Forestry Field Handbook

Revised 1993

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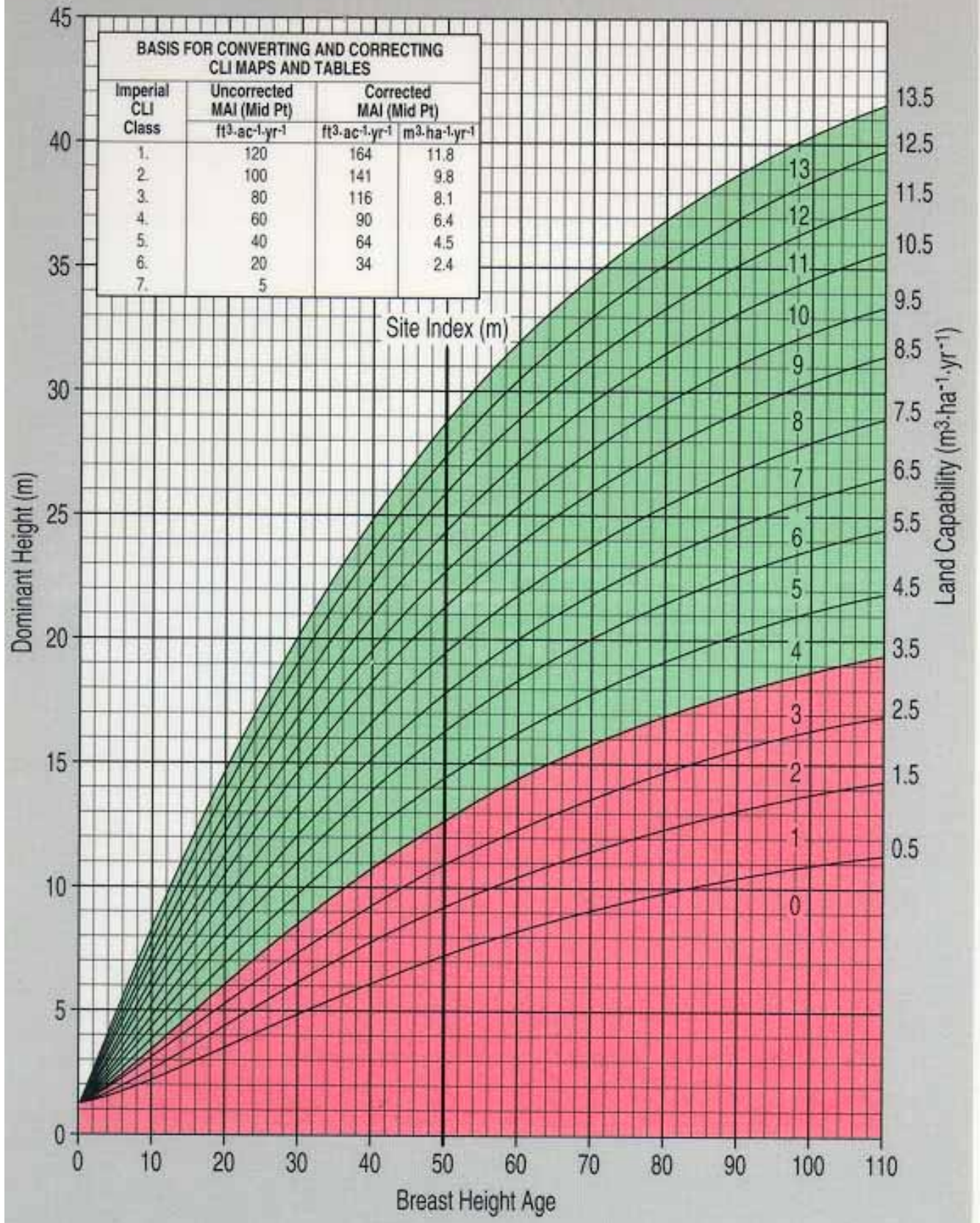
Land Capability for Nova Scotia Softwoods

Based on Breast Height Age

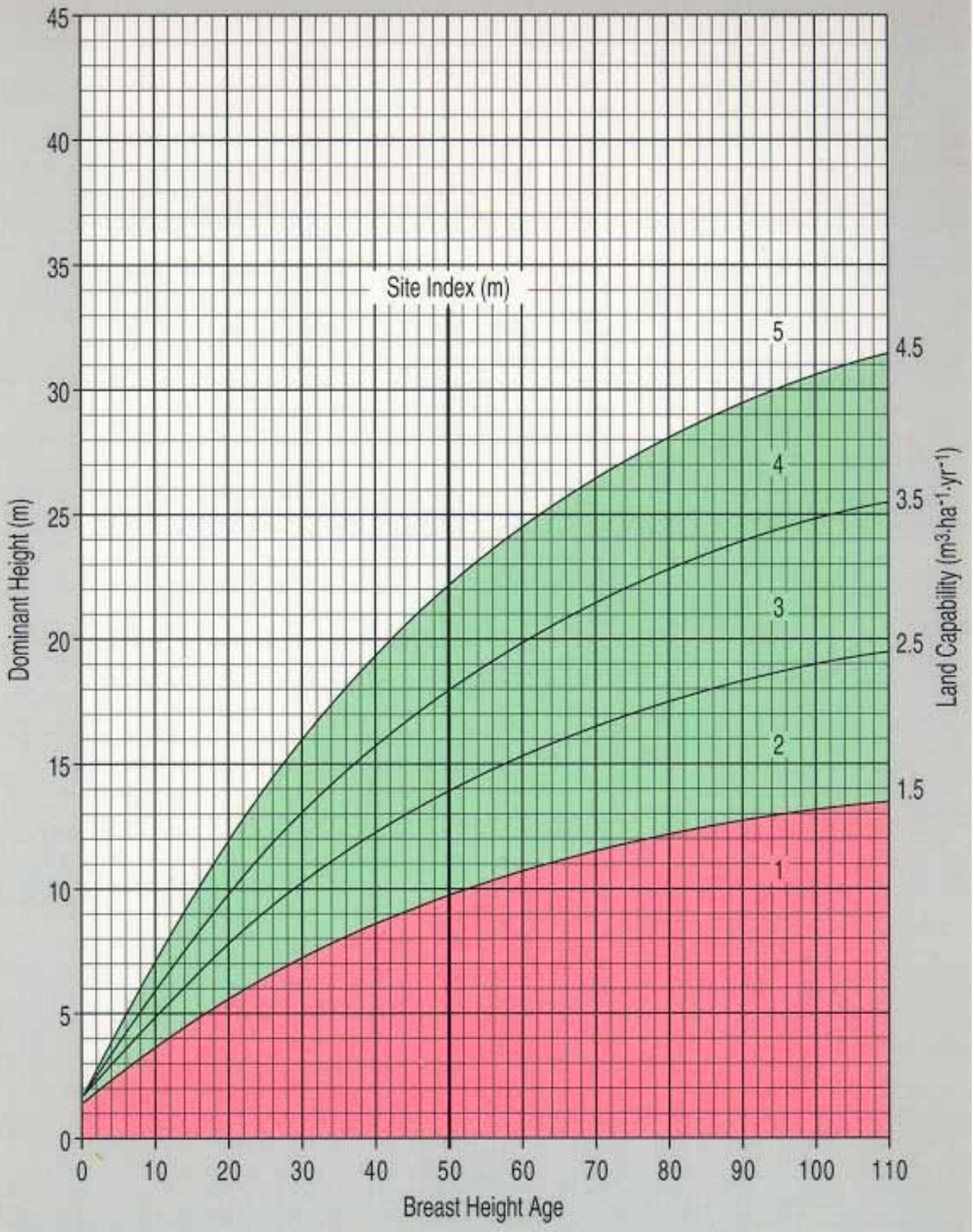


BASIS FOR CONVERTING AND CORRECTING CLI MAPS AND TABLES

Imperial CLI Class	Uncorrected MAI (Mid Pt)	Corrected MAI (Mid Pt)	
	$ft^3 \cdot ac^{-1} \cdot yr^{-1}$	$ft^3 \cdot ac^{-1} \cdot yr^{-1}$	$m^3 \cdot ha^{-1} \cdot yr^{-1}$
1.	120	164	11.8
2.	100	141	9.8
3.	80	116	8.1
4.	60	90	6.4
5.	40	64	4.5
6.	20	34	2.4
7.	5		

Land Capability for Nova Scotia Hardwoods

Based on Breast Height Age



Identification of Site Factors

Drainage

1) Excessively Drained
Thin LFH
Very Bright Colours
No Mottling
Coarse Sand Texture

2) Well Drained
Thin LFH
Bright Colours
No Mottling
Variable Texture

3) Imperfectly Drained
Moderately Deep LFH
Dull Colours
Mottling "B" Horizon
Sphagnum in Hollows

4) Poorly Drained
Deep LFH
White Soil
Mottling "A" and "B"
Sphagnum Common

Stoniness

1) Stonefree
No Interference to Mechanical Equipment

2) Moderate
Moderate to severe Interference to Mechanical Equipment

3) Severe
Prevents the Use of Mechanical Equipment

Fertility

1) Low Fertility
Granite
Rhyolite
Gneiss

2) Medium Fertility
Sandstone
Basalt
Conglomerate
Quartzite
Schist

3) High Fertility
Shales or a Mixture of Rock Types, One of Which is Shale or Slate

Exposure

1) Exposed
Along Coast Lines, Upper Slopes, Open to Winds from Two Directions or More

2) Moderate Exposure
Broad Flats, Lower and Middle Slopes of Strong Ridges, Upper Slope or Gentle Relief

3) Sheltered
Lower slopes of Deep Valleys where Protection is Provided on all Sides

Vegetation

1) Ericaceous
Kalmia
Blueberry
Huckleberry, etc.

