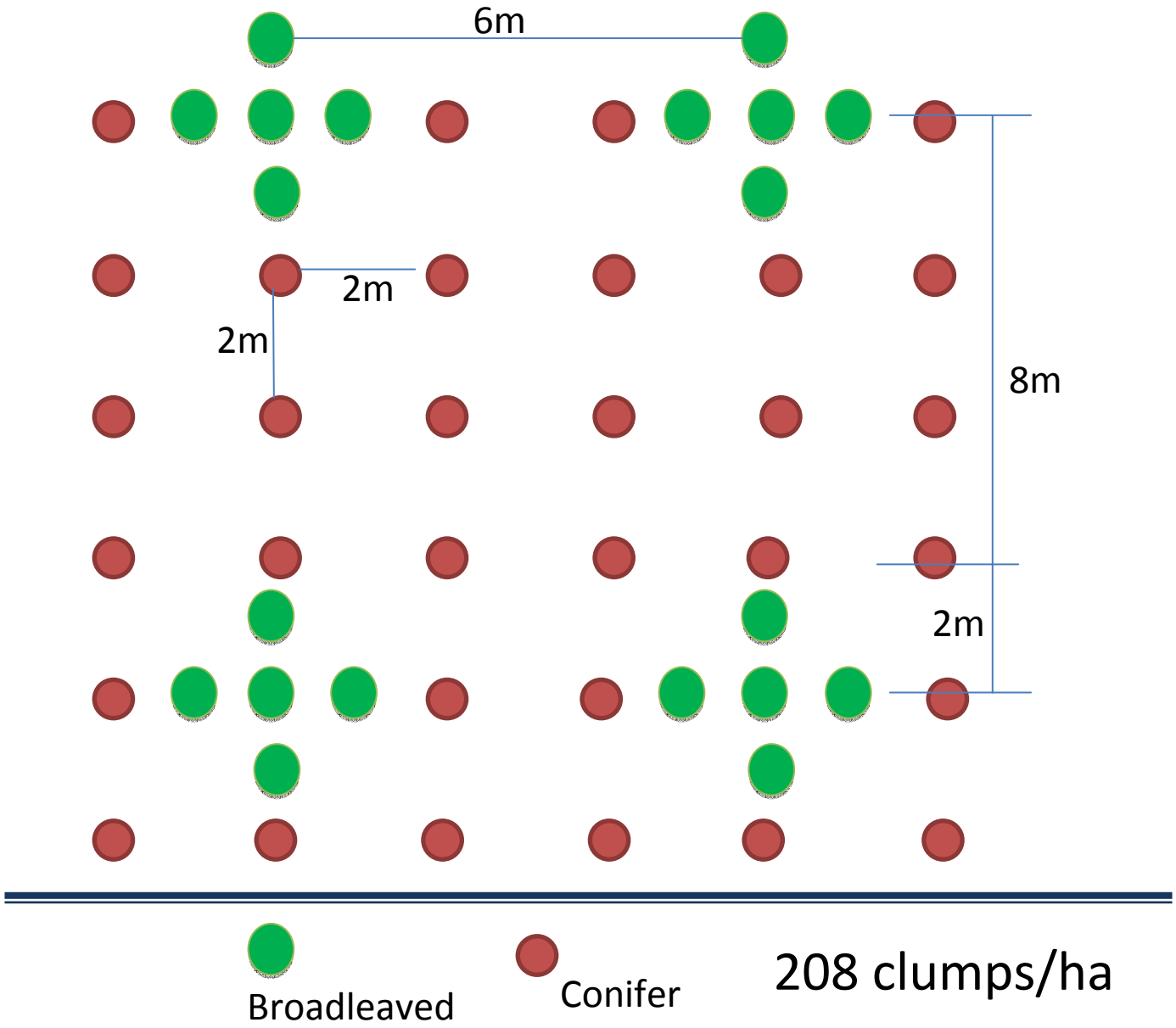
Model 1
针阔同丛混交法



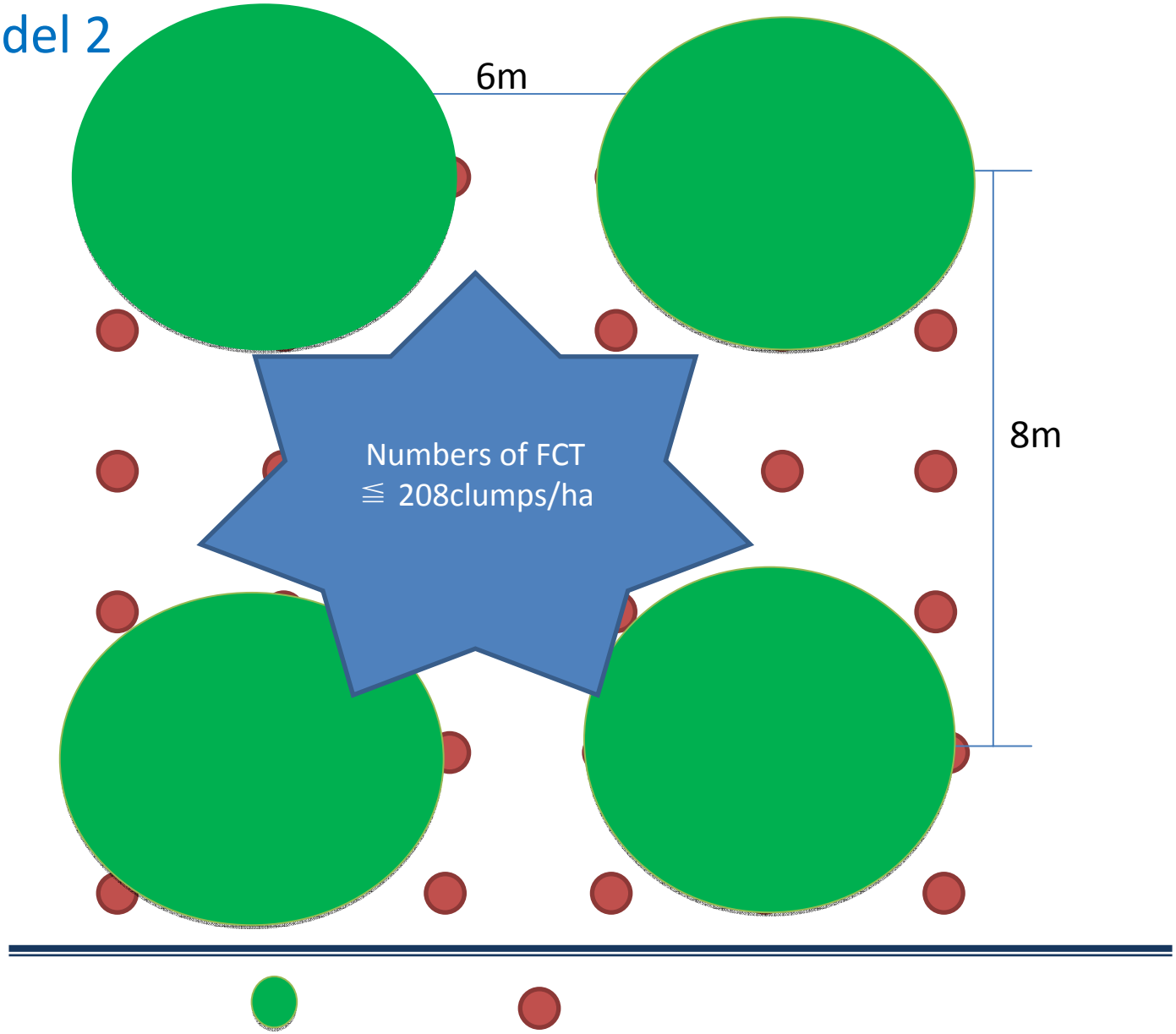
2、阔丛针单混交方式

Model 2： Broad-leaved in clump mixed conifer in single

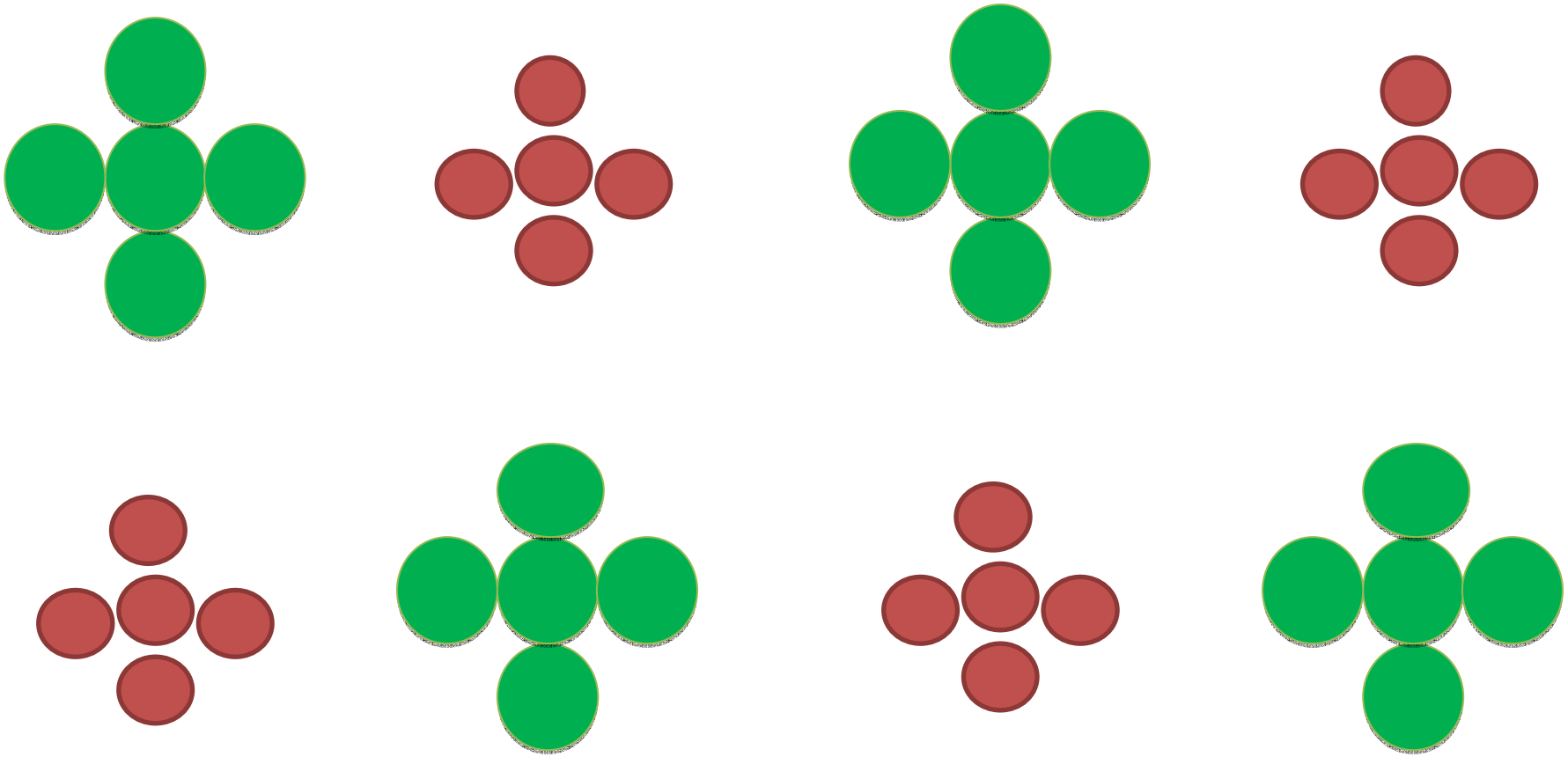
Model 2



Model 2

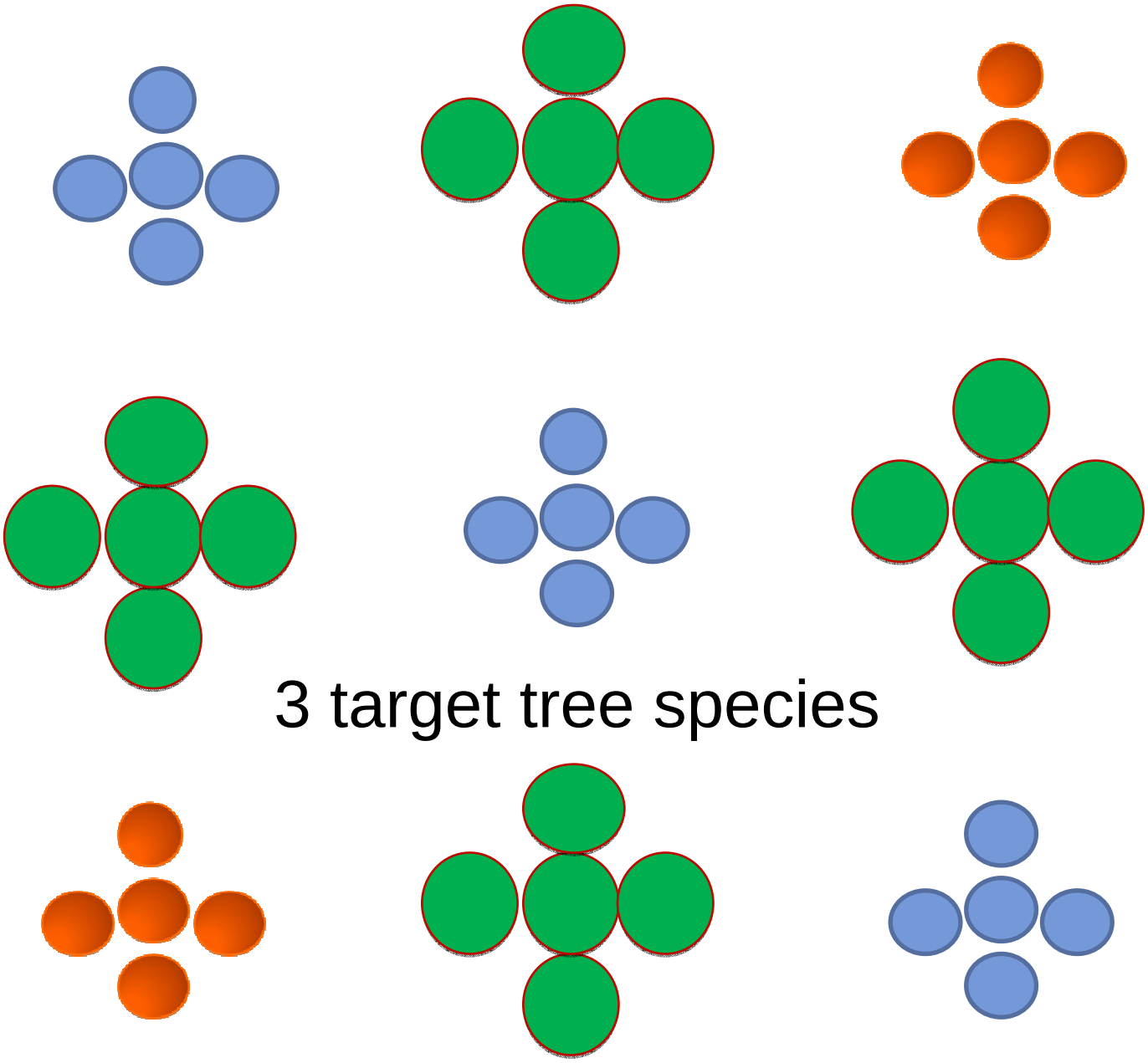


