



NSC 2016 Winter Conference:

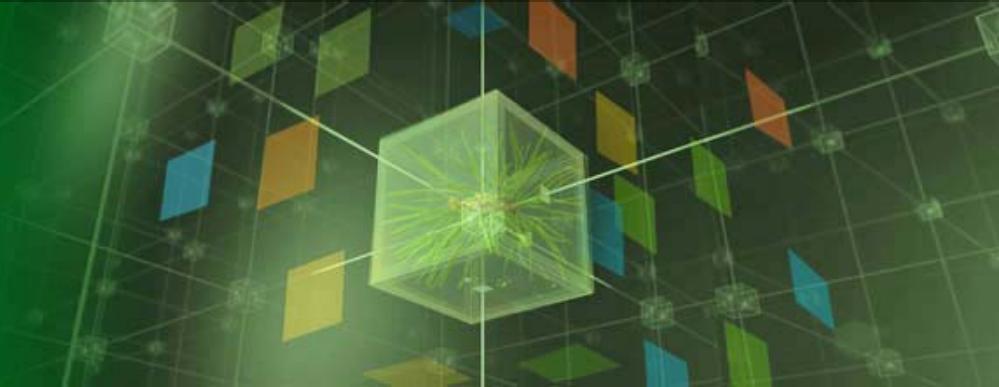
Improving silviculture planning and practice from current standards to our future forests

February 16-17, 2016

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Partial cutting and secondary stand structure management:

Past experience, current knowledge and potential applications

Philippe Meek

Prince George, February 2016



Ecological issues addressed at the stand level by the loggers

- Stand structure aiming at old growth forests
- Dead wood (standing snags or grounded CWD)
- Mature and over mature forests
- Composition
- Endangered species habitat (ex. woodland caribou)
- Habitats of game species
- Visual quality of landscapes

Presentation overview

■ Past experience

- Maintain forest values and wood product development
- Tools for even-aged and/or uneven-aged management
- Specialized equipment's

■ Current knowledge

- Partial cut to find alternative wood to support AAC
- Economics of PC and goals setting
- Supervision and control

■ Potential applications

- Recommended systems :
- Stand selection :

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OPERATIONAL PERSPECTIVE

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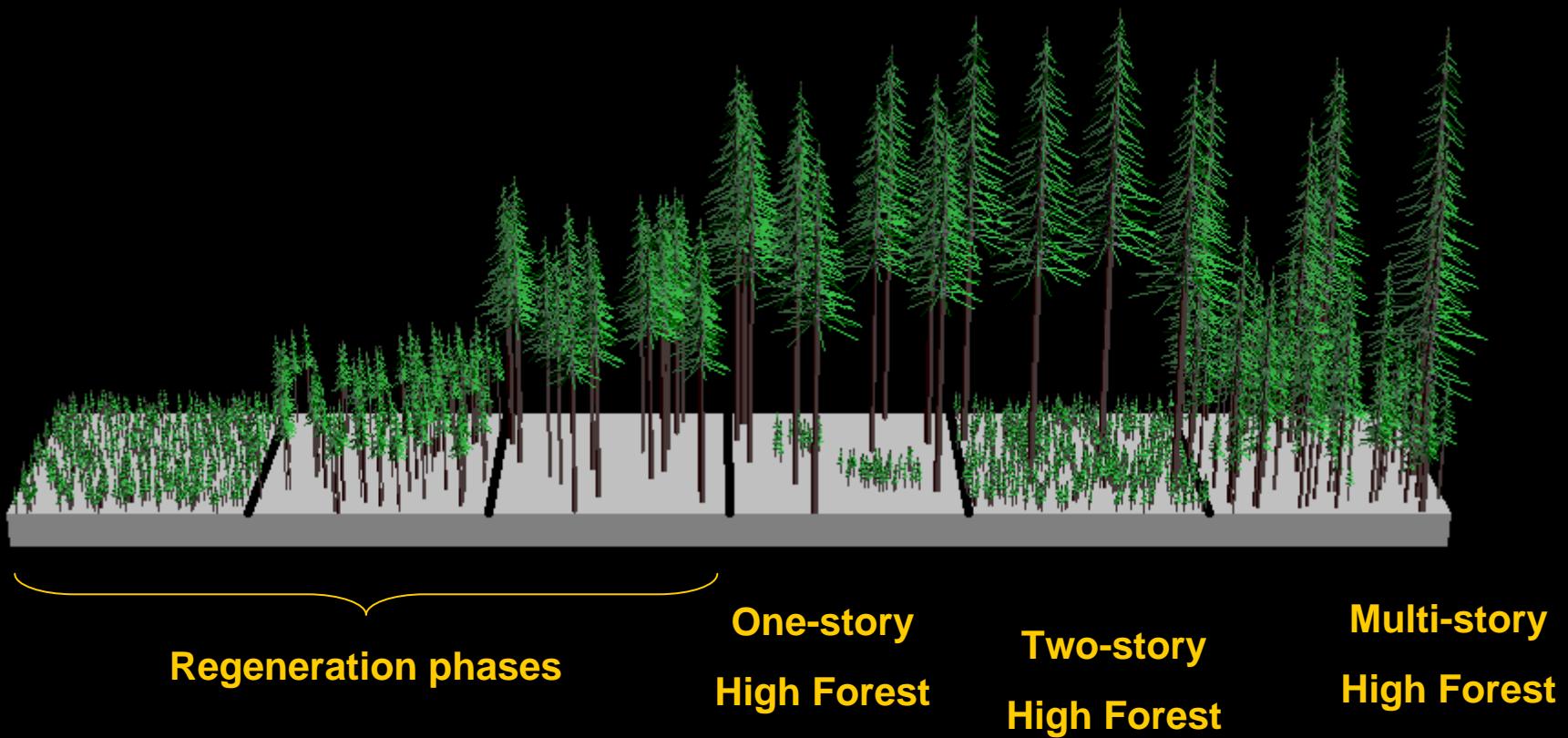
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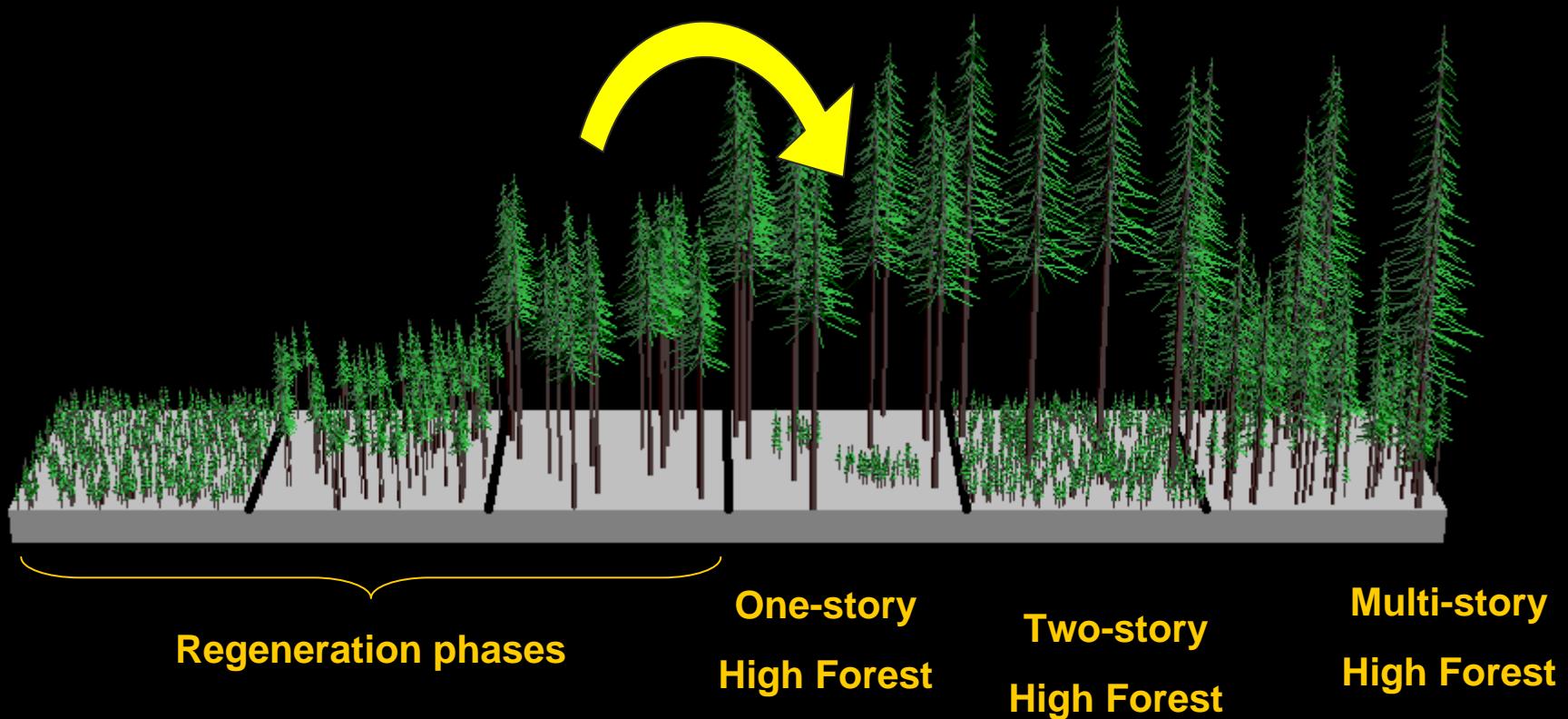
■ Potential applications

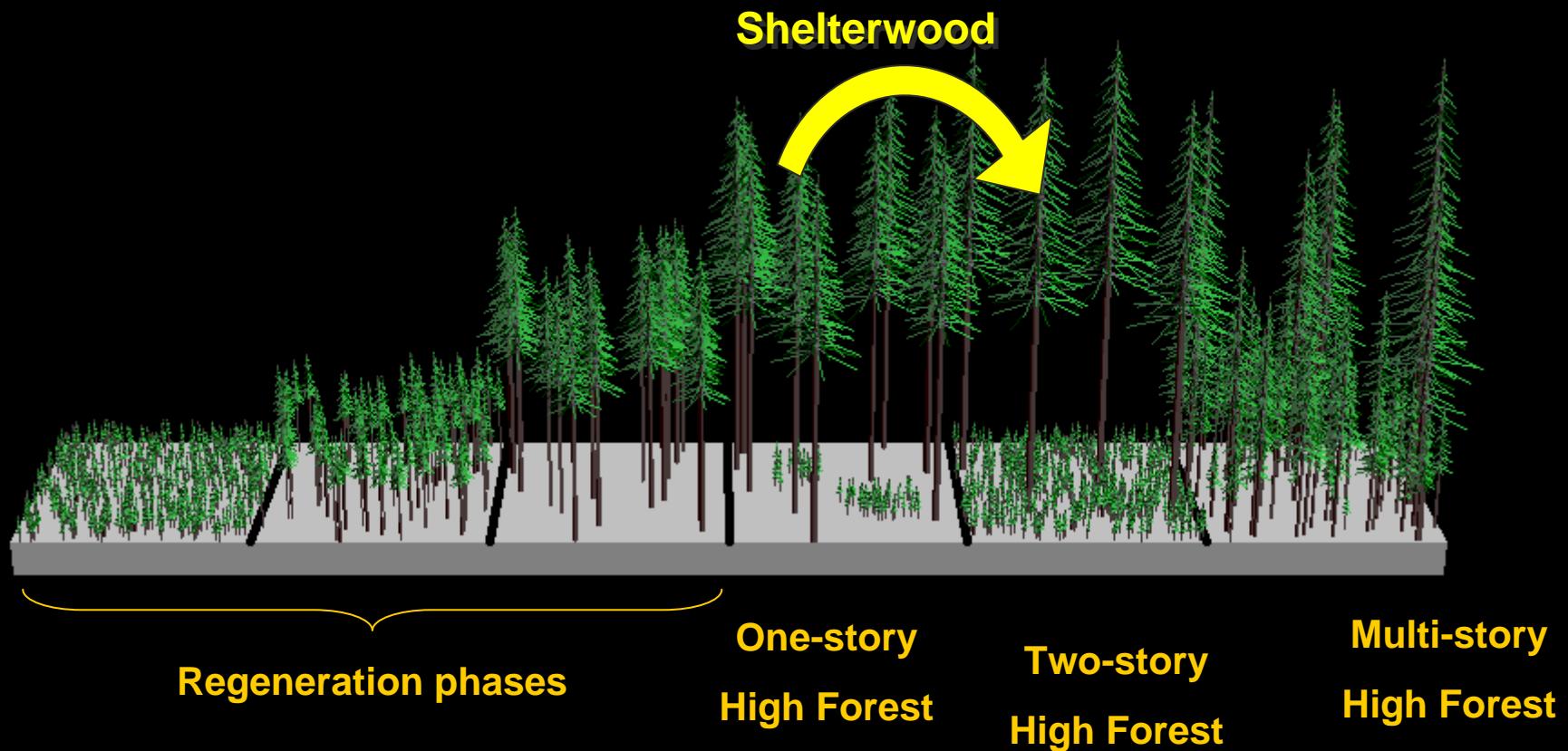
- Recommended systems :
- Stand selection :