2.) Non-Ericaceous
Bunchberry
Golden Rod
Wood Sorrel
Raspberry
Grass
Moss
Etc

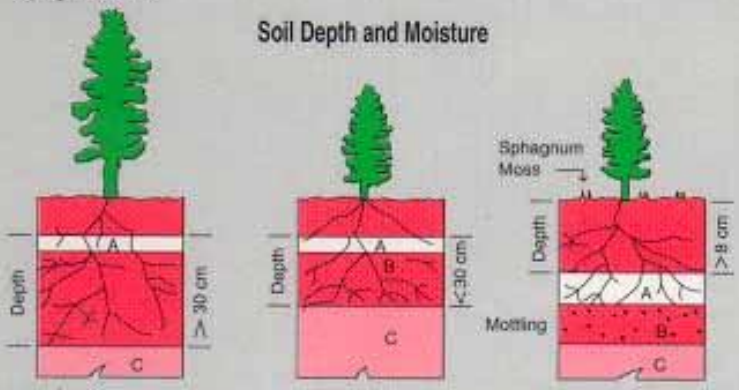
Rock Type

1) Igneous
Igneous Rocks are Produced by Cooling and Crystalization of Molten Rock Called Lava ex. Granite, Basalt

2) Sedimentary
Sedimentary Rocks are Produced by Weathering and Erosion of Other Rocks, ex. Shale, Sandstone

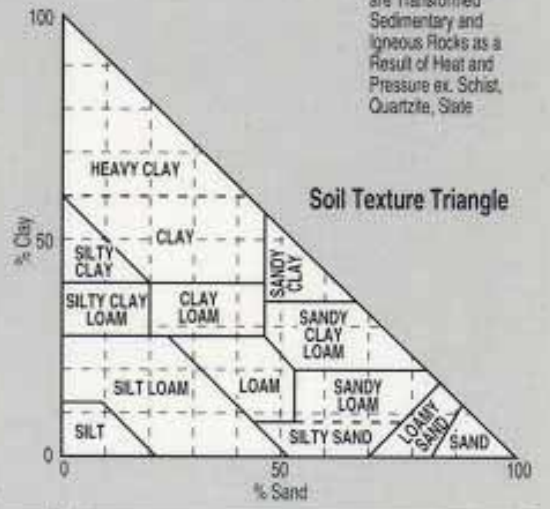
3) Metamorphic
Metamorphic Rocks are Transformed Sedimentary and Igneous Rocks as a Result of Heat and Pressure ex. Schist, Quartzite, Slate

Soil Depth and Moisture



Deep, Well Drained Soil — Shallow Soil — Imperfectly Drained Soil

Soil Texture Triangle



SOIL TEXTURE ASSESSMENT GUIDE*

START: MOIST CAST TEST	RIBBON TEST	FEEL TEST	SHINE TEST	TEXTURE
NO CAST	NONE	VERY GRAINY	NO SHINE	SAND (S)
VERY WEAK CAST	NONE	VERY GRAINY	NO SHINE	LOAMY SAND (LS)
WEAK CAST	BARELY RIBBONS	GRAINY	NO SHINE	SANDY LOAM (SL)
WEAK CAST	FLAKES	VERY SLIPPERY SLIGHTLY GRAINY & STICKY	NO SHINE	SILT LOAM (SIL)
MODERATE CAST	THICK & SHORT (< 1 CM)	SLIGHTLY GRAINY STICKY & SLIPPERY	NO SHINE	LOAM (L)
STRONG CAST	THICK & SHORT (< 1 CM)	GRAINY SLIGHTLY STICKY	SLIGHT SHINE	SANDY CLAY LOAM (SCL)
STRONG CAST	THIN, BARELY SUPPORTS OWN WEIGHT	STICKY	SLIGHT SHINE	CLAY LOAM (CL)
VERY STRONG CAST	THIN, LONG (5-7 CM) HOLDS OWN WEIGHT	SMOOTH, VERY STICKY	MODERATE SHINE	CLAY (C)
VERY STRONG CAST	VERY THIN, VERY LONG (>7 CM)	SMOOTH, VERY STICKY	VERY SHINY	CLAY (C)

SOIL TEXTURE ASSESSMENT TESTS*

MOIST CAST TEST - Compress some moist soil by clenching it in your hand; if the soil holds together (i.e. forms a cast), then test the strength of the cast by tossing it from hand to hand. The more durable it is, the more clay is present.

RIBBON TEST - Moist soil is rolled into cigarette shape and then squeezed out between the thumb and forefinger to form the longest and thinnest ribbon possible.

FEEL TESTS

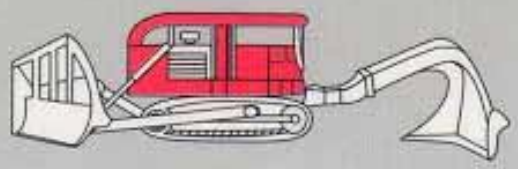
GRAININESS TEST - Soil is rubbed between thumb and fingers to assess the % sand. Sand feels grainy.

STICKINESS TEST - Soil is wetted and compressed between the thumb and forefinger. Degree of stickiness is determined by noting how strongly it adheres to the thumb and forefinger upon release of pressure and how much it stretches.

SHINE TEST - A small amount of moderately dry soil is rolled into a ball and rubbed once or twice against a hard, smooth object such as a knife blade or thumbnail. A shine on the ball indicates clay in the soil.

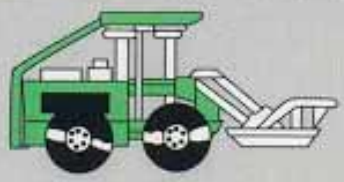
*Modified from The Canada Soil Information System (CanSIS) 1982.

Site Preparation Equipment Guide

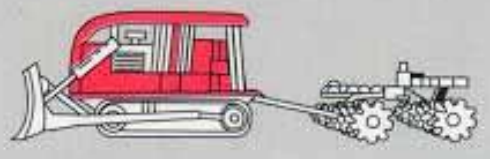


FINNISH PLOW	
Production	- 0.4 - 0.5 ha/hr
Prime Mover	- Crawler Tractor
H.P. Required	- 180 Plus
Weight	- 3200 kg
Length	- 5.4m
Width	- 2.55m

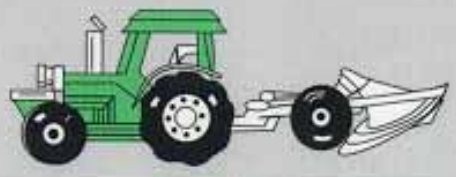
SHARKFIN BARRELS OR ANCHOR CHAINS	
Production	- 0.5 - 1.5 ha/hr
Prime Mover	- Skidder
H.P. Required	- 100 - 150
Weight of Barrel	- 410 kg Empty, 780 kg Full
Length of Barrel	- 0.8 - 1.6m
Diameter of Barrel	- 0.3 - 0.6m
Weight of Chains	- 200 kg per 2.5m length
Length of Chains	- 3.0 - 7.0m
Width of Chains	- 0.5m



HYDRO AXE	
Production	- 0.4 - 0.8 ha/hr
Prime Mover	- Hydro Mower PM-800
H.P. Required	- 125 - 180
Weight	- 7000 - 11000 kg
Length	- 5.5 - 7.6m
Width	- 2.4 - 2.7m



DISK	
Production	- 0.4 ha/hr
Prime Mover	- Dozer
H.P. Required	- 210 Plus
Weight	- 11 Tonnes
Length	- 4.6m
Width	- 3.6m



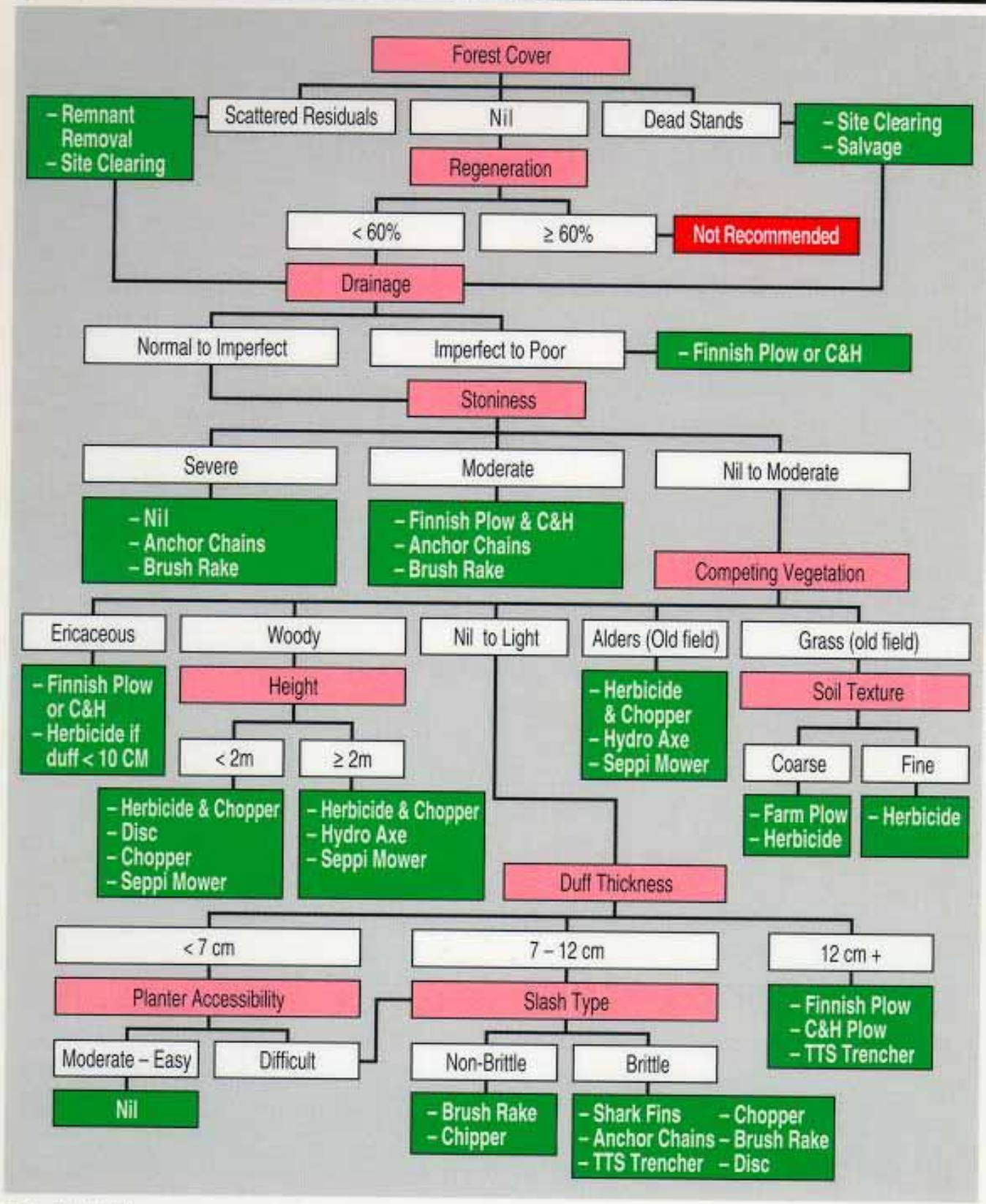
SINGLE FURROW PLOW	
Production	- 0.4 - 0.6 ha/hr
Prime Mover	- Farm Tractor
H.P. Required	- 35 Plus
Weight	- 100 kg
Length	- 1.0m
Width	- 0.5m