3、阔叶异丛混交方式

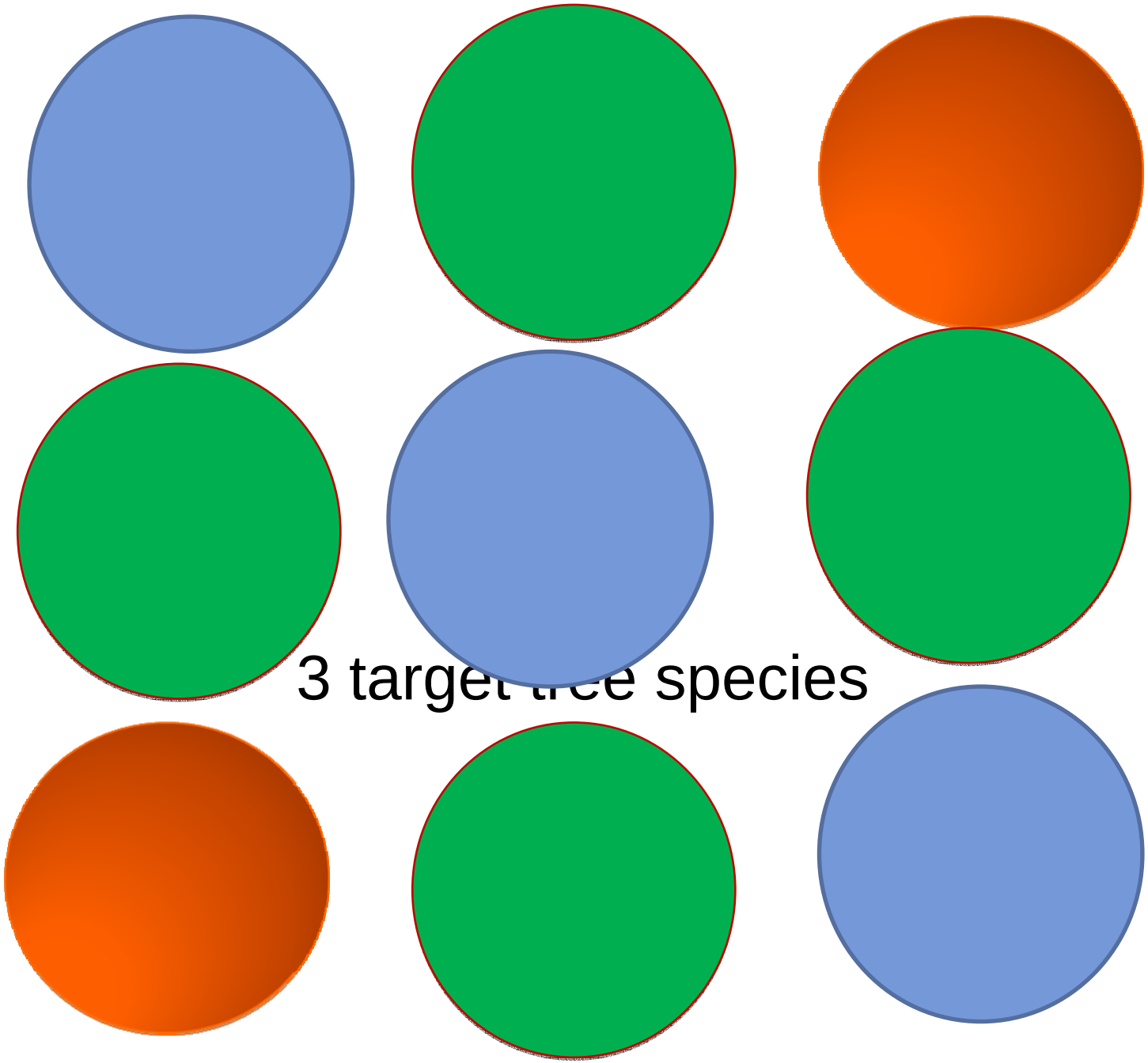


2 target tree species

Mixed Plantation with Clumps of Two or More Different Broad-leaved Tree Species



3 target tree species


3 target tree species

目标树种多样，景观多样性丰富的森林！

丛株数及丛密度的确定
HOW MANY TREES &LUMPS PER HECTARE

Depend on

- **S**ite condition(productive potential)(good for less)
- **G**enetic variation of tree species (vast for more)
- **T**arget diameter of FCT (big for less)
- **P**rice of small or medium diameter of wood（for pulp and paper, bio-energy ect.) (good for more)