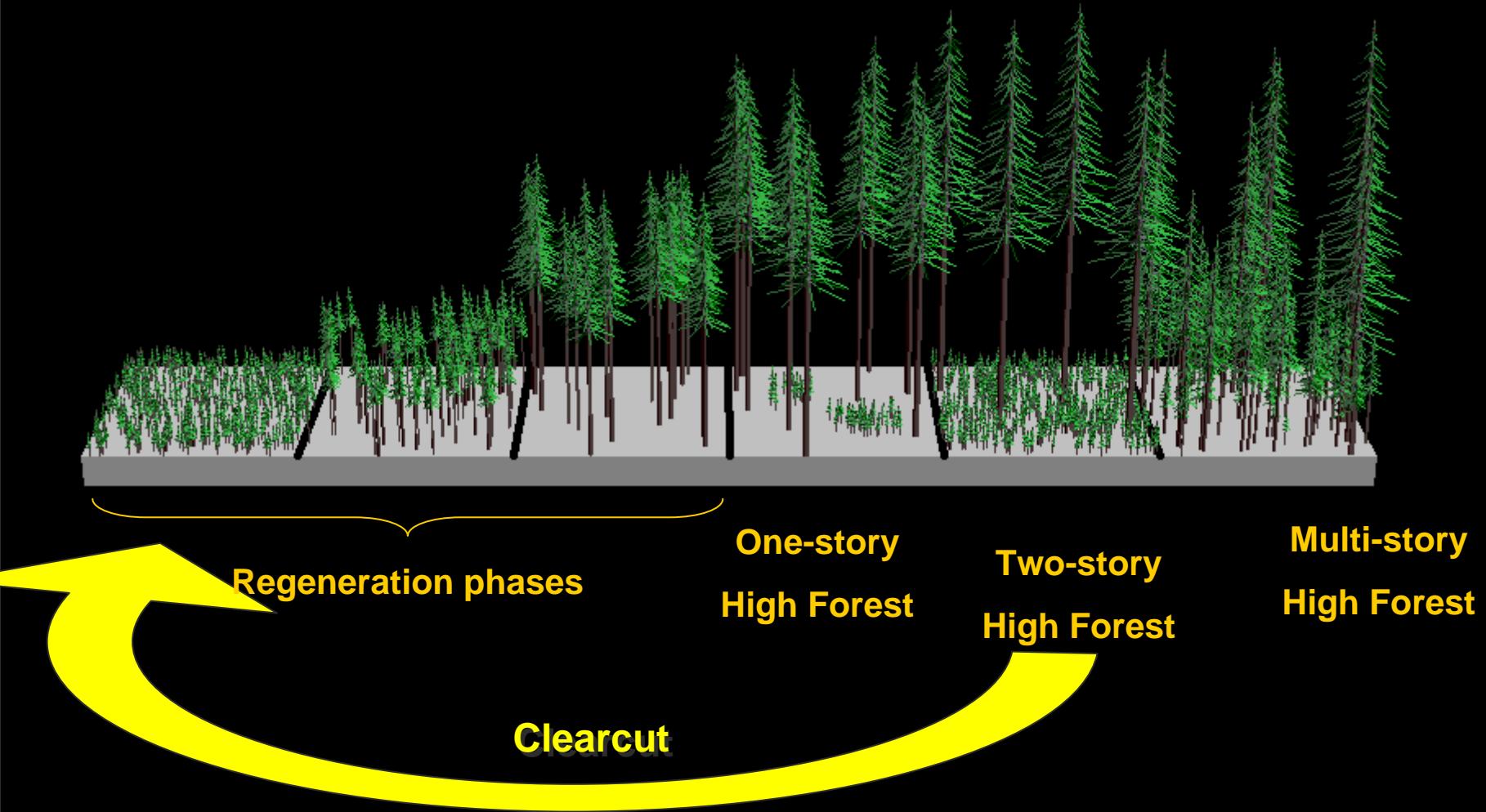
Tools for even-aged and/or uneven-aged management