TTS TRENCHER	
Production	- 0.4 - 0.5 ha/hr
Prime Mover	- Skidder
H.P. Required	- 100 - 180
Weight	- 2040 kg
Length	- 2.1m
Width	- 3:6m

CHOPPER	
Production	- 0.4 - 1.2 ha/hr
Prime Mover	- Skidder
H.P. Required	- 125 Plus
Weight	- 11t empty, 15t full of water
Length	- 5.5m
Width of Drum	- 2.1m

BRUSH RAKE	
Production	- 0.4 - 1.0 ha/hr
Prime Mover	- Skidder
H.P. Required	- 100 - 150
Weight	- 830 kg
Length	- 0.5m
Width	- 2.0 - 3.0m

Site Preparation Key



Note: Finnish Plow not recommended if browsing hazard is high.
Where site is rocky or difficult to plant or site prepare, see Shelterwood/Seed Tree Key.
Equipment and/or methods within blocks are ranked in descending order of priority.
Where hylobius hazard is high, delay site preparation at least one year from date of harvest.

Species / Site Selection Planting Key

Planting Season

- **Spring** — Delay planting Larches until after last frost
- **Fall** — rS not recommended after 1 August

Porcupine Hazard

- **Moderate – High** — WS or BS only
- **Low – Nil** → **Hylobius Hazard**

Hylobius Hazard

- **Moderate – High** — Swd – Mwd Cut → **Age of Cutover**
- **Low – Nil** — Hwd Cut → **Eco Climate**

Age of Cutover

- **1 to 2 Years** — Planting not recommended
- **3 Years +** → **Eco Climate**

Eco Climate

- **Exposed** — RS is not recommended
- **Coastal** — RP is not recommended
- **Other**
- **Frost Pocket** — NS* is not recommended

* Delay planting of other species until after last frost.

Region

- **C. B. H. **** — RS, WP, RP, JP, EL not recommended
- **All Other**

** Unique Eco-climate – only special provenances of WS, BS recommended.

Vegetation Competition

- **Ericaceous** — Spruces not recommended
- **Non-Ericaceous**
  - **Low – Nil or Controlled**
  - **Mod – Severe** — Refer to Site Preparation Key

Browsing Hazard

- **Mod – Severe** — Planting not recommended
- **Nil – Light**

Drainage

- **Excessive** — RP - 5 †† JP - 5 WP - 5
- **Well Drained** → **Fertility †**
- **Imperfect** — BS - 6 †† RS - 6 NS - 9 EL - 6 WS - 6
- **Poor** — Not recommended unless drained

Fertility †

Low	Medium	High
Species ††	Species ††	Species ††

Species ††	Low	Medium	High
Spruces	NS - 9 RS - 6 WS - 6 BS - 6	NS - 11 RS - 8 WS - 8 BS - 8	NS - 12 RS - 9 WS - 9 BS - 9
Pines	RP - 7 WP - 7 JP - 6	RP - 9 WP - 9 JP - 7	RP - 11 WP - 10 JP - 8
Larches	JL - 10 EL - 6	JL - 12 EL - 7	JL - 14 EL - 8

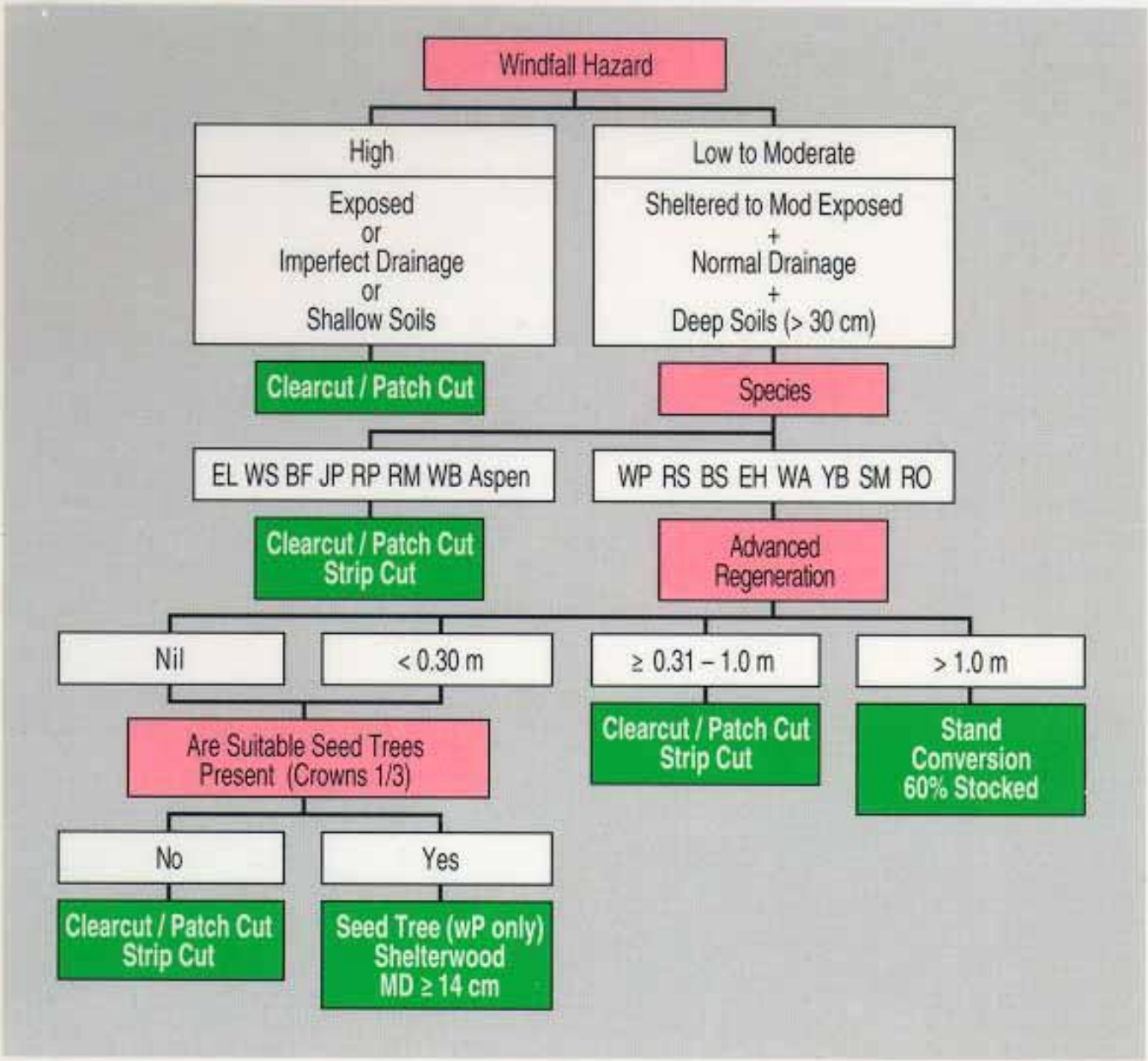
† Fertility is defined on basis of rock type (See identification of Site Factors Key).

†† The expected gross merchantable mean annual increment ($m^3 \cdot ha^{-1} \cdot yr^{-1}$) is indicated for each species. For plantations established on sites with severe root competition (ericaceous vegetation or grass), expected productivity will be 1 to 3 $m^3 \cdot ha^{-1} \cdot yr$ less.

Note: Ericaceous sites revert to non-ericaceous with adequate site preparation.