PART 3

珍贵树种丛植混交林设计的特 点

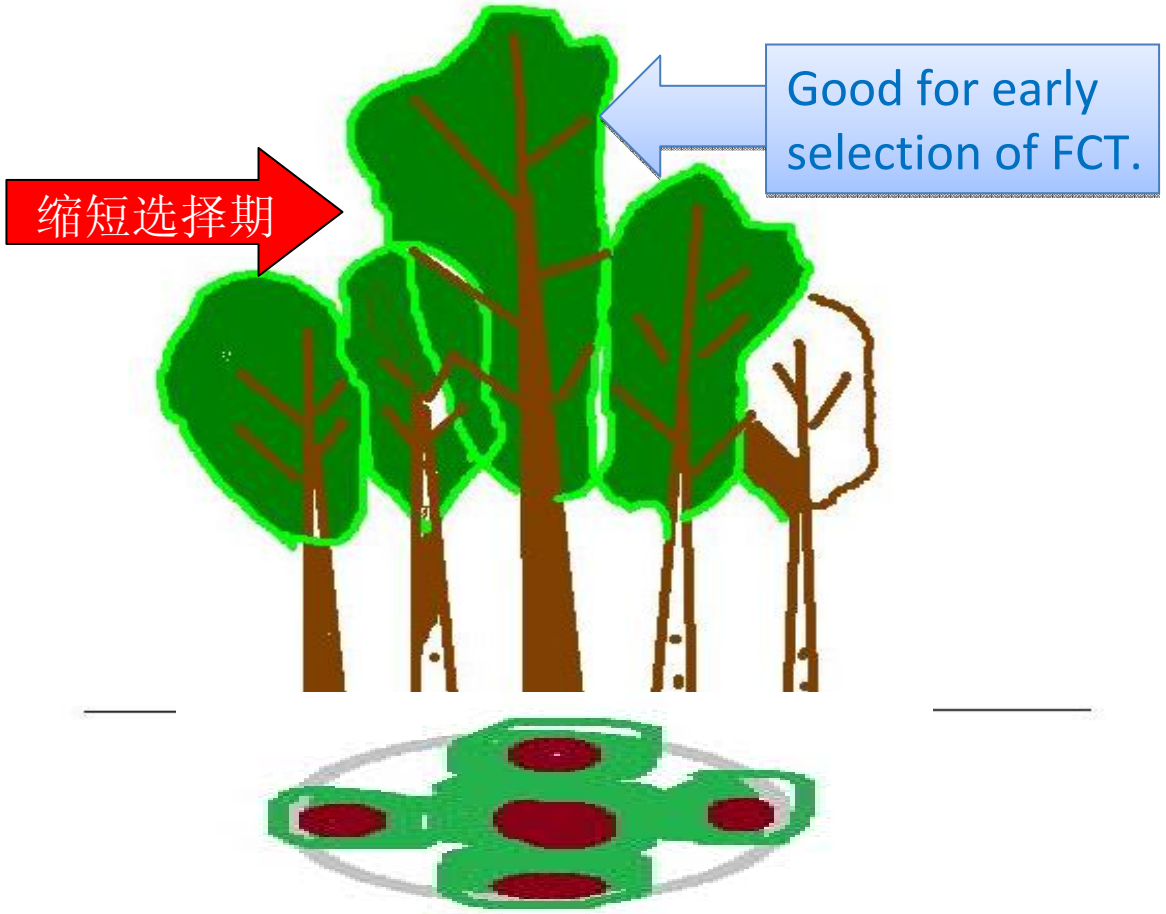
WHAT'S NEW & ADVANTAGES OF THE CLUMP PLANTING FOR MIXED PLANTATION

1 符合目标树定向（大径材）培育的技术路线

It's quiet a proper approach for oriental cultivation of valuable wood with large diameter

■丛植有利物种早期互利关系的发生，提前进行目标树选择；

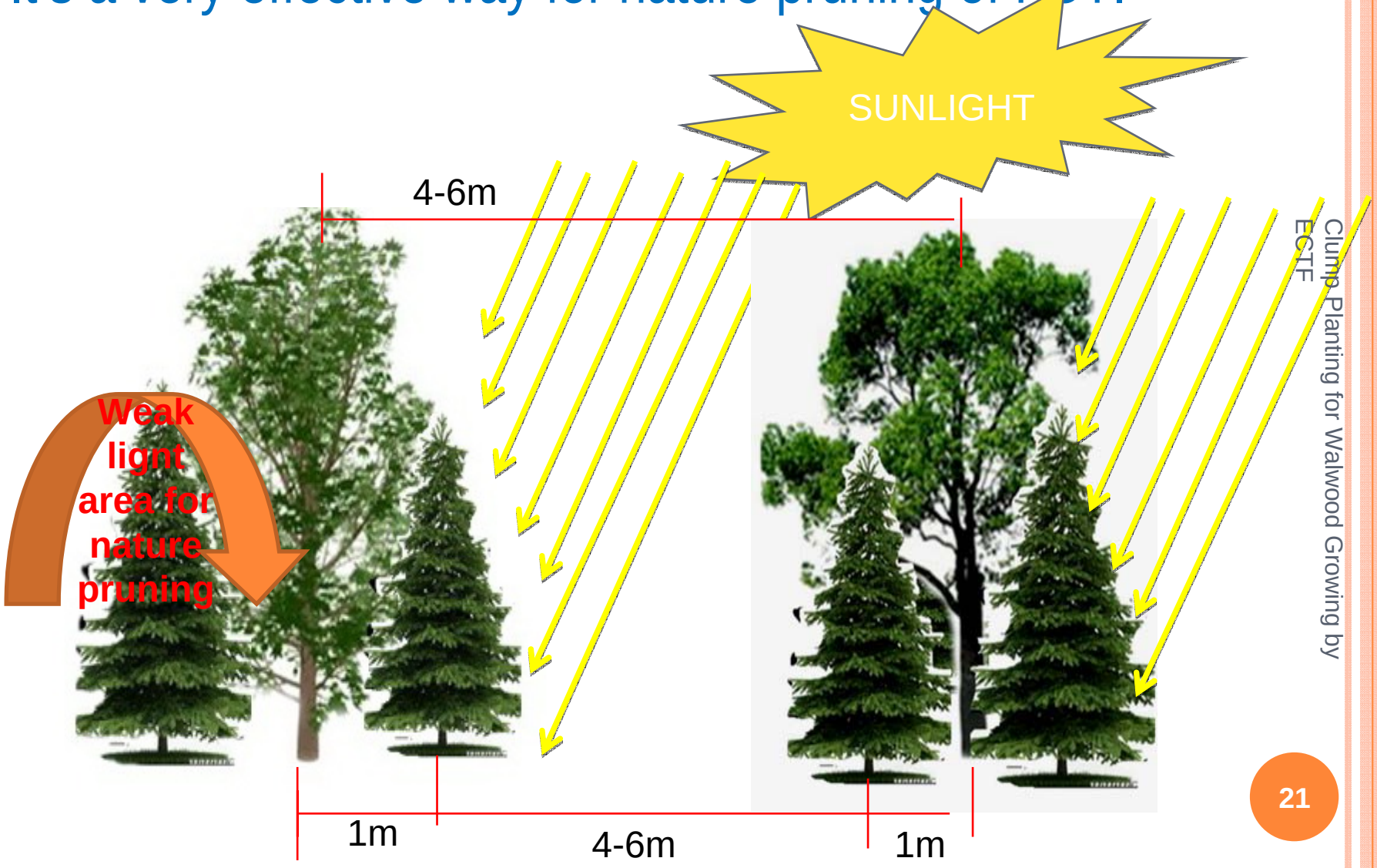
It could be helpful for the early selection of FCT, because the competition of trees in clumps would be happen early any way.