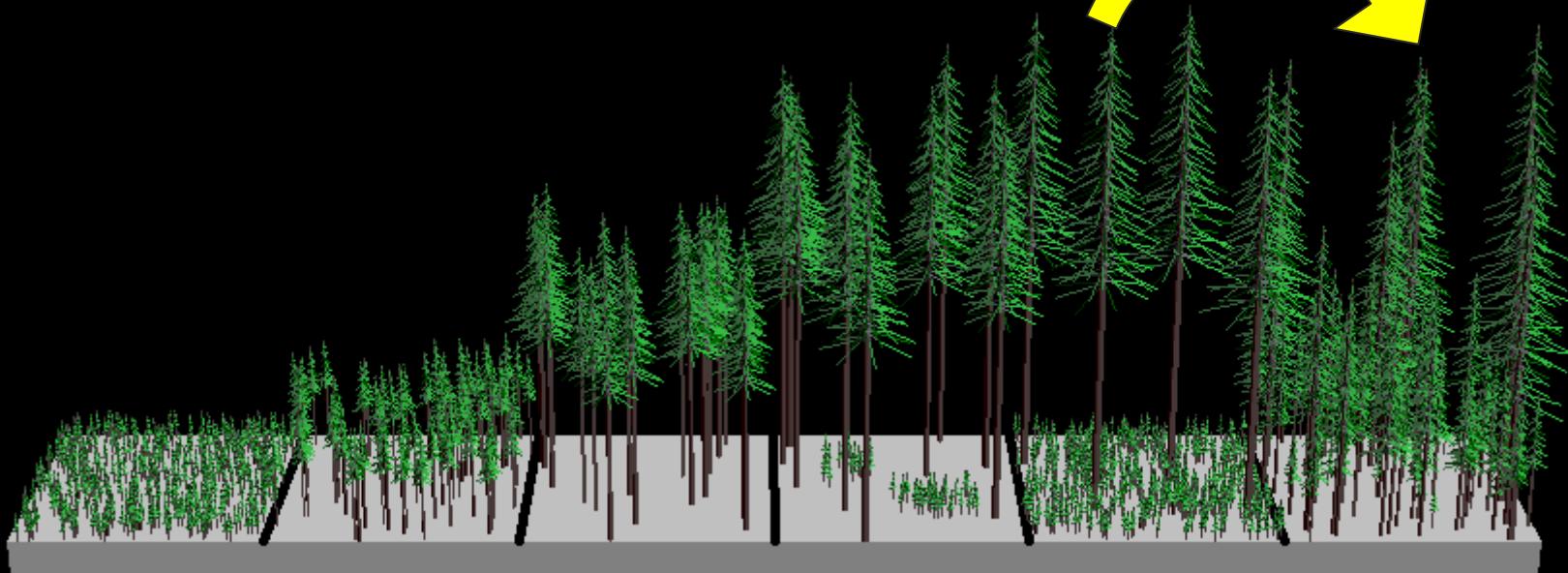
Commercial Thinning







Selection Thinning

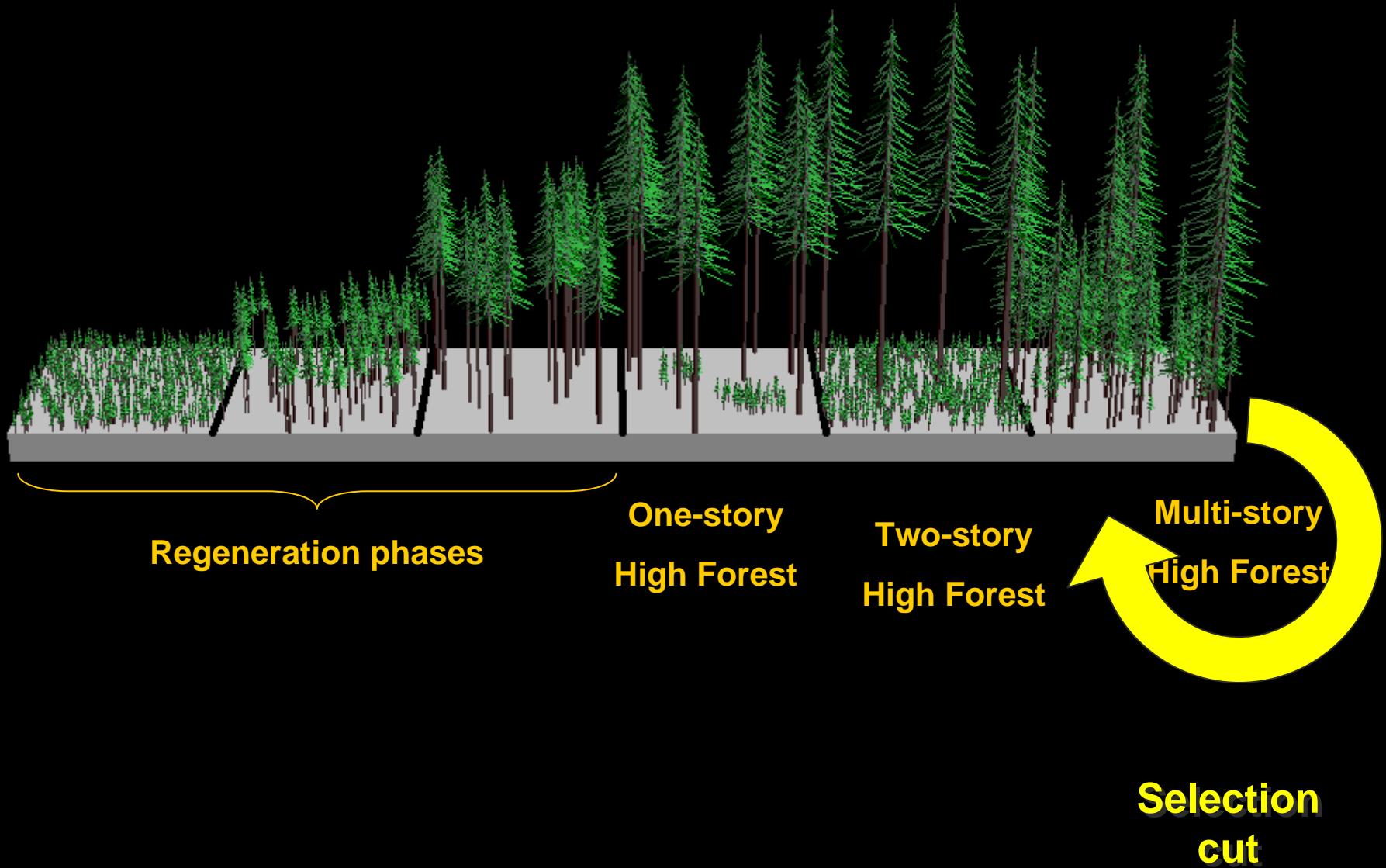


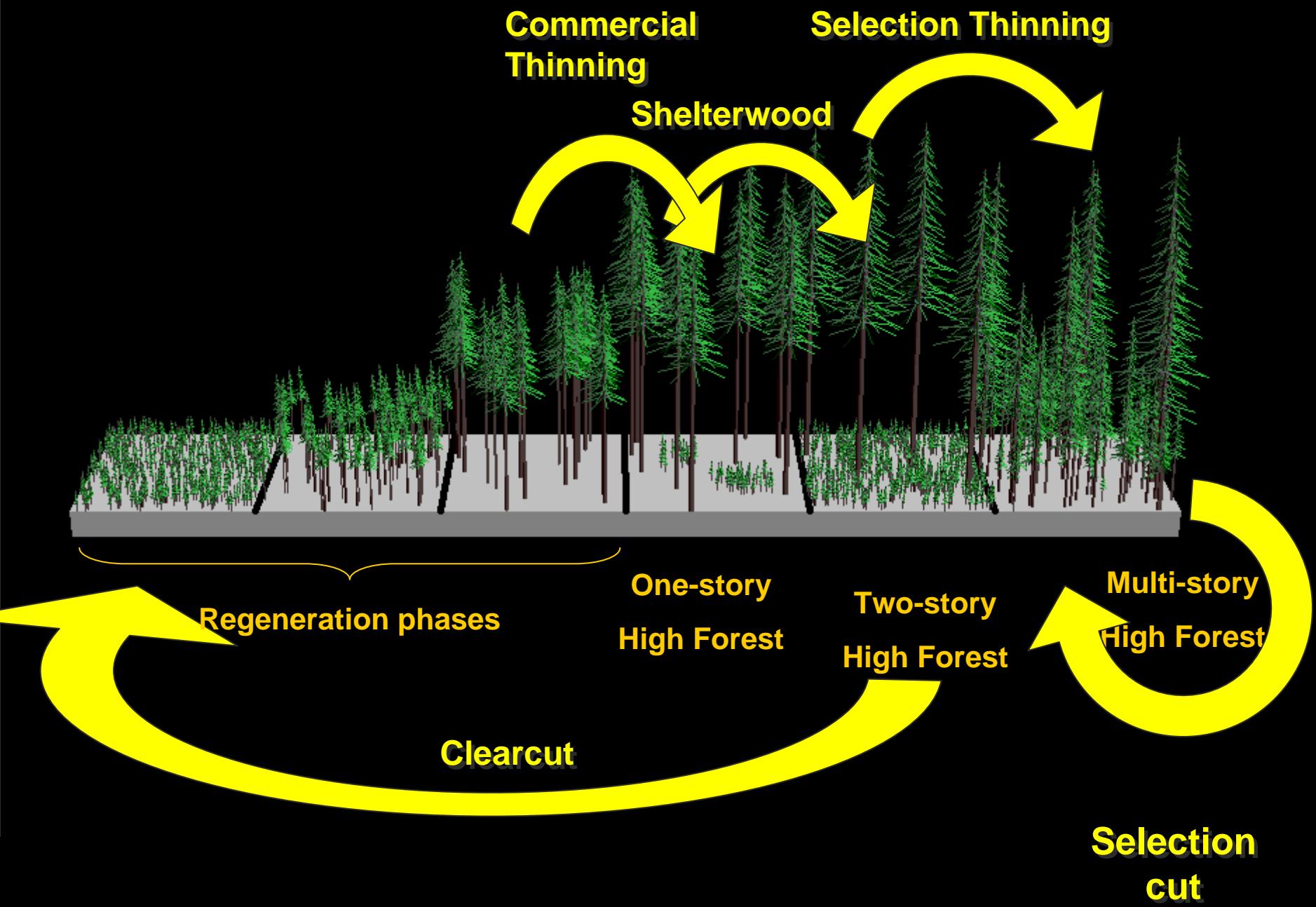
Regeneration phases

**One-story
High Forest**

**Two-story
High Forest**

**Multi-story
High Forest**





Learning : All partial cuts aren't the same

**Commercial Thinning
from below**



Smaller trees = \$\$\$

**Commercial Thinning
from above**



Mid sized trees = \$\$

Shelterwood



Selection Thinning



Larger trees = \$

Selection cut



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NON Réserve aux membres et p

Contentu

- Introduction 1
- Conditions de l'abattage 2
- Résultat 2
- Mise en application 4
- Recommandations 4
- Référence 4

Auteur

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Division de l'Est

Éclat de No

Résumé

ERIC a étudié deux types d'abattage-fagotage par les prioritaires : l'un pour augm' d'épinette et l'autre pour mérme moyen. Les produ parables dans les deux volume par tige est des ginalisat' tandis que la pas d'effet.

Introduction

Dans le cadre du proj' des éclaircies com' une des études a porté d'un même opérat'neuse dans deux p' d'éclaircie. Un prem' novembre 1999 et privés de Caron S. à Mauricie (Québec) en février 2000 se que à St-Ludger.

Figure 1. L'abattue-fagotée Samsung 1300LCM-II avec Rechte DT et tête Pan 628.

Figure 1. L'abattue-fagotée Samsung 1300LCM-II avec Rechte DT et tête Pan 628.

The image shows the front cover of a magazine or booklet titled "Avantage". The title is prominently displayed in large, bold, white letters across the top. Above the title, there is a circular logo for "FERIC" featuring a stylized tree icon. Below the main title, smaller text reads "NON Réservé aux membres et partenaires de FERIC". To the right, there is another circular logo for "FERIC" with the date "Vol. 1 N° 21 Octobre 2000". The central part of the cover features a black and white photograph of a forest scene, showing a large tree in the foreground and a view through a stand of tall, thin trees towards a body of water or a clearing. The overall layout is clean and professional.

Historic :Small size harvester



Mid-size harvesters



Full-sized harvesters



Shortwood forwarders



Feller-buncher in softwood stands



Uneconomic tested systems



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■ Potential applications

- Recommended systems :
- Stand selection :

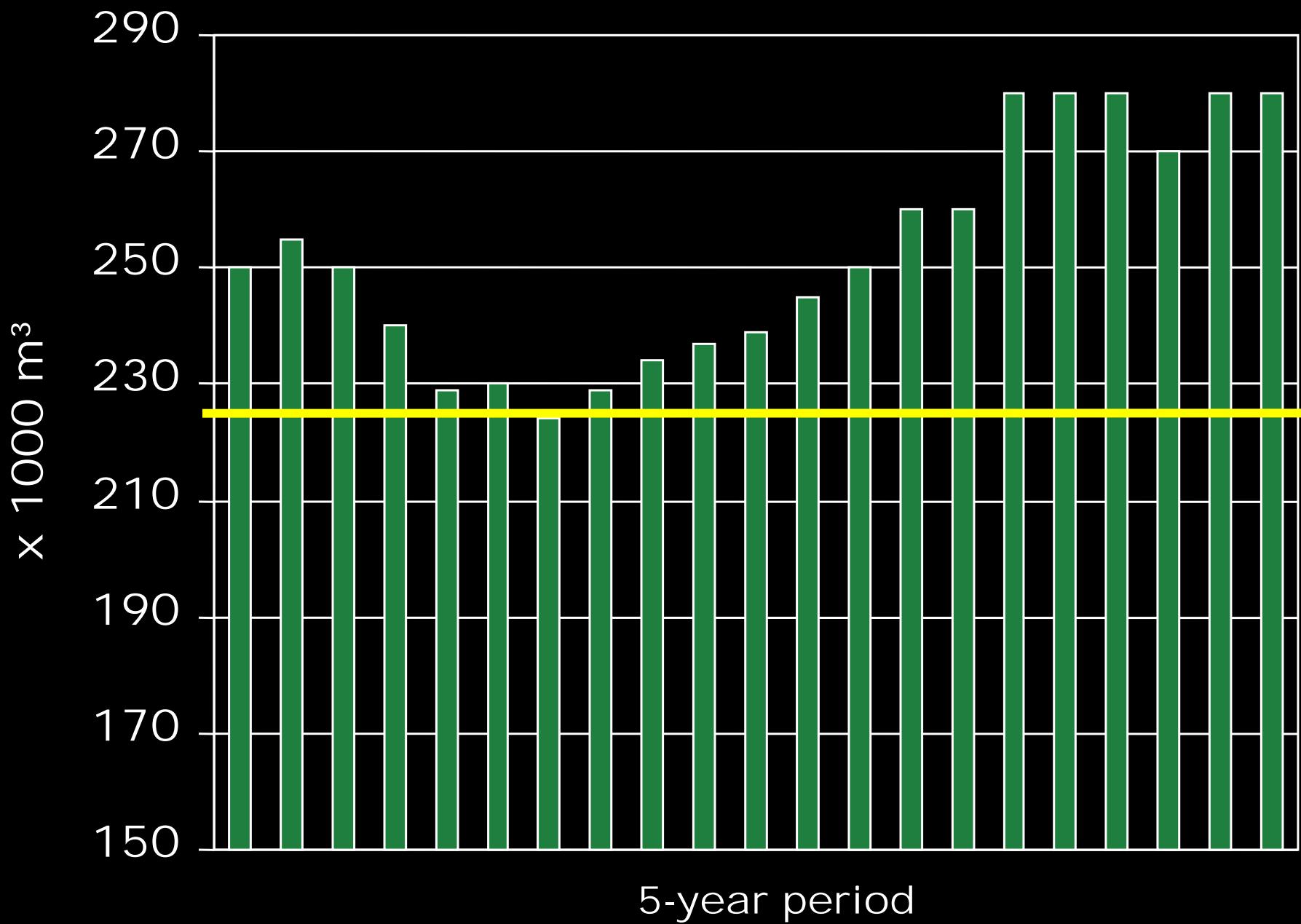
Reminder:

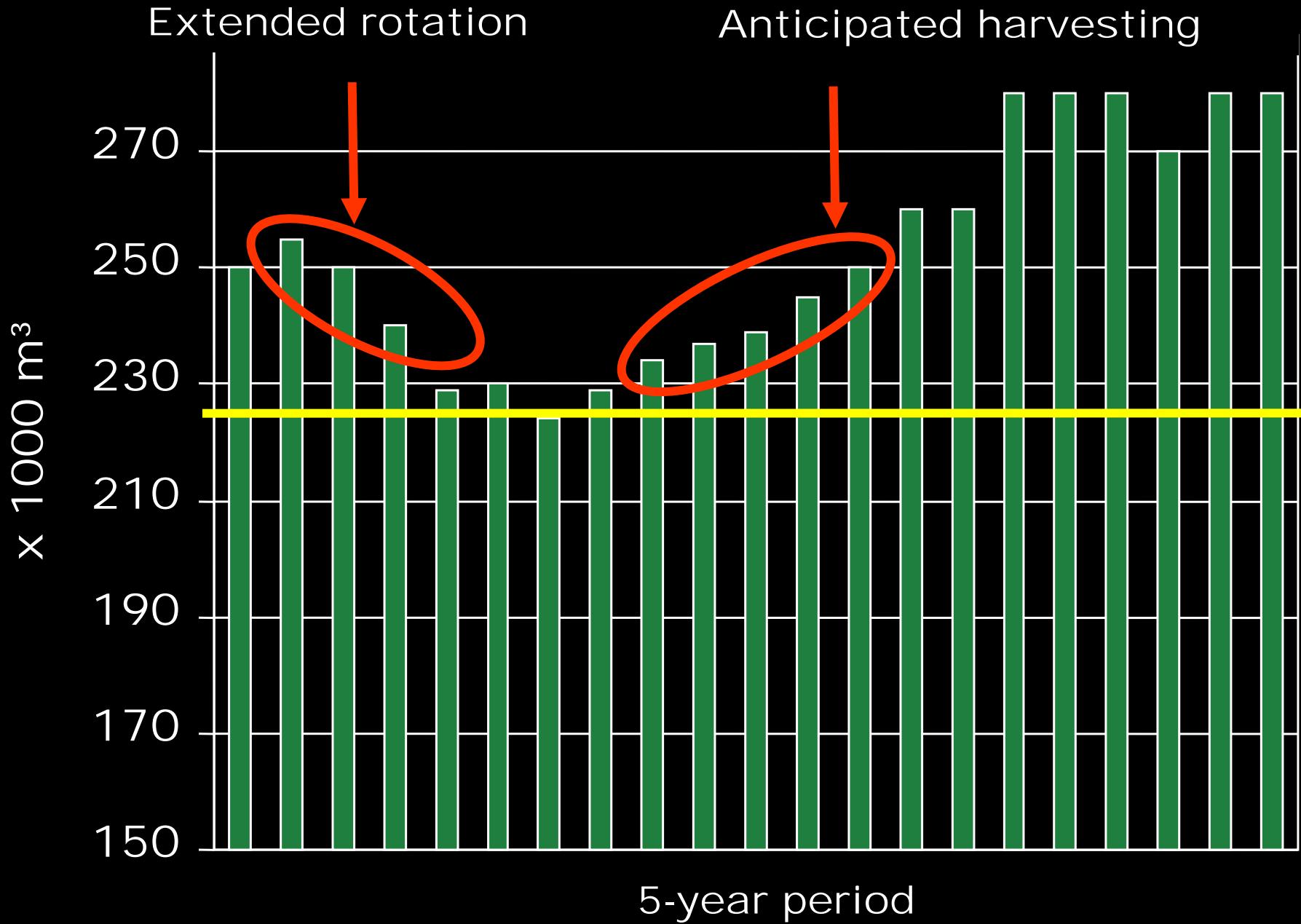
1. As seen in jurisdictions accepting non-declining wood flow : The most cost-effective silvicultural treatments are those that allow to increase the mill procurements now.
2. Be clear on what is a mature tree (value, size ...)
3. Partial cuts can change the wood flow from the forest to the mills by proposing alternative volume and timing of deliveries.