RS = RED SPRUCE	WP = WHITE PINE
BS = BLACK SPRUCE	JP = JACK PINE
WS = WHITE SPRUCE	JL = JAPANESE LARCH
NS = NORWAY SPRUCE	EL = EASTERN LARCH
RP = RED PINE	

Regeneration Harvest Methods Key



Harvest Restrictions Key

A. Watercourses*

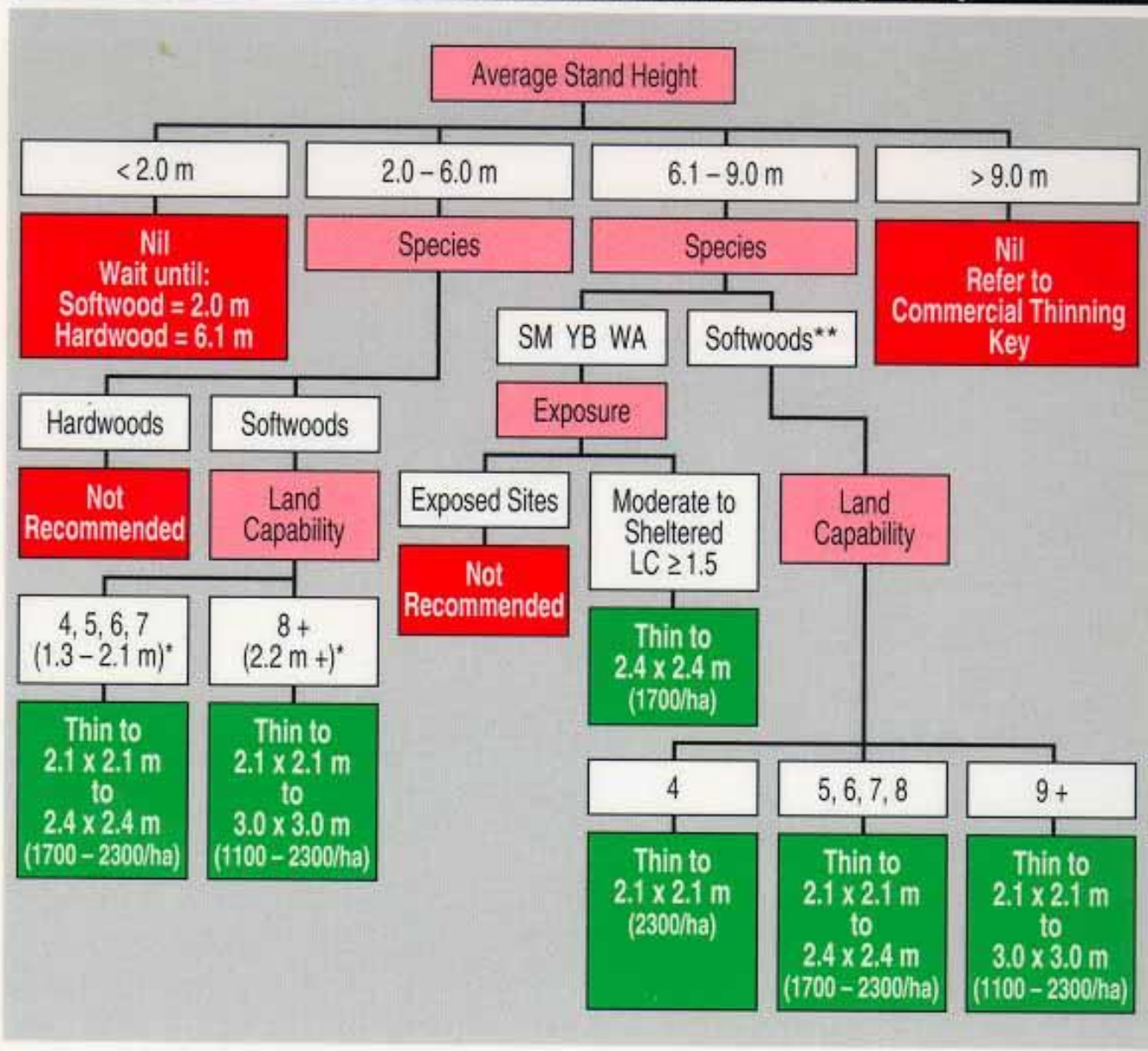
1a Identifiable on 1:50,000 topographic map. 2
b Not present on 1:50,000 topographic map. 3
2 Minimum 20 m greenbelt required
3 Minimum 5 m machine exclusion zone required.

* For further details refer to the Forest / Wildlife Guidelines and Standards for Nova Scotia.

B. Harvest Size*

1a Cutover area < 50 ha 2
b Cutover area ≥ 50 ha 5
2a No adjacent cutovers 6
b Adjacent cutovers present 3
3a Regeneration < 2m 4
b Regeneration ≥ 2m 6
4a Cutover area + adjacent cutover > 50 ha 5
b Cutover area + adjacent cutover ≤ 50 ha 6
5 Wildlife corridors minimum width 50 m required
6 No wildlife corridors required

Pre-Commercial Thinning Key (PCT)



* Average 5 year height growth on 5 tallest saplings beginning at the 1st whorl above breast height.

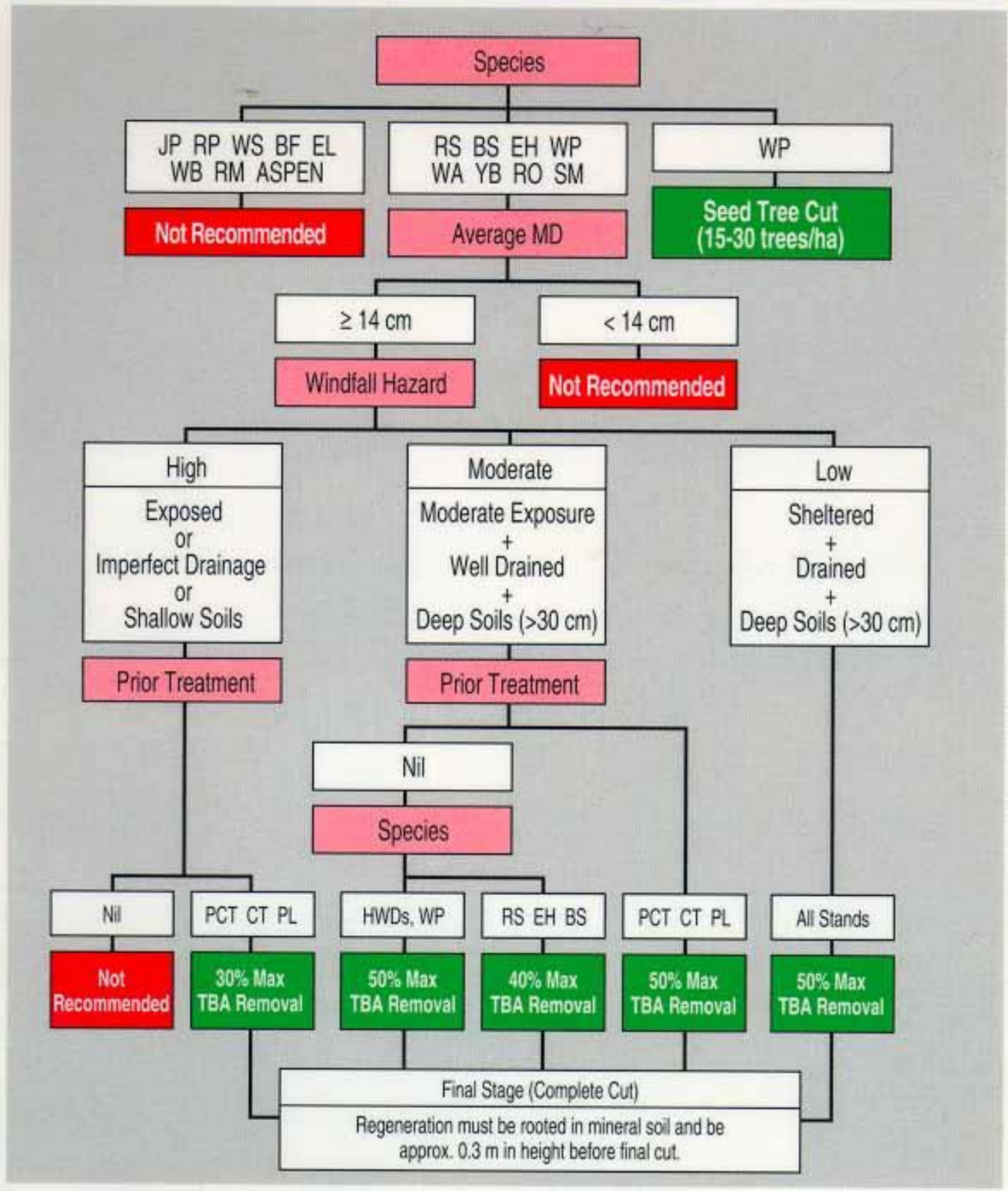
** Pre-commercial thinning is not recommended in stands where there are more than 23,000 stems/ha.

Note: The softwood component of mixedwood stands must be at least 4 m in height, if a herbicide is not applied.

Softwood crop trees must have a live crown to stem ratio of at least one third.