选择遗传品质高的为目标树

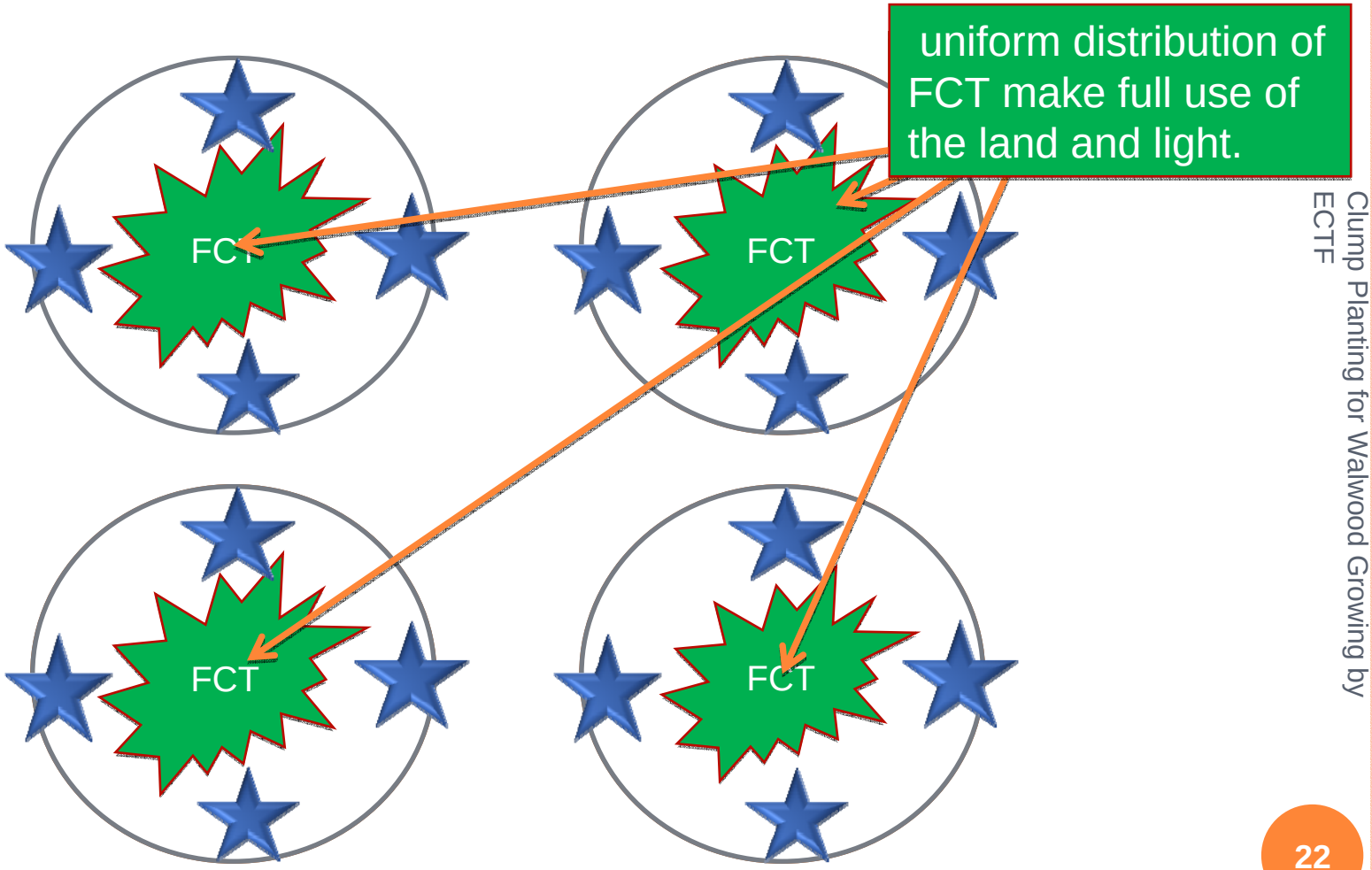
■对目标树优良干形培育有利

It's a very effective way for nature pruning of FCT.



■有利目标树生长，可缩短成材周期。

Good for growth of FCT, and could shorten the rotation for Walwood.

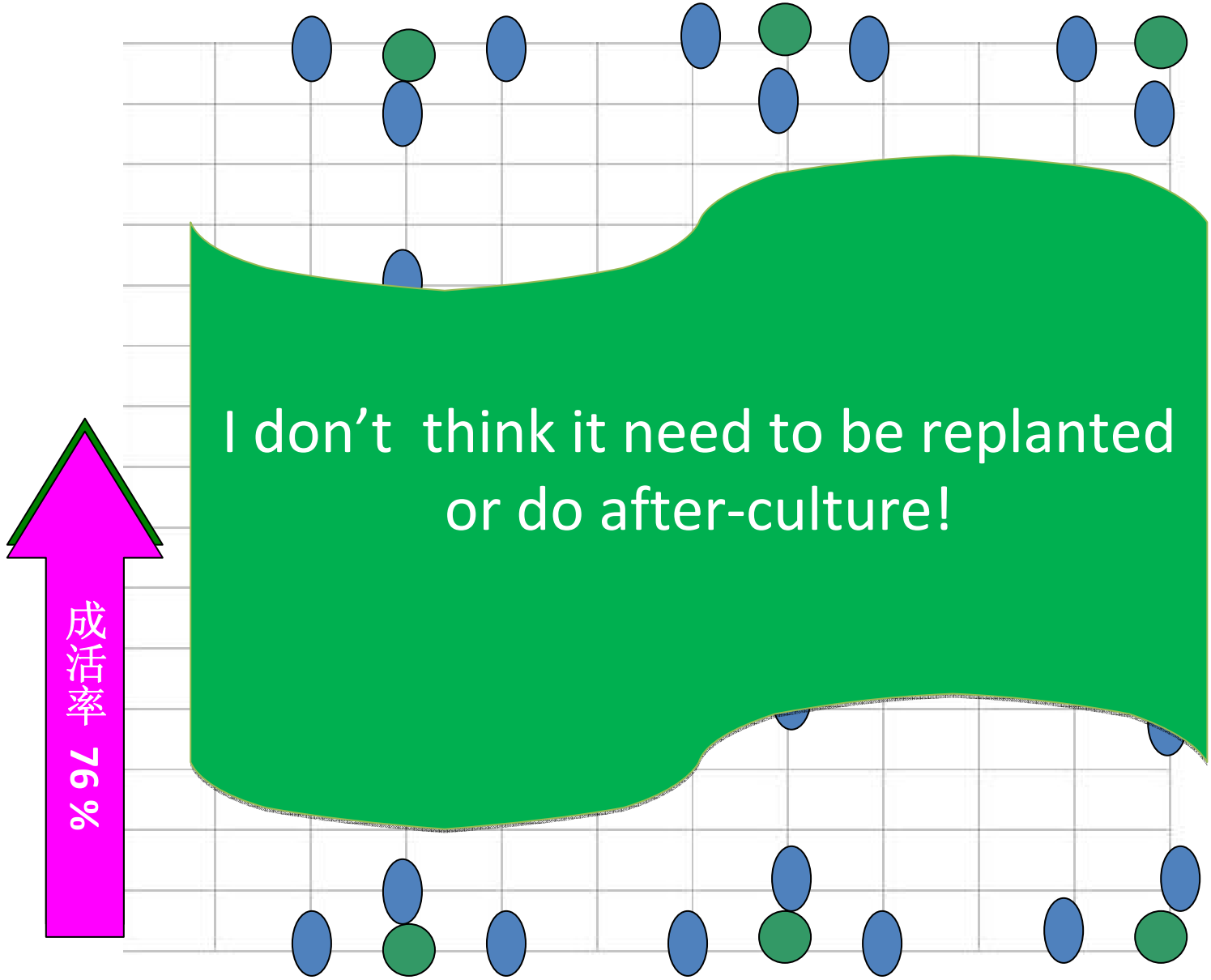


2 低成本育林

Vast adaptative to climate change and low cost for cultivation of walwood.