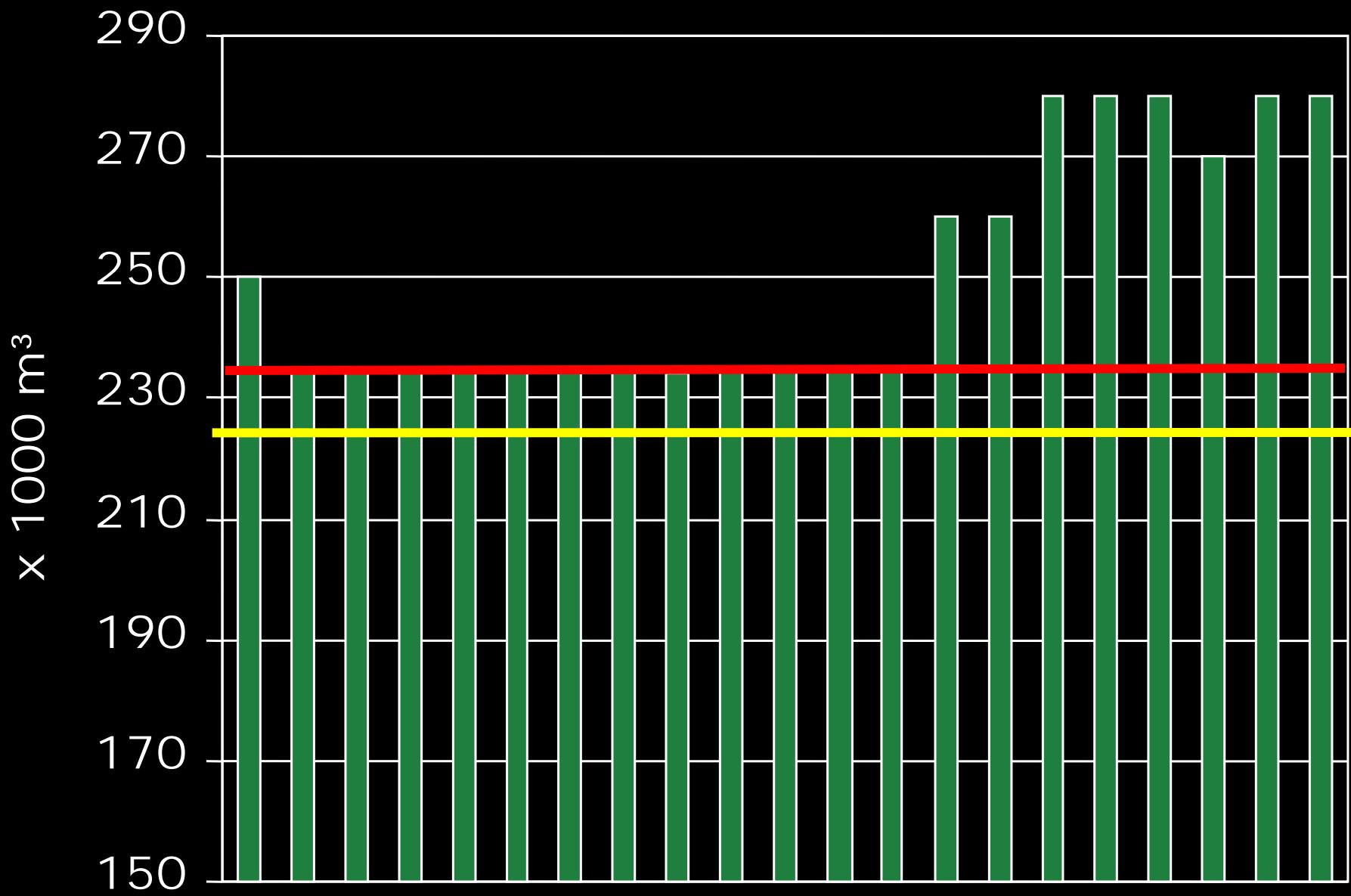
4 Partial Cutting Strategies:

For selected stands :

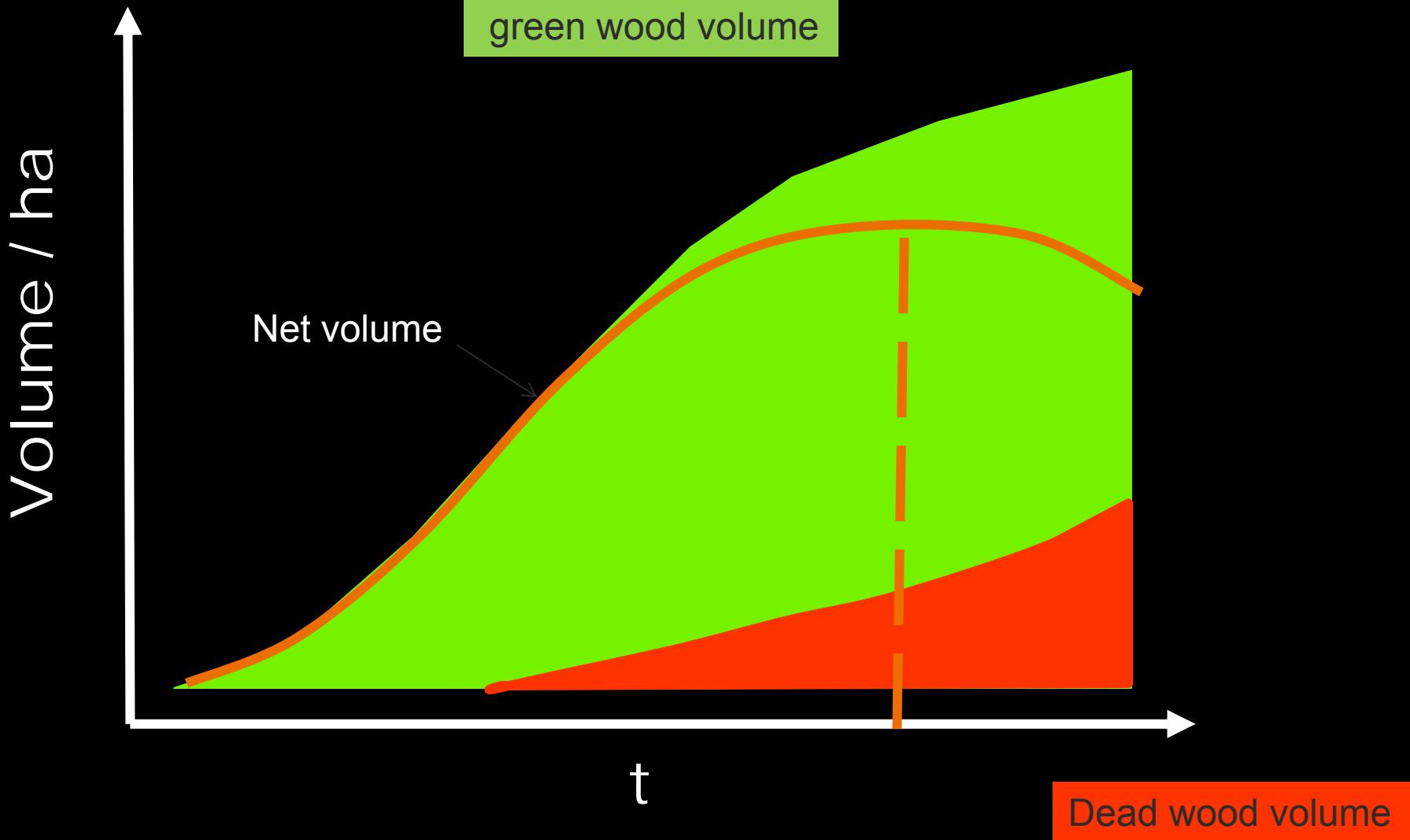
- 1. Extended rotation**
- 2. Anticipated harvesting**
- 3. Mixedwood management**
- 4. Shortened rotation**