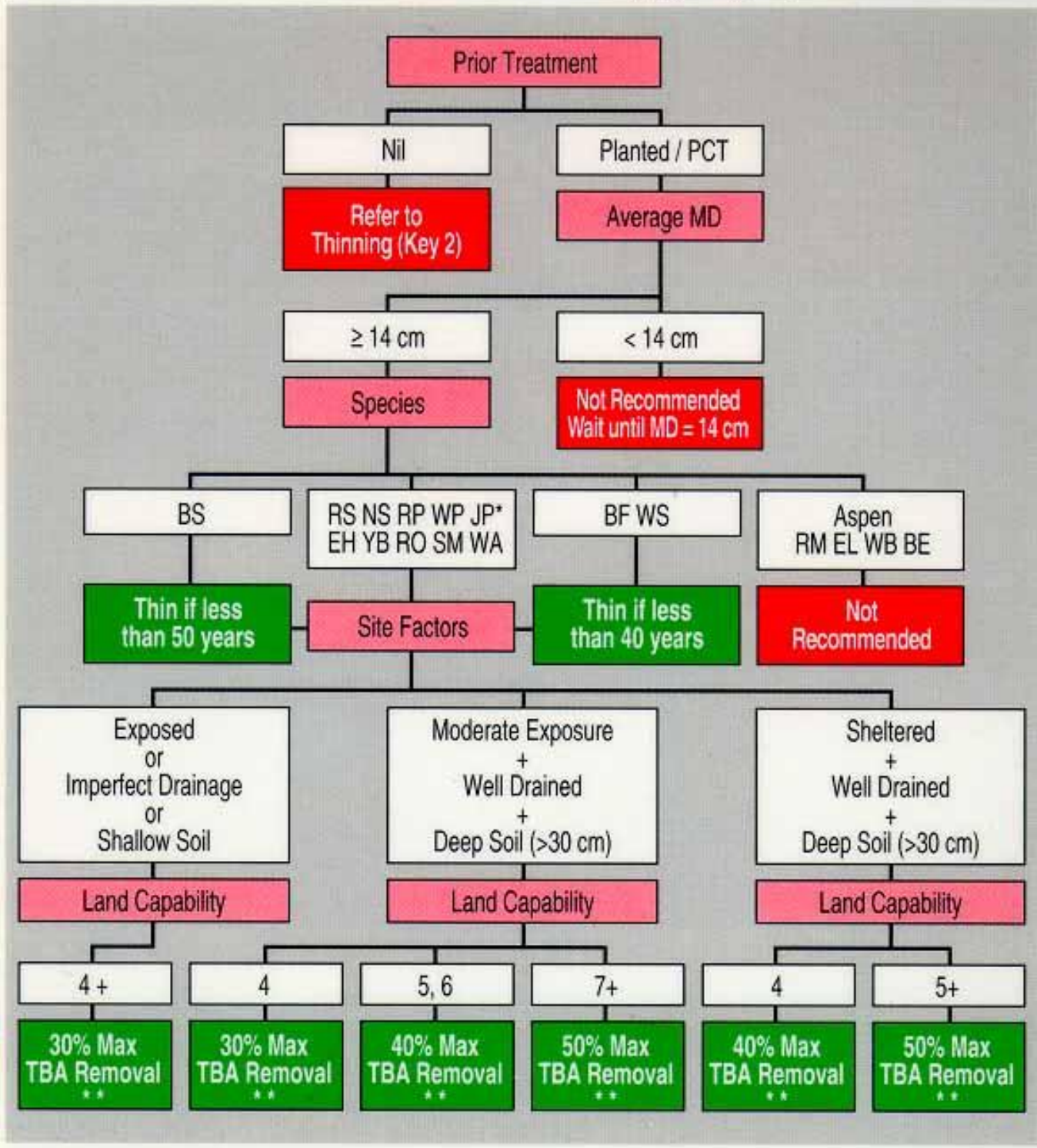
BF =	BALSAM FIR	RM =	RED MAPLE
BE =	BEECH	RO =	RED OAK
BS =	BLACK SPRUCE	RP =	RED PINE
CT =	COMMERCIAL THINNING	RS =	RED SPRUCE
EH =	EASTERN HEMLOCK	SM =	SUGAR MAPLE
EL =	EASTERN LARCH	TBA =	TOTAL BASAL AREA
HWD =	HARDWOOD	WA =	WHITE ASH
JP =	JACK PINE	WB =	WHITE BIRCH
MD =	MERCHANTABLE DIAMETER	WP =	WHITE PINE
PT =	PLANTATION	WS =	WHITE SPRUCE
PCT =	PRE-COMMERCIAL THINNING	YB =	YELLOW BIRCH

Shelterwood – Seed Tree Key



Note: A second stage shelterwood may be required to reduce the TBA another 30% if after 5 years regeneration is not adequately established.

Commercial Thinning (Key 1)

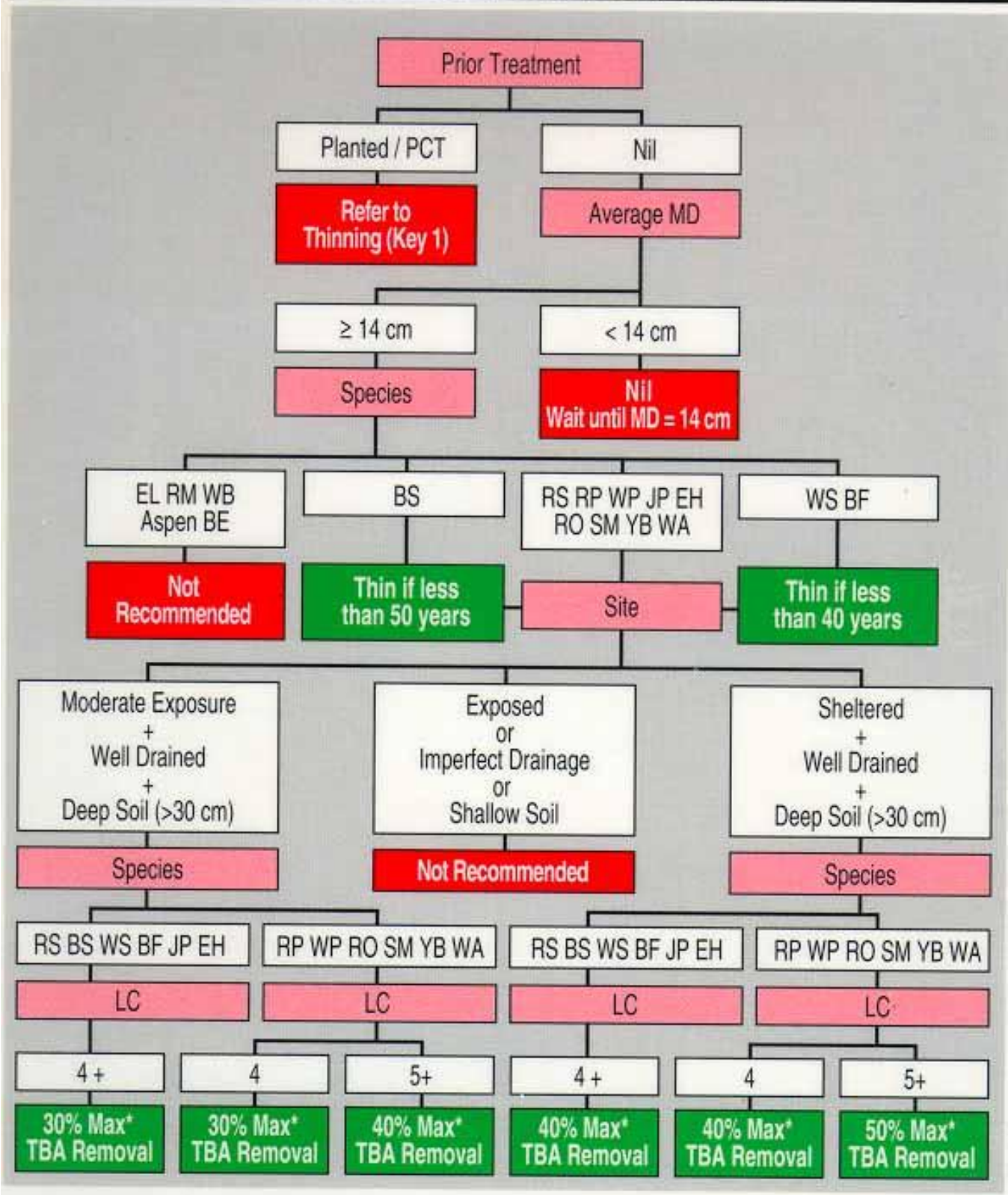


* The risk of blowdown in planted/thinned jack pine stands is high.

** Excludes the basal area of trees removed in parallel extraction trails. See Commercial Thinning Guides for additional information. Thin (from below) only healthy and vigourous stands. Refer to page 35 for approximate spacing between leave trees.