- 减少气候和种植技术等因素对成林质量的影响

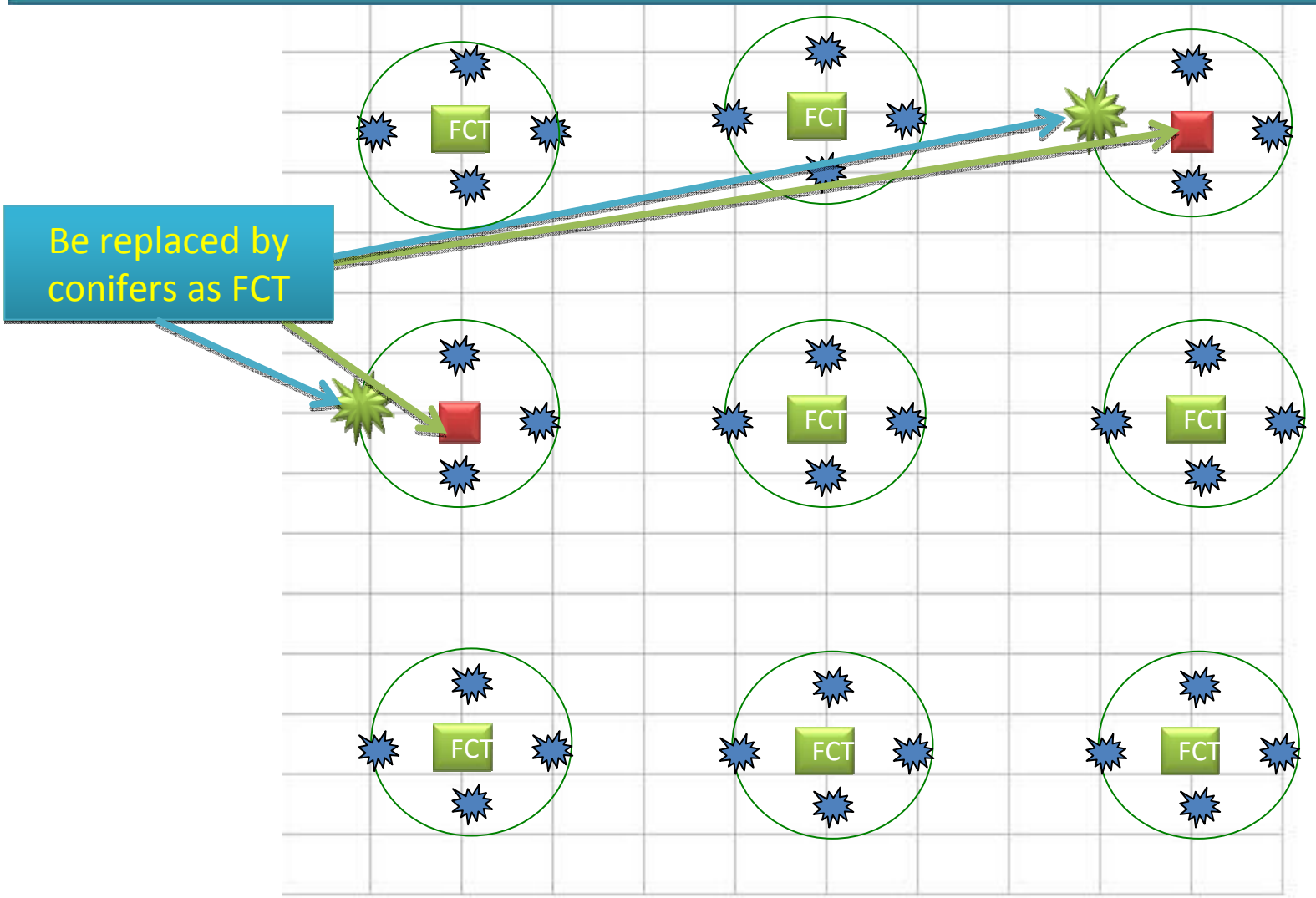
No requirement of costly replanting for lower survive rate caused by planting in bad weather or poor tending of young trees.


I don’t think it need to be replanted or do after-culture!
成活率 76 %

- 避免因个别目标树种生长不良，出现低产林分

It could prevent low productive plantation happening even there are some bad performance of broadleaved trees.

生长欠佳的目标树种树木将被伴生树替代为补充目标树
Bad performance Walwood trees would be replaced by the accompanying conifers



3 经营混交林技术简便

It’s quiet an easy way for the management of mixed plantations

采取从内间伐，混交树种间调节，技术操作简便，便于推广（ 以前混交林均匀种植难调节其间矛盾）

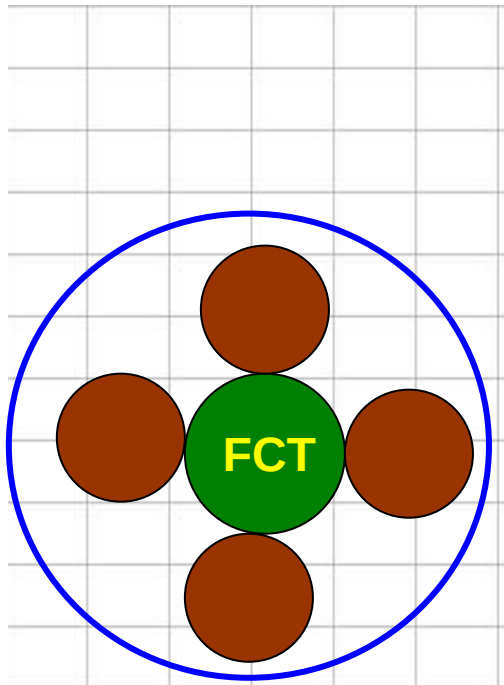
It’s simple to control the competition among tree species or trees by the method of thinning within a clump.