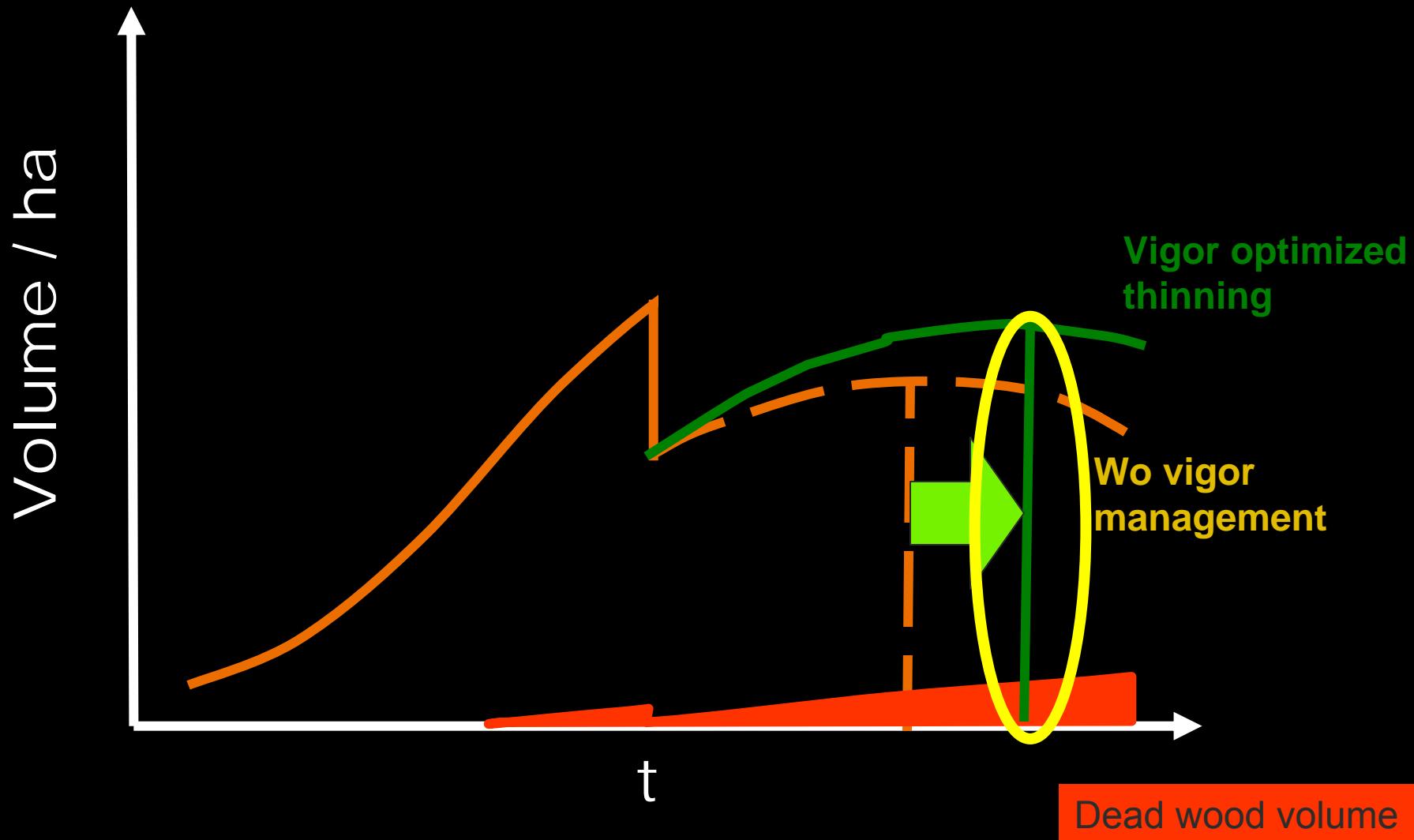




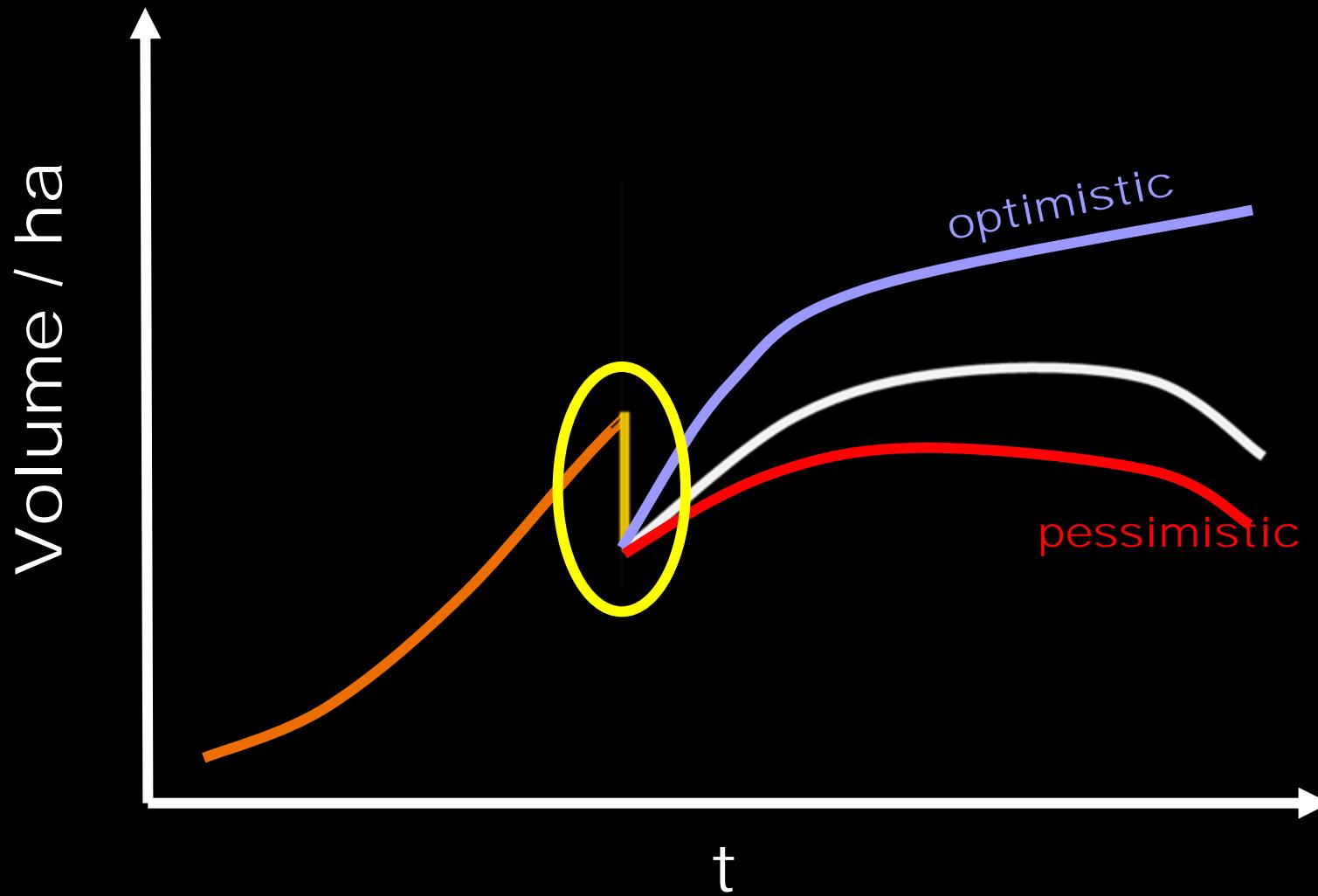
1st : Extended Rotation



Extended Rotation : CT to Reduce Natural Mortality



2nd : Anticipated Harvesting



Commercial Thinning: No

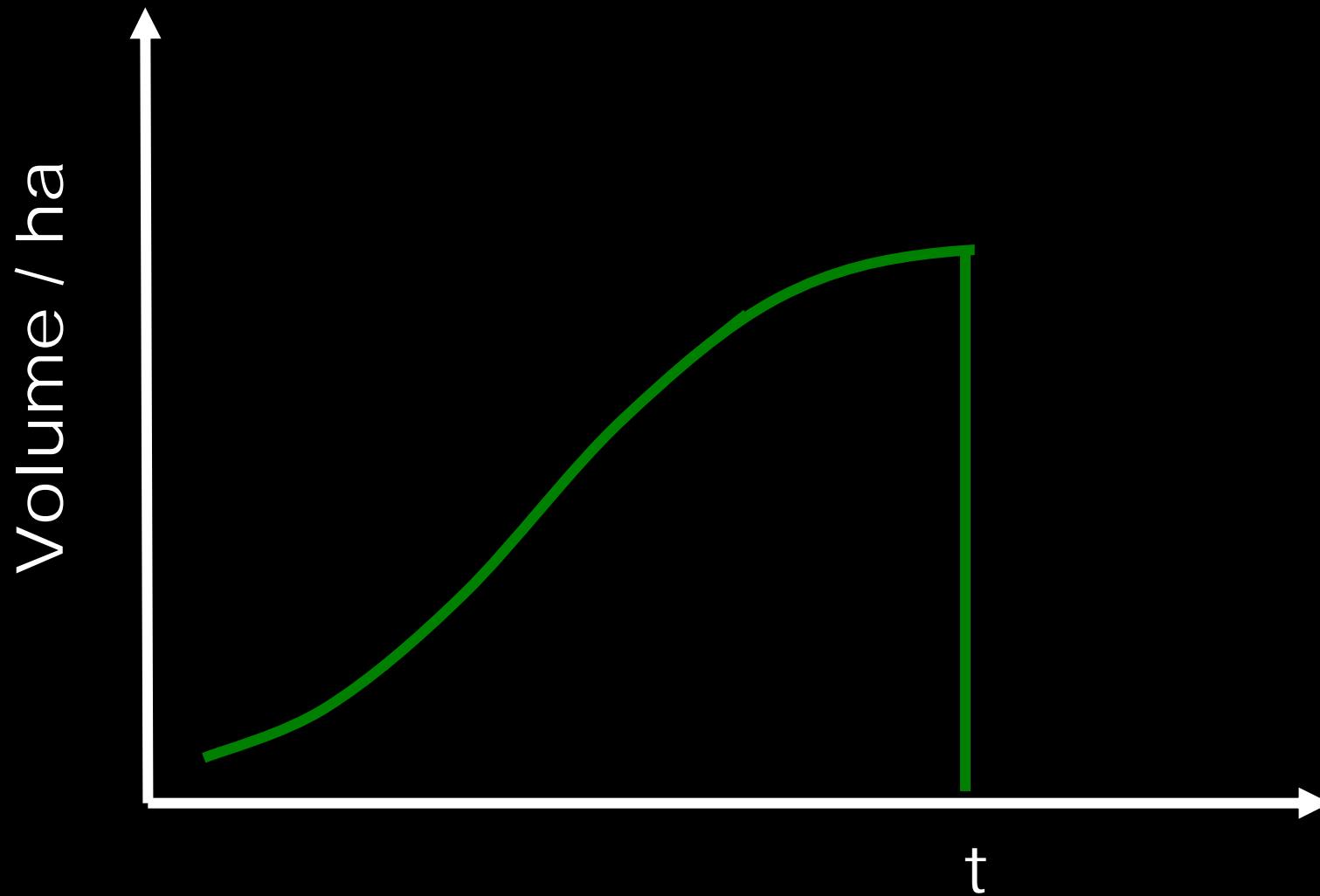
Shelterwood: Yes



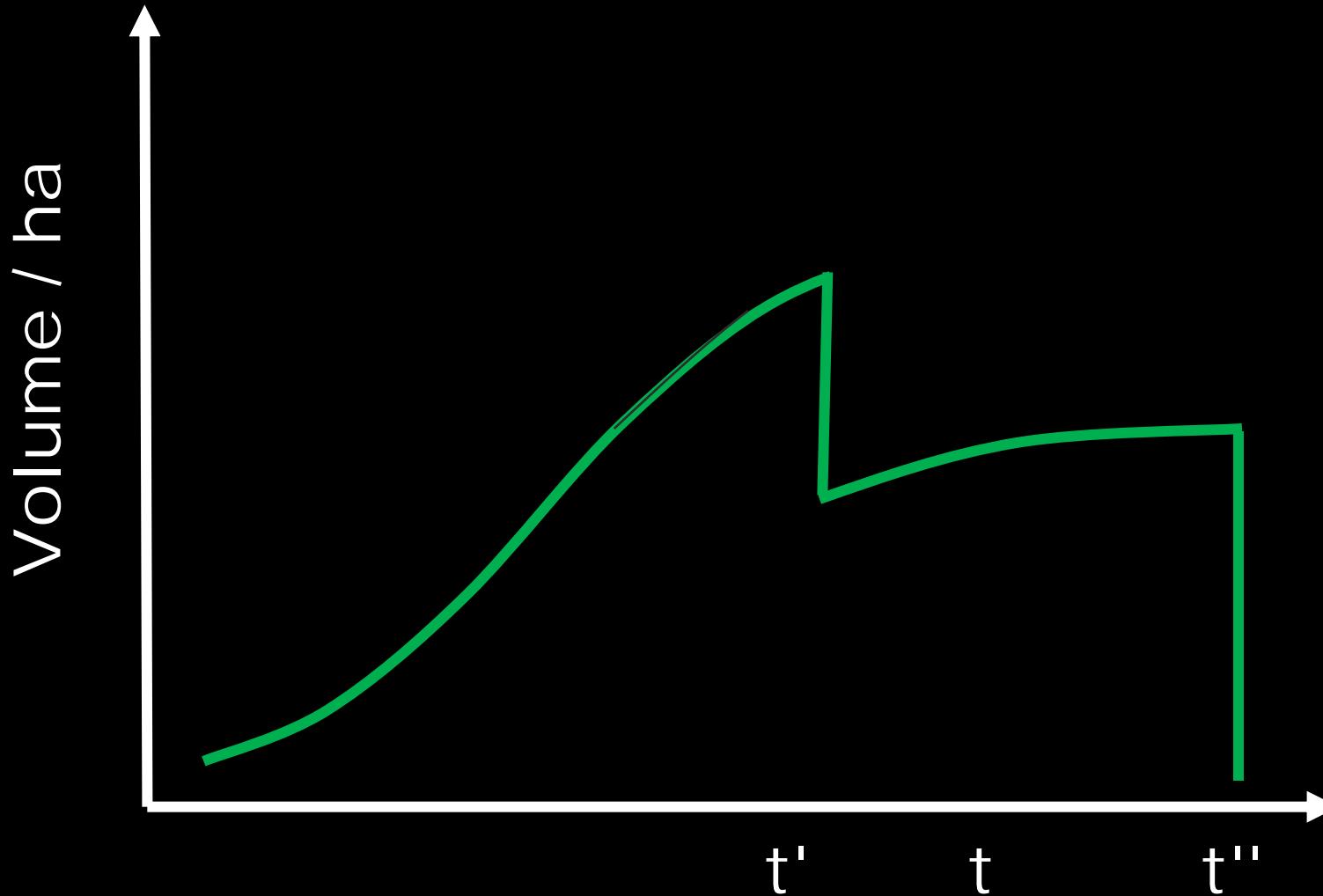
3rd strategy :
Mixedwood stands or Two-storied



Normal Rotation



Harvest Timing is Different





4th strategy : Shortened Rotation

Technical maturity (target dia)







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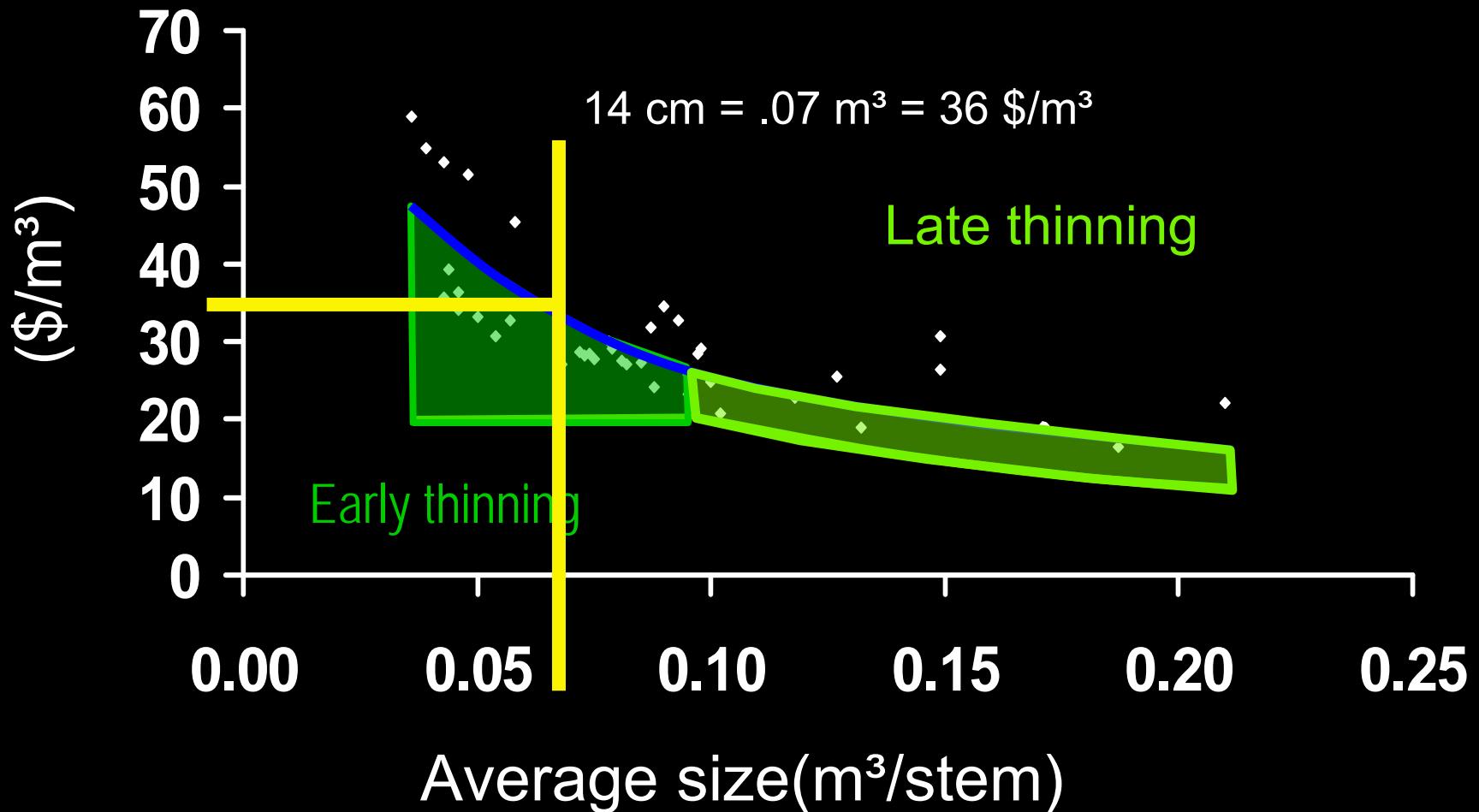
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- Supervision and control