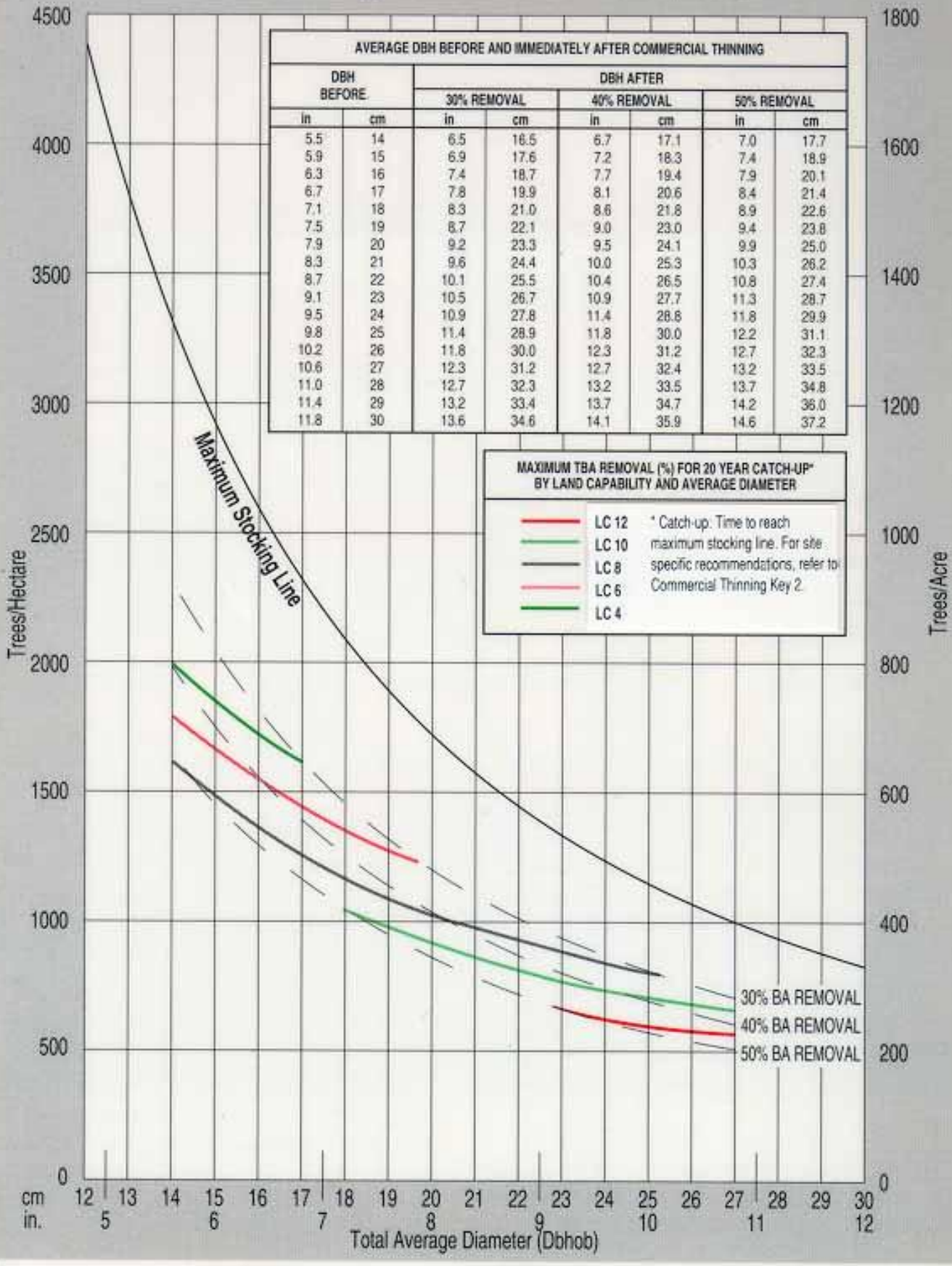
BF =	BALSAM FIR	RM =	RED MAPLE
BE =	BEECH	RO =	RED OAK
BS =	BLACK SPRUCE	RP =	RED PINE
CT =	COMMERCIAL THINNING	RS =	RED SPRUCE
EH =	EASTERN HEMLOCK	SM =	SUGAR MAPLE
EL =	EASTERN LARCH	TBA =	TOTAL BASAL AREA
HWD =	HARDWOOD	WA =	WHITE ASH
JP =	JACK PINE	WB =	WHITE BIRCH
MD =	MERCHANTABLE DIAMETER	WP =	WHITE PINE
PT =	PLANTATION	WS =	WHITE SPRUCE
PCT =	PRE-COMMERCIAL THINNING	YB =	YELLOW BIRCH

Commercial Thinning (Key 2)



* Excludes the basal area of trees removed in parallel extraction trails.
Refer to page 35 for approximate spacing between leave trees.
Thin (from below) only healthy and vigourous stands.

Unmanaged Softwood Stands



AVERAGE DBH BEFORE AND IMMEDIATELY AFTER COMMERCIAL THINNING

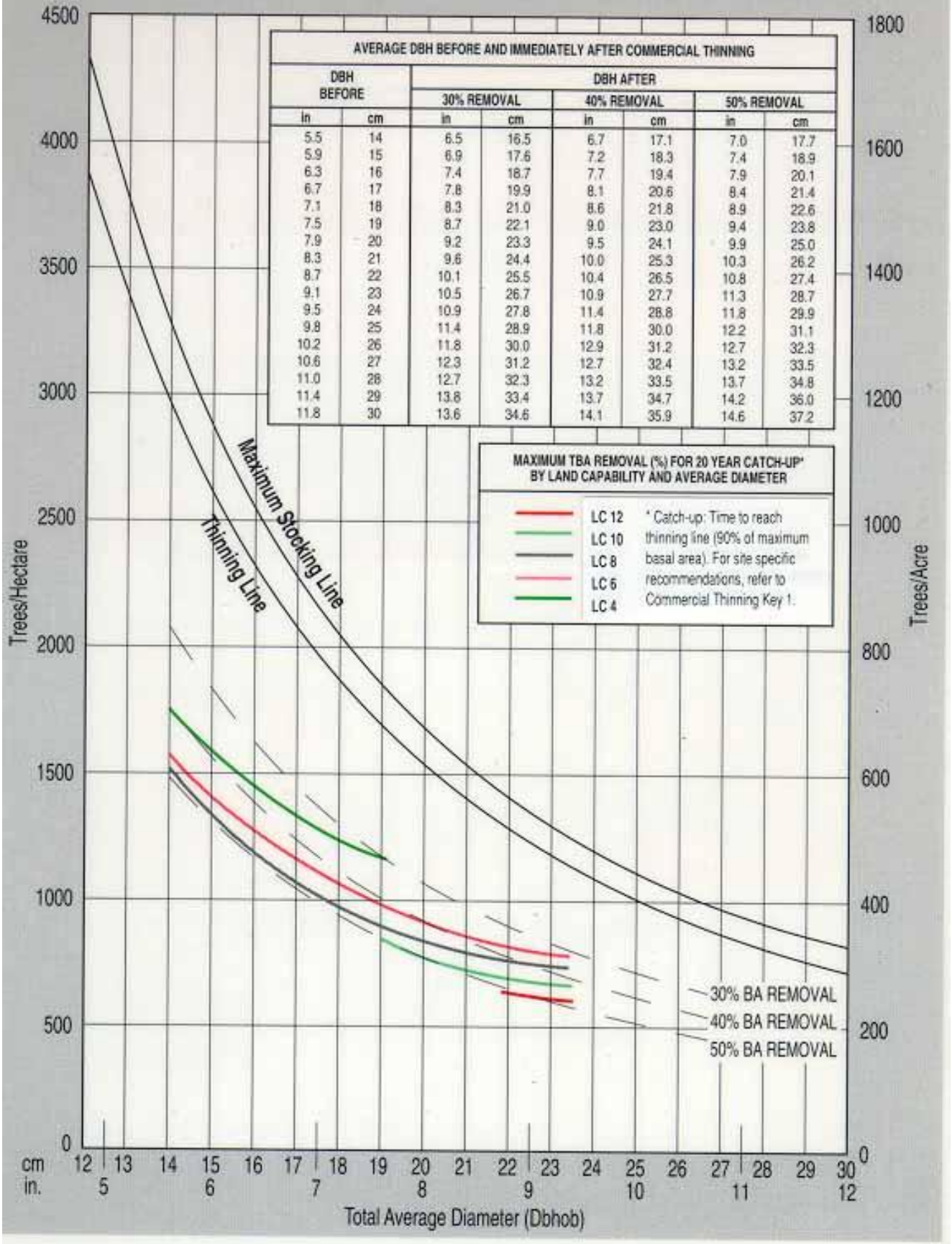
DBH BEFORE		DBH AFTER					
		30% REMOVAL		40% REMOVAL		50% REMOVAL	
in	cm	in	cm	in	cm	in	cm
5.5	14	6.5	16.5	6.7	17.1	7.0	17.7
5.9	15	6.9	17.6	7.2	18.3	7.4	18.9
6.3	16	7.4	18.7	7.7	19.4	7.9	20.1
6.7	17	7.8	19.9	8.1	20.6	8.4	21.4
7.1	18	8.3	21.0	8.6	21.8	8.9	22.6
7.5	19	8.7	22.1	9.0	23.0	9.4	23.8
7.9	20	9.2	23.3	9.5	24.1	9.9	25.0
8.3	21	9.6	24.4	10.0	25.3	10.3	26.2
8.7	22	10.1	25.5	10.4	26.5	10.8	27.4
9.1	23	10.5	26.7	10.9	27.7	11.3	28.7
9.5	24	10.9	27.8	11.4	28.8	11.8	29.9
9.8	25	11.4	28.9	11.8	30.0	12.2	31.1
10.2	26	11.8	30.0	12.3	31.2	12.7	32.3
10.6	27	12.3	31.2	12.7	32.4	13.2	33.5
11.0	28	12.7	32.3	13.2	33.5	13.7	34.8
11.4	29	13.2	33.4	13.7	34.7	14.2	36.0
11.8	30	13.6	34.6	14.1	35.9	14.6	37.2

MAXIMUM TBA REMOVAL (%) FOR 20 YEAR CATCH-UP* BY LAND CAPABILITY AND AVERAGE DIAMETER

LC 12
LC 10
LC 8
LC 6
LC 4

* Catch-up: Time to reach maximum stocking line. For site specific recommendations, refer to Commercial Thinning Key 2.