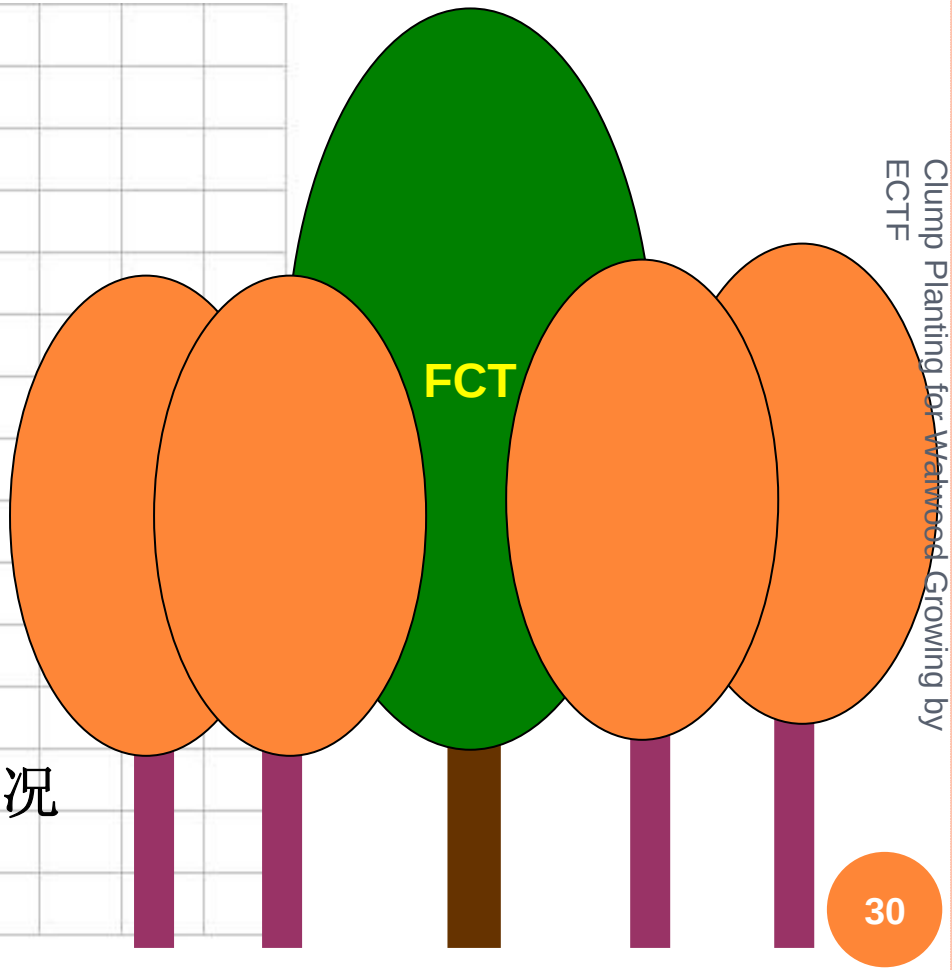
When, Which, How, to thin?

Mixed plantation with Castanopsis and Massion pine at age of 9 years

从内间伐法调节种间或树间矛盾，非常简易

It’s easy to control competition of trees within a clump.