■ Potential applications

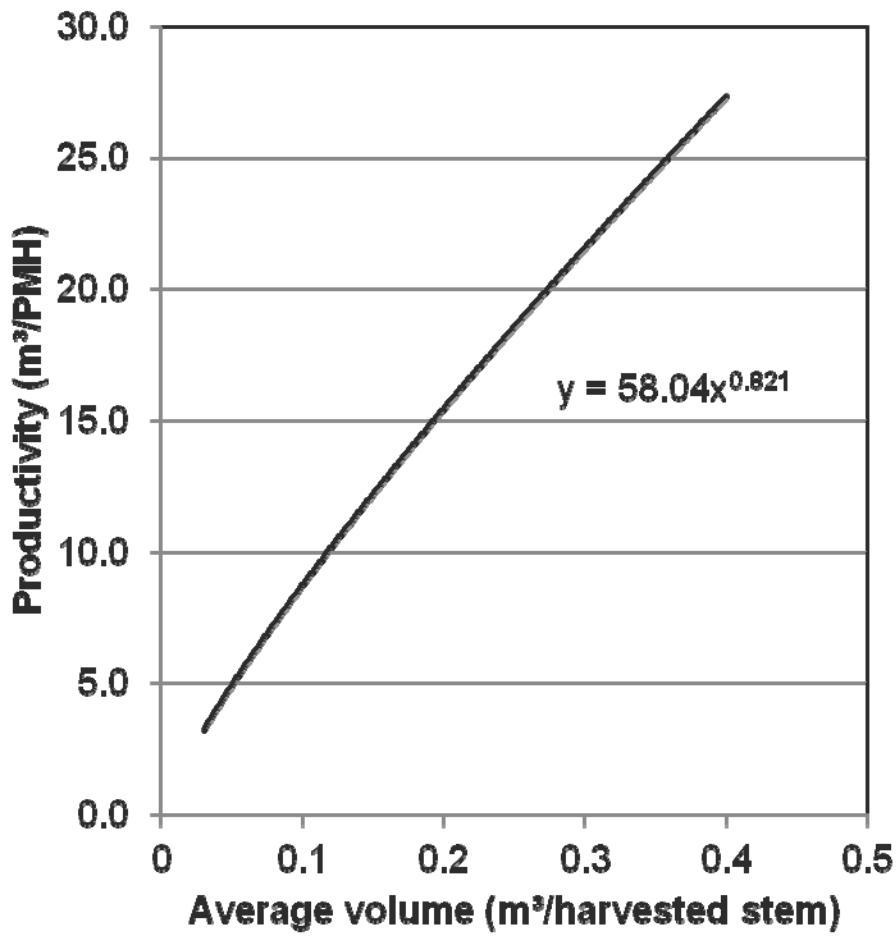
- Recommended systems :
- Stand selection :