Pre-Commercially Thinned Softwood Stands



AVERAGE DBH BEFORE AND IMMEDIATELY AFTER COMMERCIAL THINNING

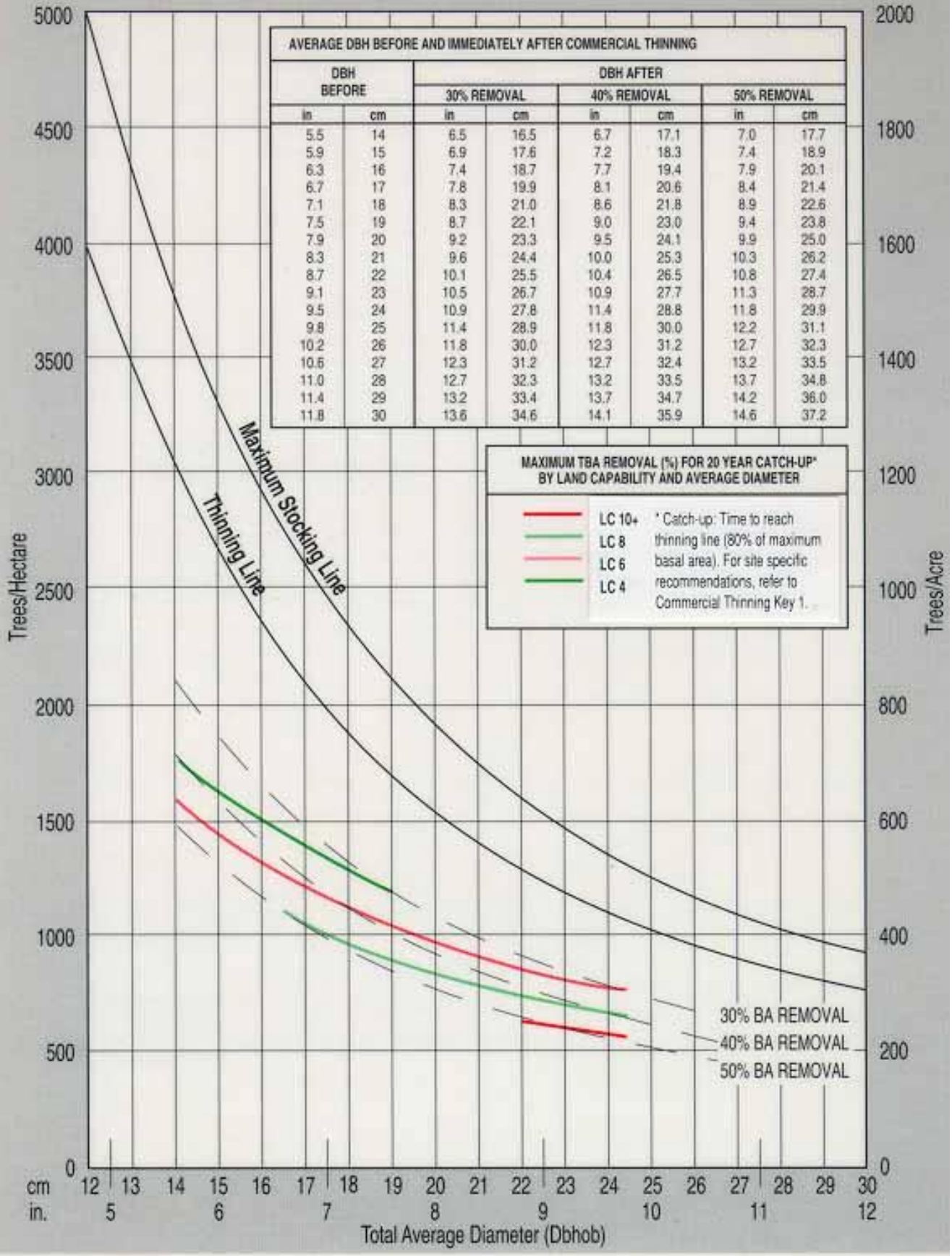
DBH BEFORE		DBH AFTER					
		30% REMOVAL		40% REMOVAL		50% REMOVAL	
in	cm	in	cm	in	cm	in	cm
5.5	14	6.5	16.5	6.7	17.1	7.0	17.7
5.9	15	6.9	17.6	7.2	18.3	7.4	18.9
6.3	16	7.4	18.7	7.7	19.4	7.9	20.1
6.7	17	7.8	19.9	8.1	20.6	8.4	21.4
7.1	18	8.3	21.0	8.6	21.8	8.9	22.6
7.5	19	8.7	22.1	9.0	23.0	9.4	23.8
7.9	20	9.2	23.3	9.5	24.1	9.9	25.0
8.3	21	9.6	24.4	10.0	25.3	10.3	26.2
8.7	22	10.1	25.5	10.4	26.5	10.8	27.4
9.1	23	10.5	26.7	10.9	27.7	11.3	28.7
9.5	24	10.9	27.8	11.4	28.8	11.8	29.9
9.8	25	11.4	28.9	11.8	30.0	12.2	31.1
10.2	26	11.8	30.0	12.9	31.2	12.7	32.3
10.6	27	12.3	31.2	12.7	32.4	13.2	33.5
11.0	28	12.7	32.3	13.2	33.5	13.7	34.8
11.4	29	13.8	33.4	13.7	34.7	14.2	36.0
11.8	30	13.6	34.6	14.1	35.9	14.6	37.2

MAXIMUM TBA REMOVAL (%) FOR 20 YEAR CATCH-UP* BY LAND CAPABILITY AND AVERAGE DIAMETER

LC 12
LC 10
LC 8
LC 6
LC 4

* Catch-up: Time to reach thinning line (90% of maximum basal area). For site specific recommendations, refer to Commercial Thinning Key 1.

Softwood Plantations

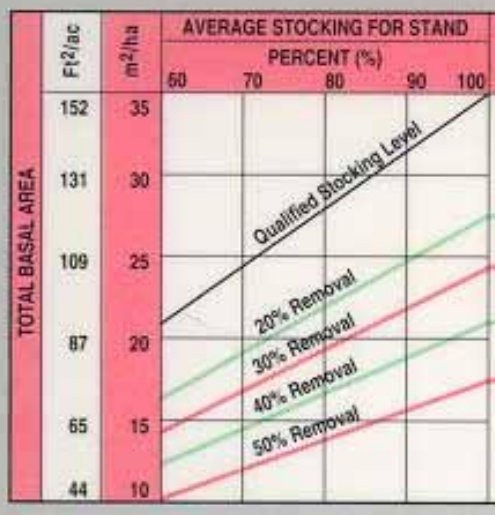


AVERAGE DBH BEFORE AND IMMEDIATELY AFTER COMMERCIAL THINNING

DBH BEFORE		DBH AFTER					
		30% REMOVAL		40% REMOVAL		50% REMOVAL	
in	cm	in	cm	in	cm	in	cm
5.5	14	6.5	16.5	6.7	17.1	7.0	17.7
5.9	15	6.9	17.6	7.2	18.3	7.4	18.9
6.3	16	7.4	18.7	7.7	19.4	7.9	20.1
6.7	17	7.8	19.9	8.1	20.6	8.4	21.4
7.1	18	8.3	21.0	8.6	21.8	8.9	22.6
7.5	19	8.7	22.1	9.0	23.0	9.4	23.8
7.9	20	9.2	23.3	9.5	24.1	9.9	25.0
8.3	21	9.6	24.4	10.0	25.3	10.3	26.2
8.7	22	10.1	25.5	10.4	26.5	10.8	27.4
9.1	23	10.5	26.7	10.9	27.7	11.3	28.7
9.5	24	10.9	27.8	11.4	28.8	11.8	29.9
9.8	25	11.4	28.9	11.8	30.0	12.2	31.1
10.2	26	11.8	30.0	12.3	31.2	12.7	32.3
10.6	27	12.3	31.2	12.7	32.4	13.2	33.5
11.0	28	12.7	32.3	13.2	33.5	13.7	34.8
11.4	29	13.2	33.4	13.7	34.7	14.2	36.0
11.8	30	13.6	34.6	14.1	35.9	14.6	37.2

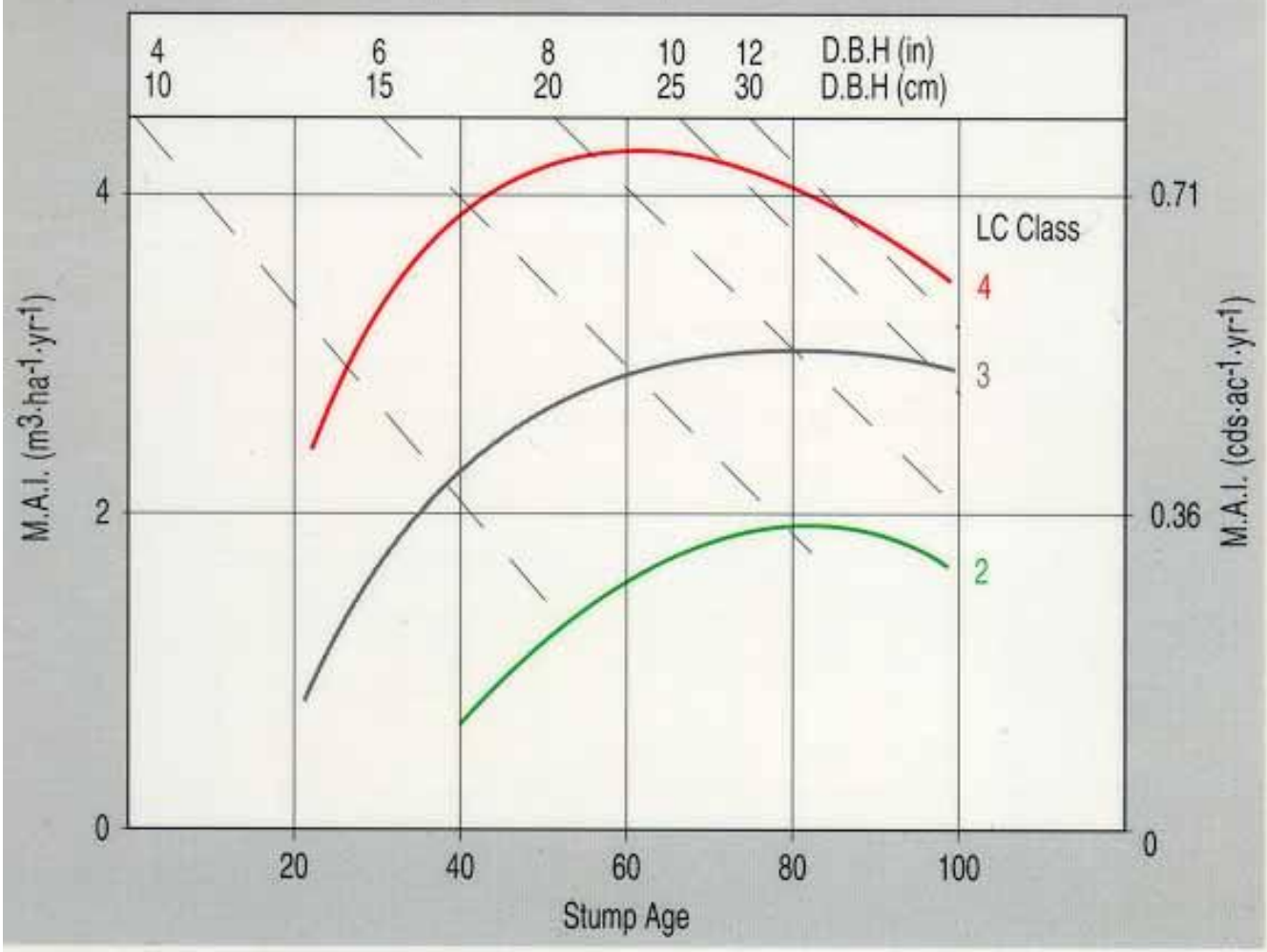
MAXIMUM TBA REMOVAL (%) FOR 20 YEAR CATCH-UP* BY LAND CAPABILITY AND AVERAGE DIAMETER