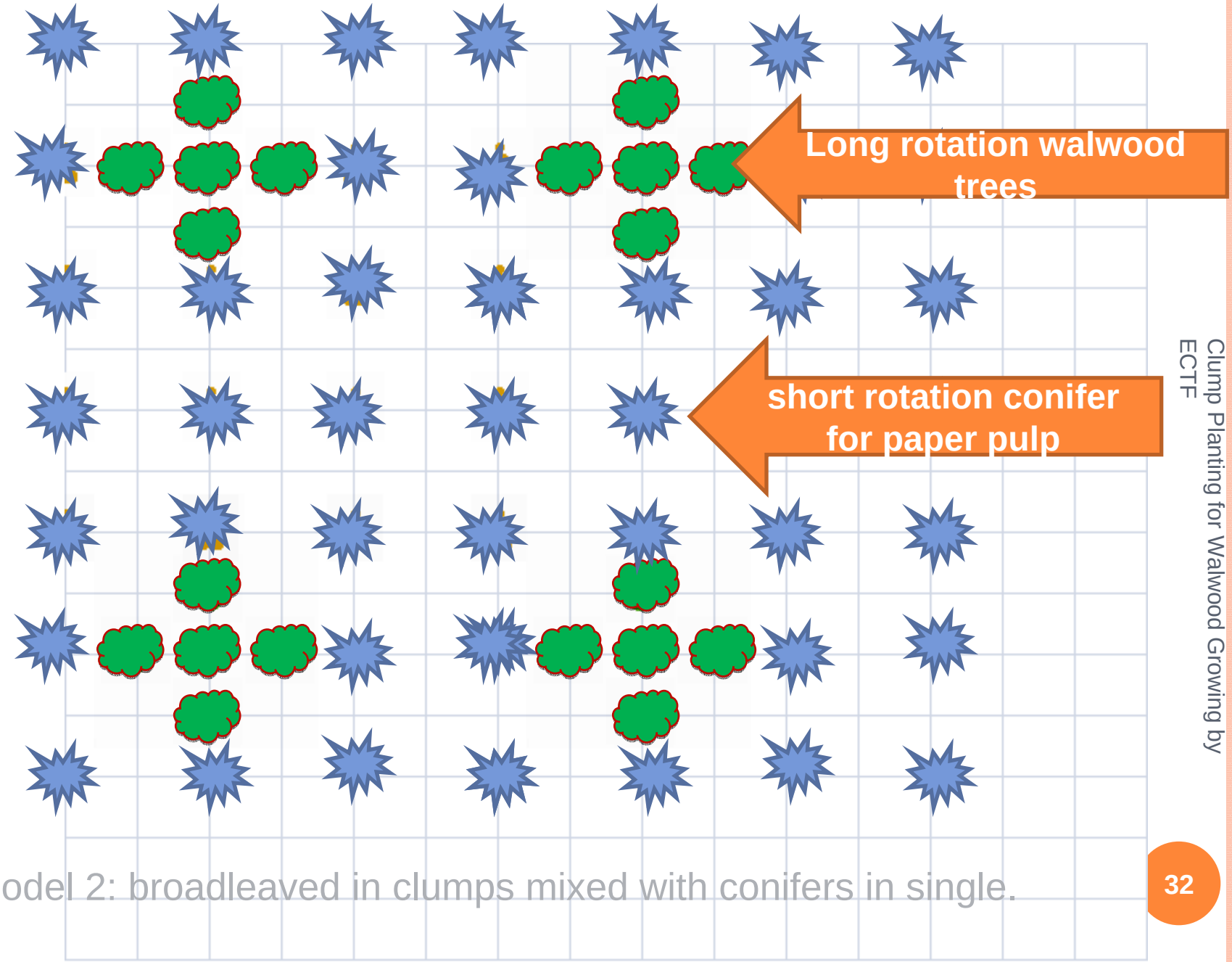


视目标树冠形及干形发育情况

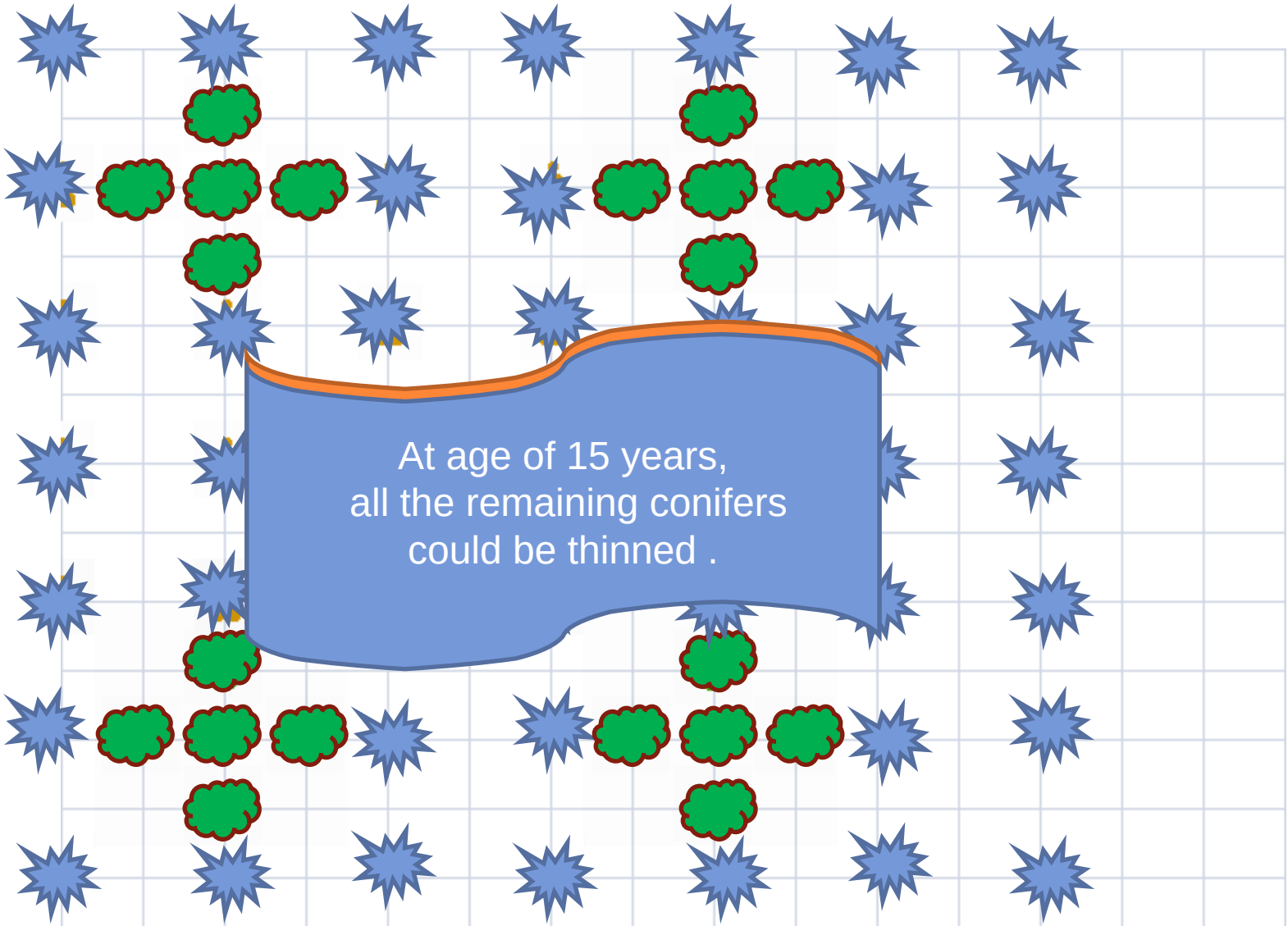
分**1-4**次疏伐伴生树

4 容易为社会接受的模式
The models could be easily accepted by the public

以短养长方式，降低投资风险，经济效果好。It could reduce the risk of investment of reforestation by taking the business strategy 'combining long rotation of walwood with short rotation of high economic crop or woody biomass'.



Model 2: broadleaved in clumps mixed with conifers in single.



Model 2: broadleaved in clumps mixed with conifers in single.

PART 4

珍贵树种丛植混交林造林实践

Mixed clump planting of walwood in practice

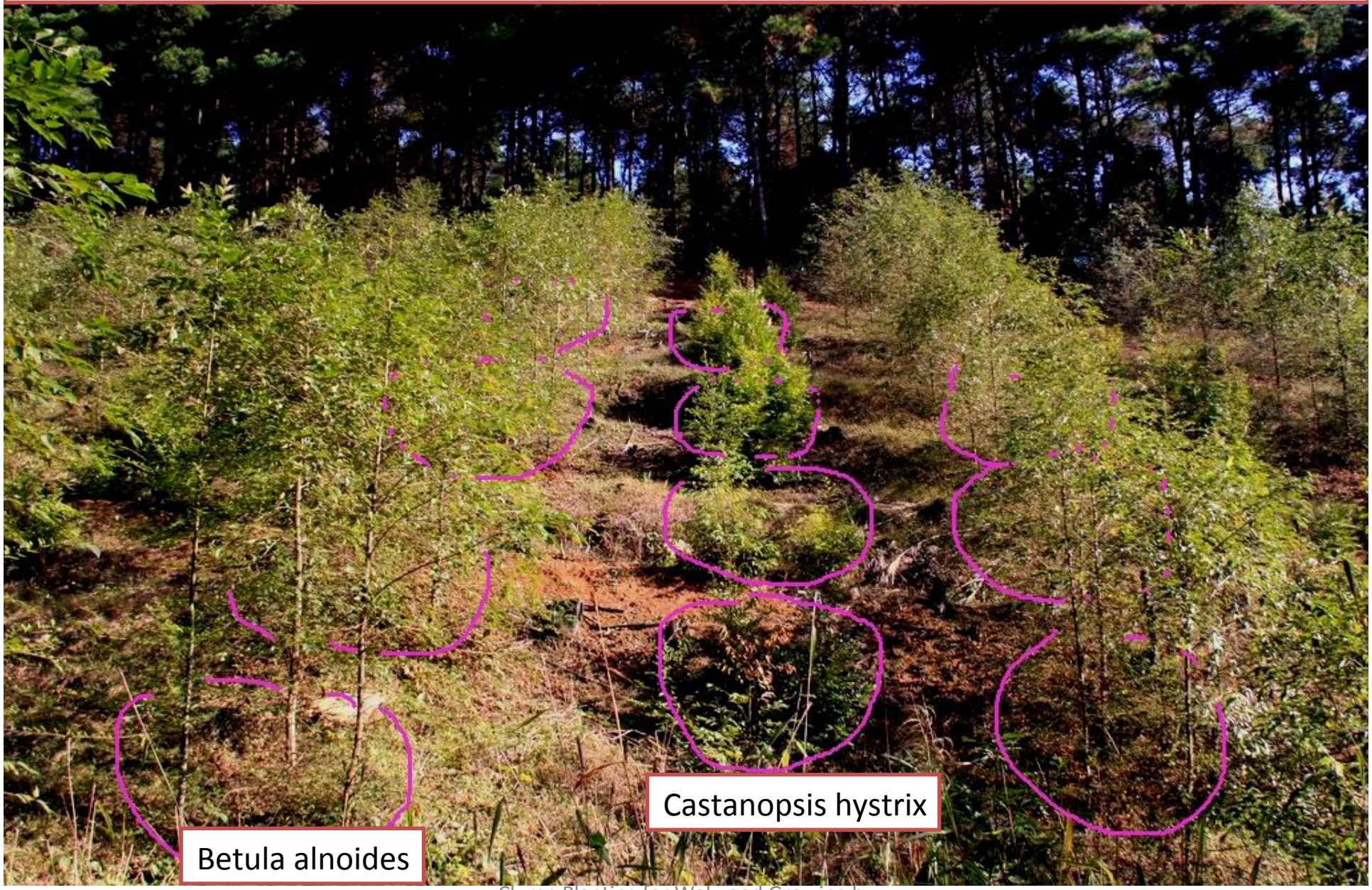
Model 1 (betula mixed Chinese fir in clump)

2年生西南桦杉木丛状混交林

Model 3 (Mixed plantation with different clumps of walwood trees)

2年生西南桦格木双目标树混交林

Model 3 (Mixed plantation with different clumps of walwood trees)



The experience from Germany are much helpful for us.


THANK YOU
FOR YOUR ATTENTION!
谢谢您的关注！