CTL Thinning roadside cost

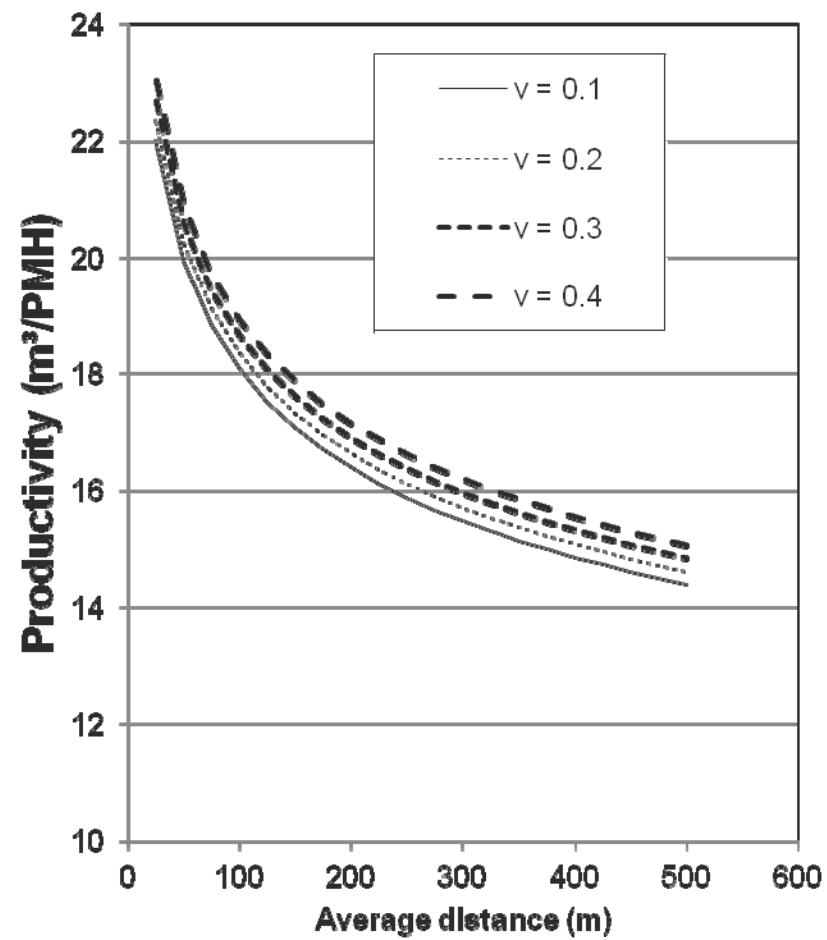


Machine productivity

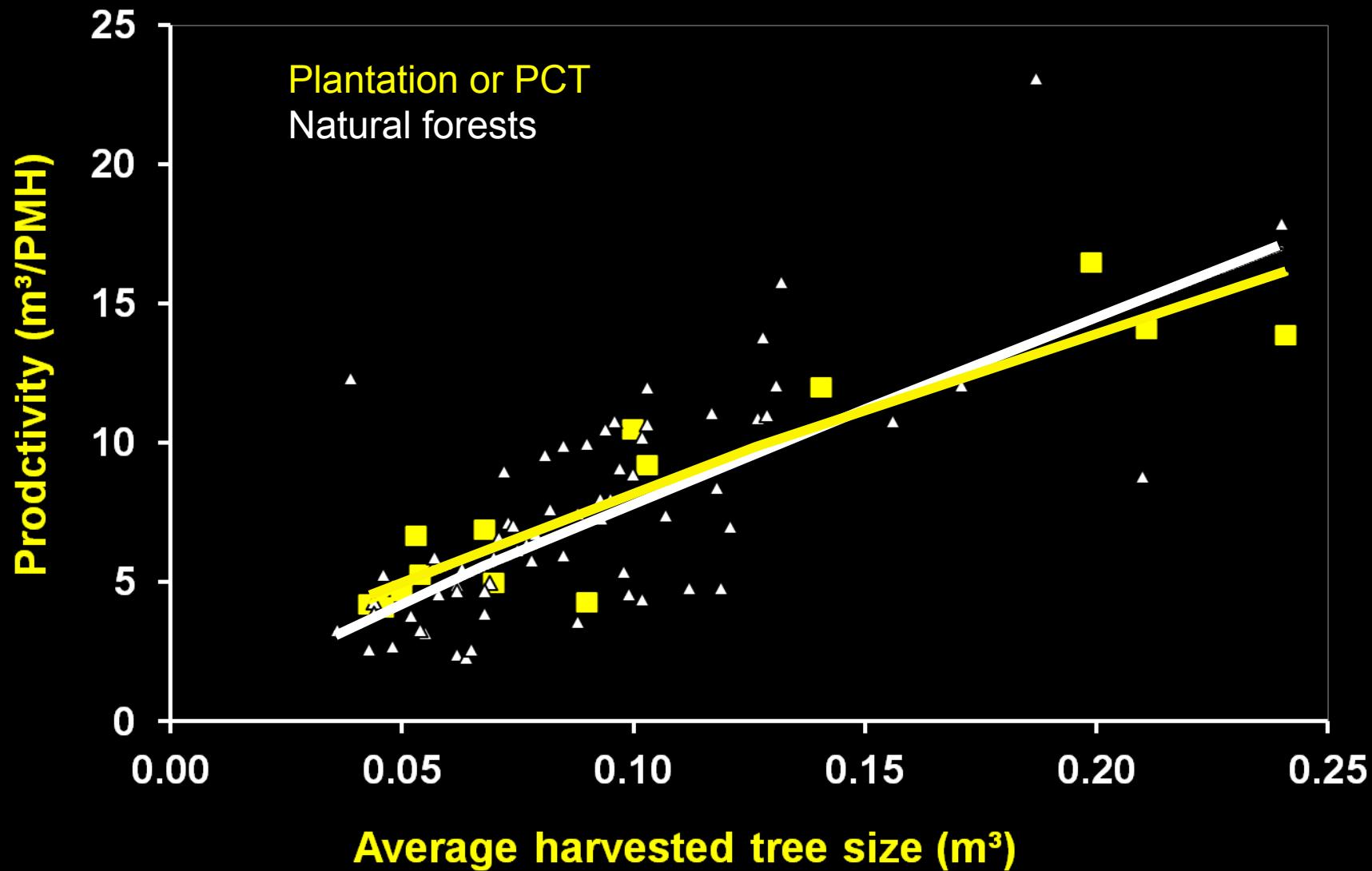
Harvester



Forwarder

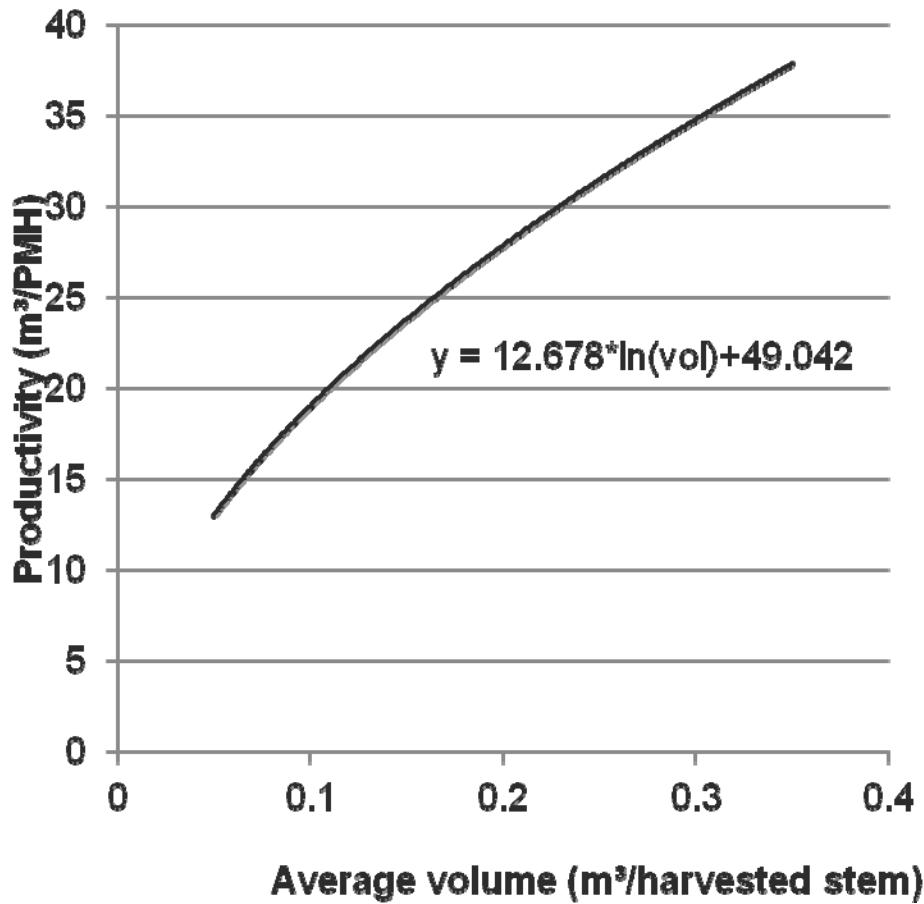


CT harvester productivity

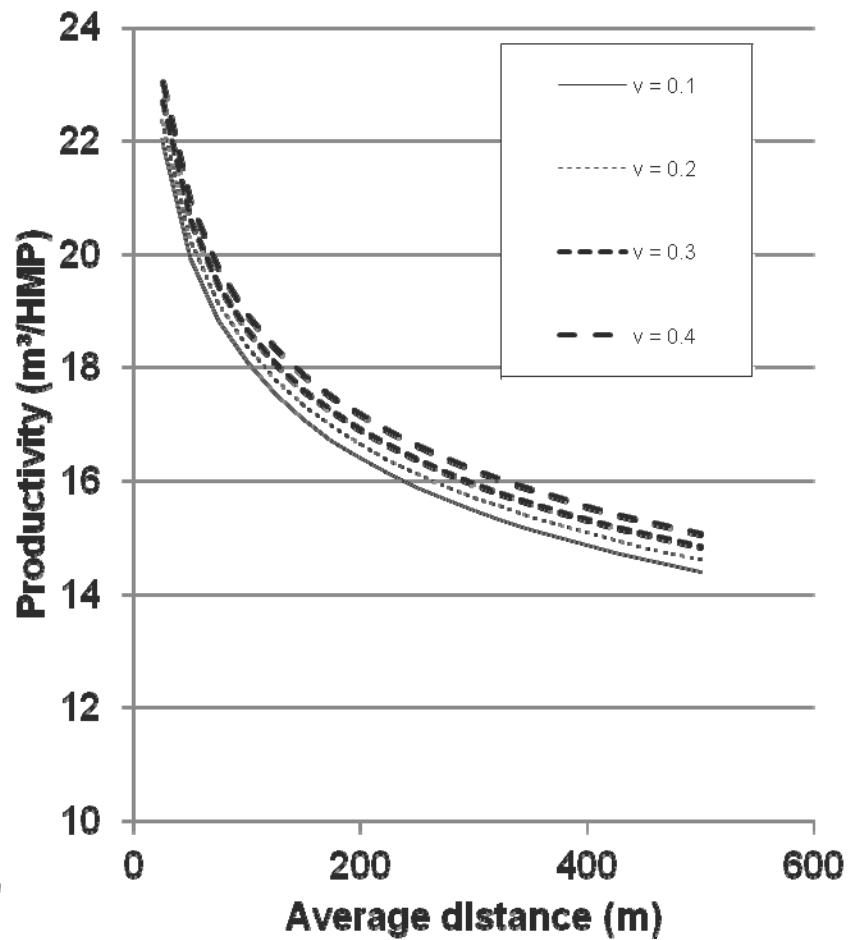


Machine productivity

Feller-Buncher



Skidder



Learnings from 3 CT variants in Rimouski

Experiment held in QC

Spruce plantations (30-35 y)

Removal : 1/3 of volume

3 variants : below, above, quality

Very high % of good vigor tree
before/after

Specialized harvesters :



John Deere 1070



Valmet 901



Neuson 11002



Results of the Rimouski experiment

		Quality thinning		Thinning for below		Thinning from above	
Machine		Harvester	Forwarder	Harvester	Forwarder	Harvester	Forwarder
Average stem size	(m ³)	0.103		0.103		0.103	
Harvested tree size	(m ³)	0.103	(100 %)	0.094	(91 %)	0.109	(106 %)
Average skidding distance	(m)	-	150	-	150	-	150
Productivity	(m ³ /PMH)	9.0	17.6	8.5	17.5	9.6	17.8
Hourly rates	(\$/PMH)	157	124	157	124	157	124
Direct costs	(\$ / m ³)	17.44	7.05	18.47	7.09	16.35	6.97
Total direct costs	(\$ / m ³)	24.49		25.56		23.32	
Sale revenues	(\$ / m ³)	16		16		16	
Silvicultural budget	(\$ / m ³)	8.49		9.56		7.32	
Silvicultural budget	(\$/ha)	340		382		293	

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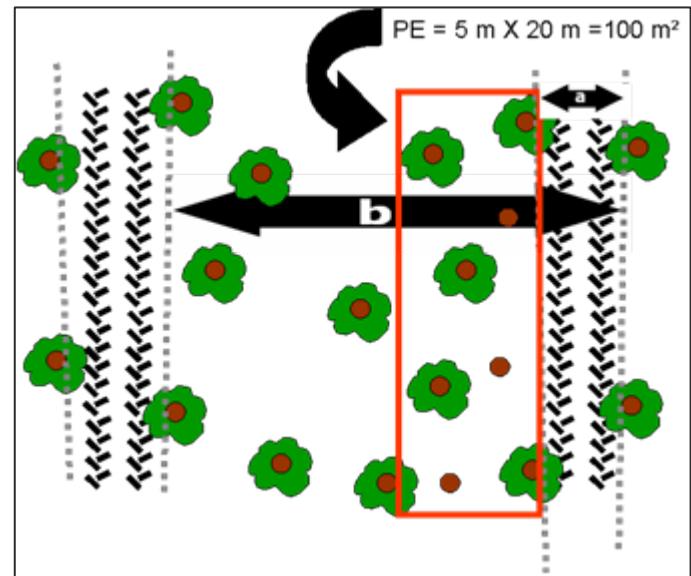
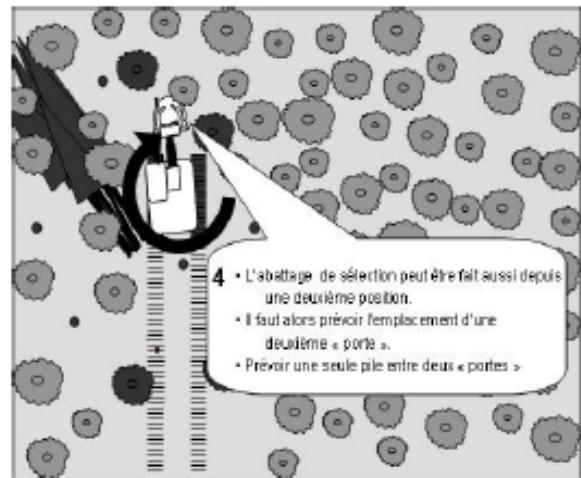
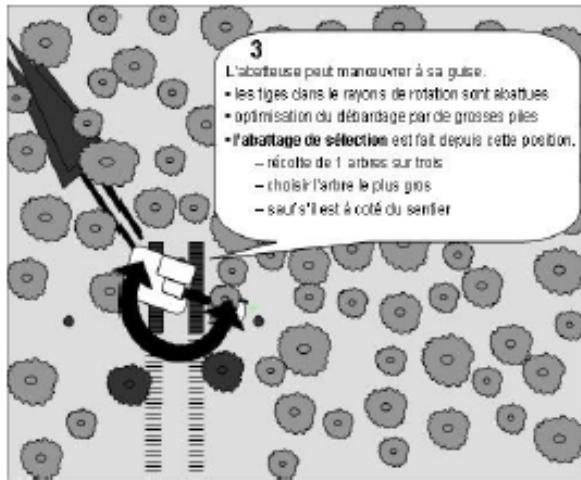
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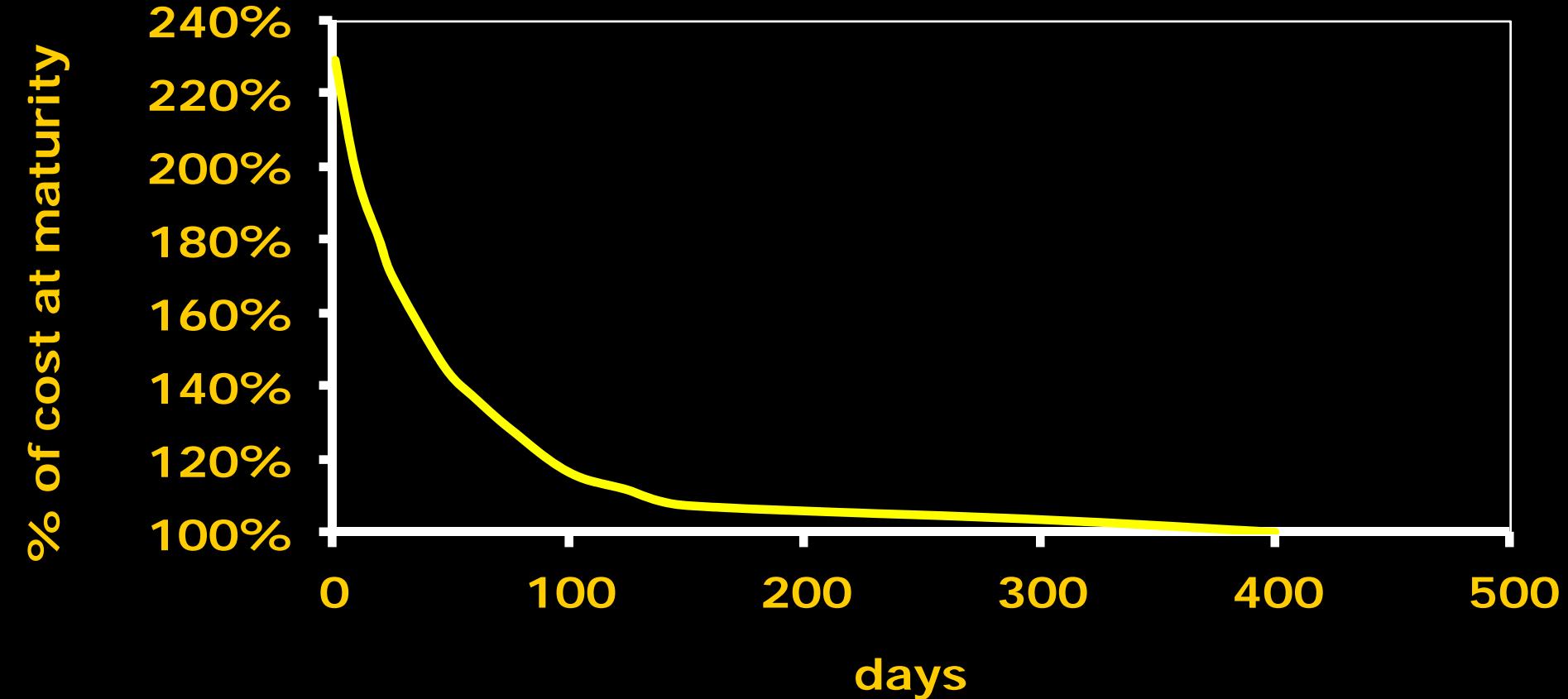
■ Potential applications

- Recommended systems :
- Stand selection :

Operator's guide and first-line supervisor control tools



Harvester operator learning curve





Dense network of sample plots before/after
to provide feedback



Tolerance for damage

Presentation overview

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- Recommended systems :
- Stand selection :

Recommended systems



Recommendations

Working methods

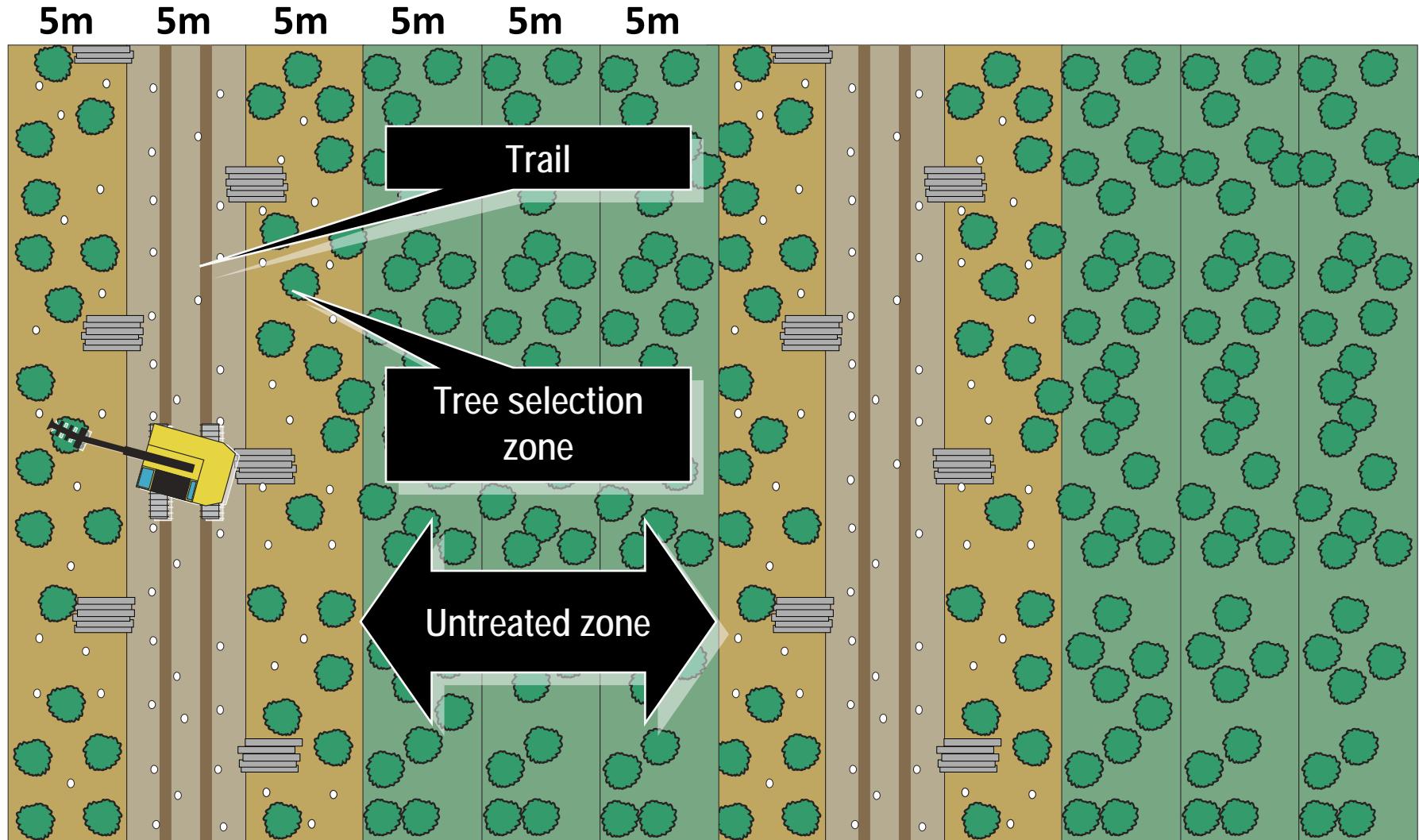
- 1-2-3 method developed by FPIinnovations
 - 1. A trail system
 - 2. Tree selection rules
 - 3. A control method

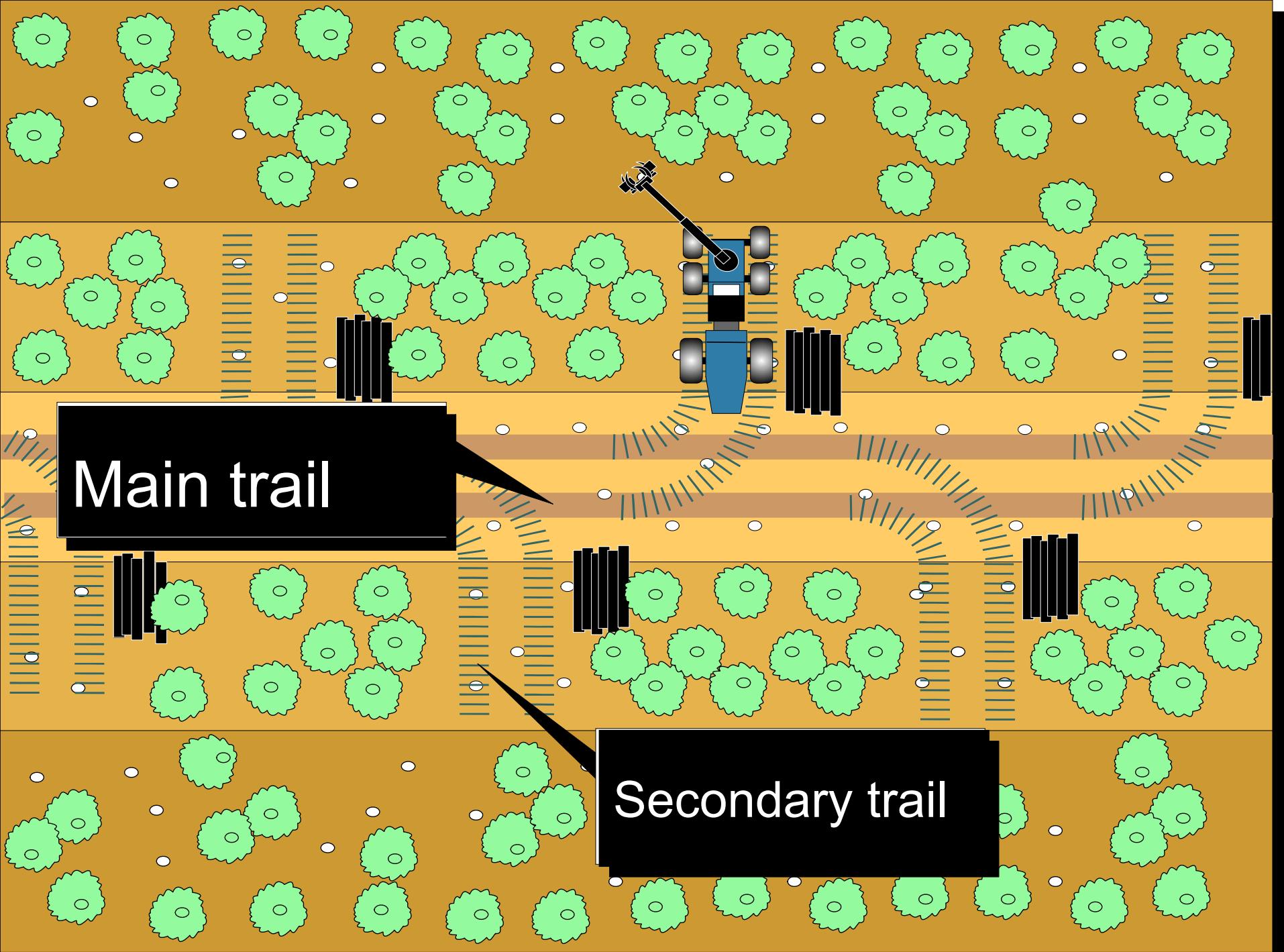
Trail spacing = 20 m

Width = 5 m



Selection cut using temporary trails





A efficient tree selection process ...



... is done by the machine operators

Tree marking for training only

Tree selection

- Operational tree classification
(from the machine cab: lower 6 m)
 - q1 : AGS, no defect
 - q2 : UGS, defect visible from 2 side only
 - q3 : UGS, defect seen from 4 side
- Removal

Tree count and priority : 1/3 smallest, $\frac{1}{4}$ least vigor, etc.
or
Spacing criteria with priority : 3 m, 4.5 m, etc.

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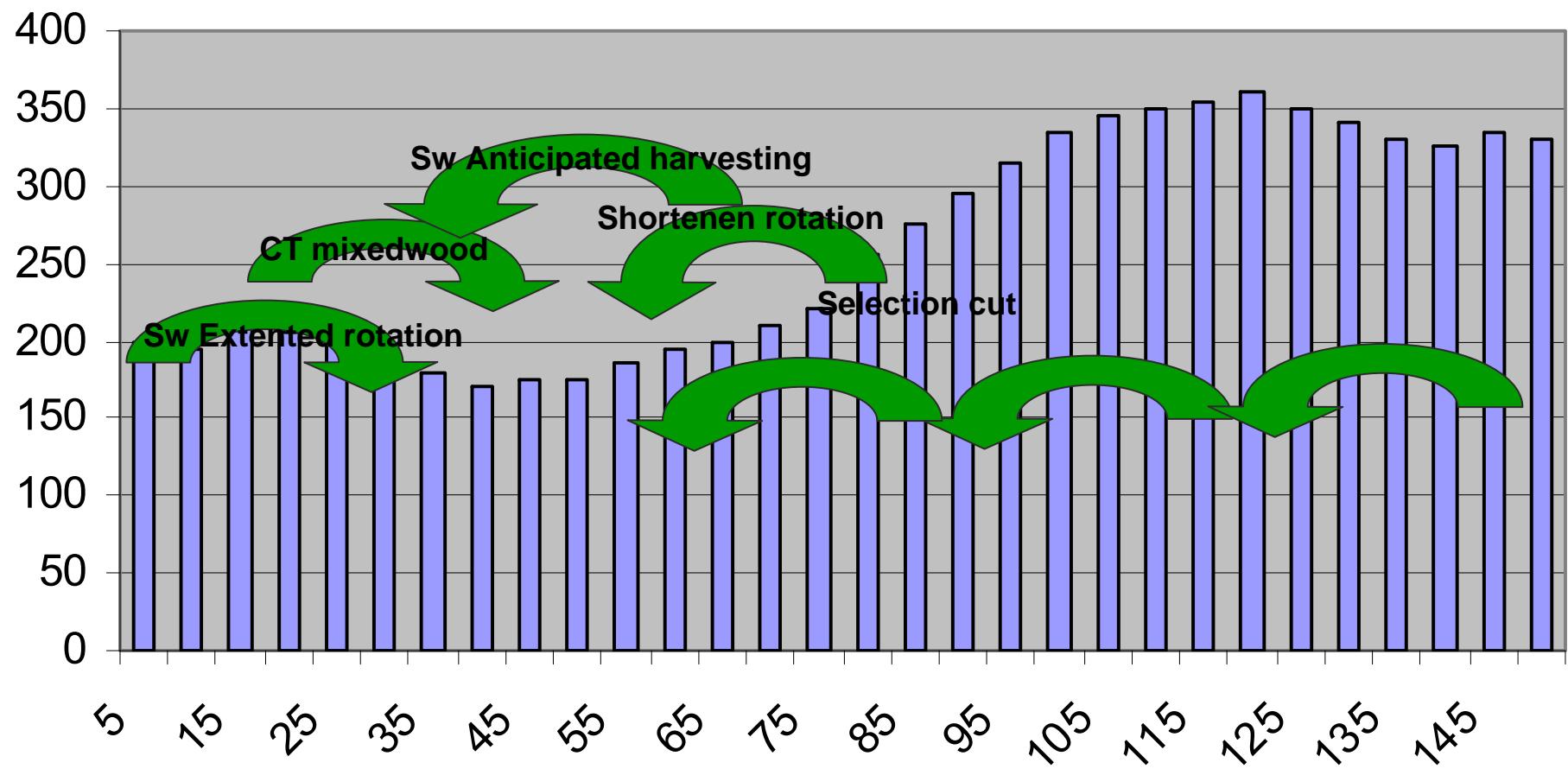
- Recommended systems :
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Site/conditions to investigate

- Guidelines
- m^3/ha
- m^3/stem

- Small natural pine
- Two-storied douglas fir / spruce
- Mid-size plantation with defective trees
- Mid-size plantation wo defectives trees
- Mature stand under constraint with short tops
- Other

A good plan suggests more than one strategy



Avantage

NON Réservé aux membres et partenaires de FERIC

Contenu

- Introduction 1
- Équipement 1
- Outils 1
- Dispositif des scieries 2
- Taux global de préparation et de ramassage des débit 3
- Dispositif expérimental 4
- Résultats 4
- Effet des tronçonneuses sur la préparation 5
- Mise en application 6
- Résumé 6

Résumé

FERIC a évalué le réseau de sentiers utilisés en éclaircie commerciale plus que les autres types et le taux de préparation pour un volume moyen. Les résultats sont comparables dans les deux types d'éclaircie. Le volume par tige est identique dans les deux types d'éclaircie.

Auteur
Philippe Mekk
Division de l'Est

Mots clés :
Éclaircie, préparation, observateur, scierie.

Introduction

La récolte d'une éclaircie commerciale dans un système de foretage nécessite plusieurs étapes. La première étape consiste à déterminer la taille et la densité des arbres à abattre. La deuxième étape consiste à préparer les arbres pour leur extraction. La troisième étape consiste à transporter les arbres vers une scierie pour leur transformation en bois de construction. La quatrième étape consiste à éliminer les déchets et les débris.

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- Résumé 4
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Résumé

FERIC a étudié l'effet de l'éclaircie commerciale sur l'abattage-fagonneuse. L'objectif était de déterminer si l'éclaircie commerciale avait un effet sur l'abattage-fagonneuse. Les résultats ont montré que l'éclaircie commerciale n'a pas d'effet sur l'abattage-fagonneuse.

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Éclaircie de No

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Division de l'Est

Introduction

Dans le cadre du programme d'études sur l'abattage-fagonneuse, une étude a été réalisée dans deux sites d'éclaircie. Un premier essai a été effectué en novembre 1999 près de Carleton-sur-Mauricie (Québec) en février 2000 et un deuxième essai à St-Ludger.

Figure 1. L'abattage-fagonneuse Samsung 130LCMII avec flèche DT et tête Pan 62B.

Effet de la préparation commerciale d'une abattage-fagonneuse

Résumé

FERIC a étudié l'effet de la préparation commerciale sur l'abattage-fagonneuse. L'objectif était de déterminer si la préparation commerciale avait un effet sur l'abattage-fagonneuse. Les résultats ont montré que la préparation commerciale n'a pas d'effet sur l'abattage-fagonneuse.

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Guide du gestionnaire de projets d'éclaircie commerciale en forêt publique au Québec

Philippe Mekk



Questions ?

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