Commercial Thinning Guide for Hardwoods



PERCENT BASAL AREA REMOVED	LC CLASS 2	LC CLASS 3	LC CLASS 4	AVERAGE TOTAL D.B.H. PRIOR TO THINNING 6	7	8	9	10	in
				15	18	20	23	25	cm
	YEARS TO CATCH-UP			AVERAGE TOTAL D.B.H. AT CATCH-UP TIME					
20	15	10	5	7.5 19	8.5 21	9.5 24	10.5 27	11.5 29	in cm
30	20	15	10	8.5 22	9.5 24	10.5 27	11.5 29	12.5 32	in cm
40	25	20	15	9.5 24	10.5 27	11.5 29	12.5 32	13.5 34	in cm
50	30	25	20	10.5 27	11.5 29	12.5 32	14.0 36	15.0 38	in cm

Provisional Growth Projections for Fully Stocked Hardwood Stands



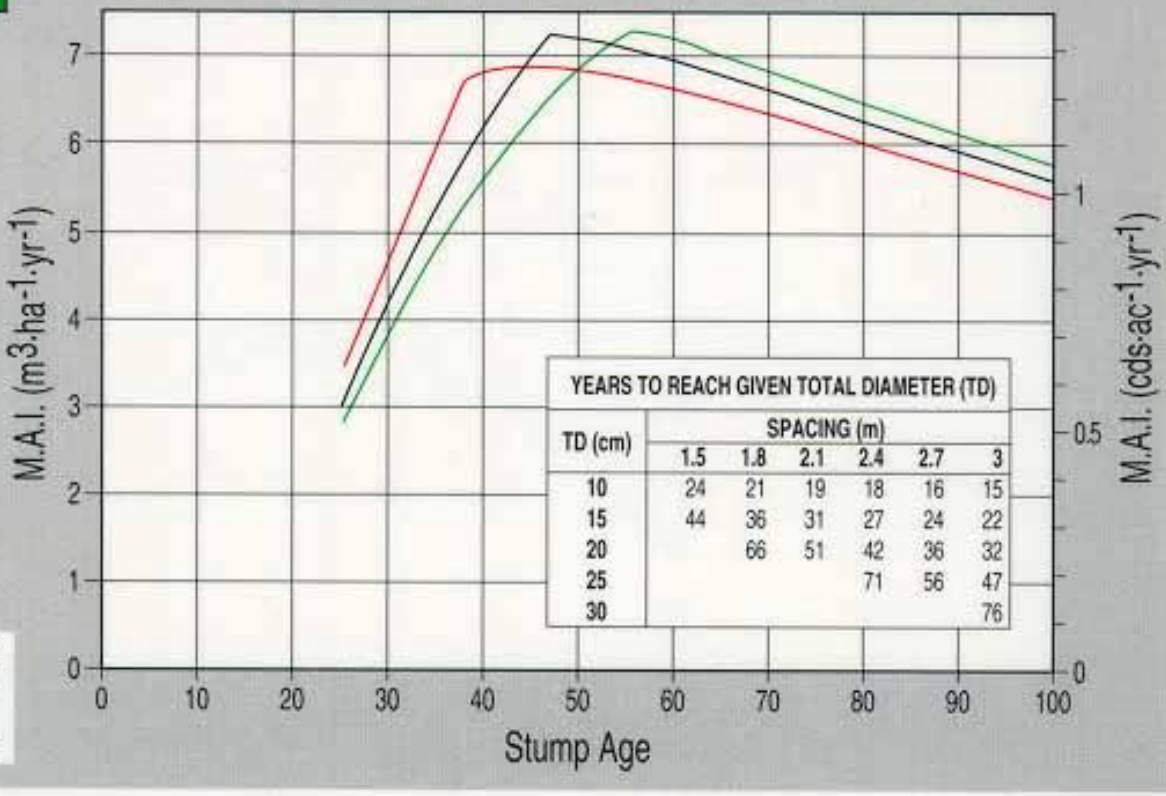
Plantation Red Spruce

LC 4

YEARS TO REACH GIVEN TOTAL DIAMETER (TD)

TD (cm)	SPACING (m) 1.5	1.8	2.1	2.4	2.7	3
10	27	24	21	19	18	17
15	49	40	34	30	27	24
20		77	56	46	39	35
25				83	62	51
30						87

LC 5



YEARS TO REACH GIVEN TOTAL DIAMETER (TD)

TD (cm)	SPACING (m) 1.5	1.8	2.1	2.4	2.7	3
10	24	21	19	18	16	15
15	44	36	31	27	24	22
20		66	51	42	36	32
25				71	56	47
30						76

SPACING (m)
- 1.8 x 1.8
- 2.4 x 2.4
- 3.0 x 3.0

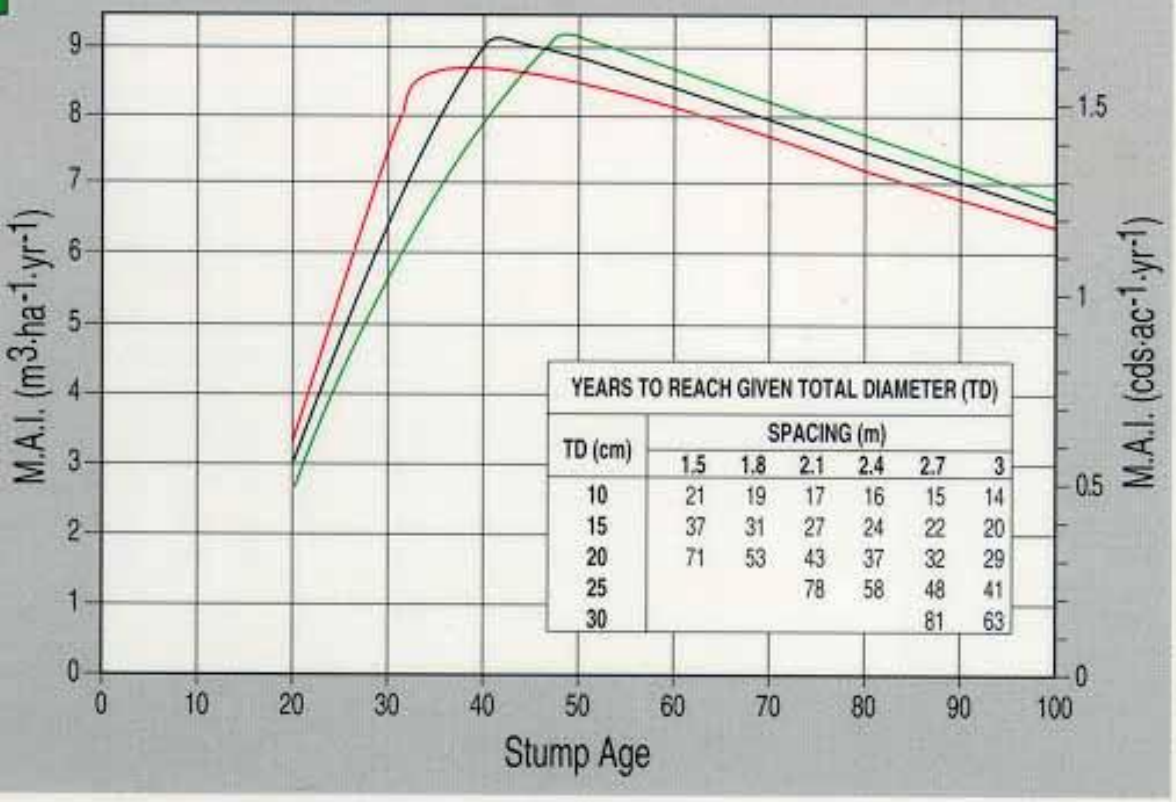
Plantation Red Spruce

LC 6

YEARS TO REACH GIVEN TOTAL DIAMETER (TD)

TD (cm)	SPACING (m)					
	1.5	1.8	2.1	2.4	2.7	3
10	22	20	18	17	15	14
15	40	33	29	25	23	21
20	83	58	46	39	34	30
25			90	64	52	44
30					93	69

LC 7

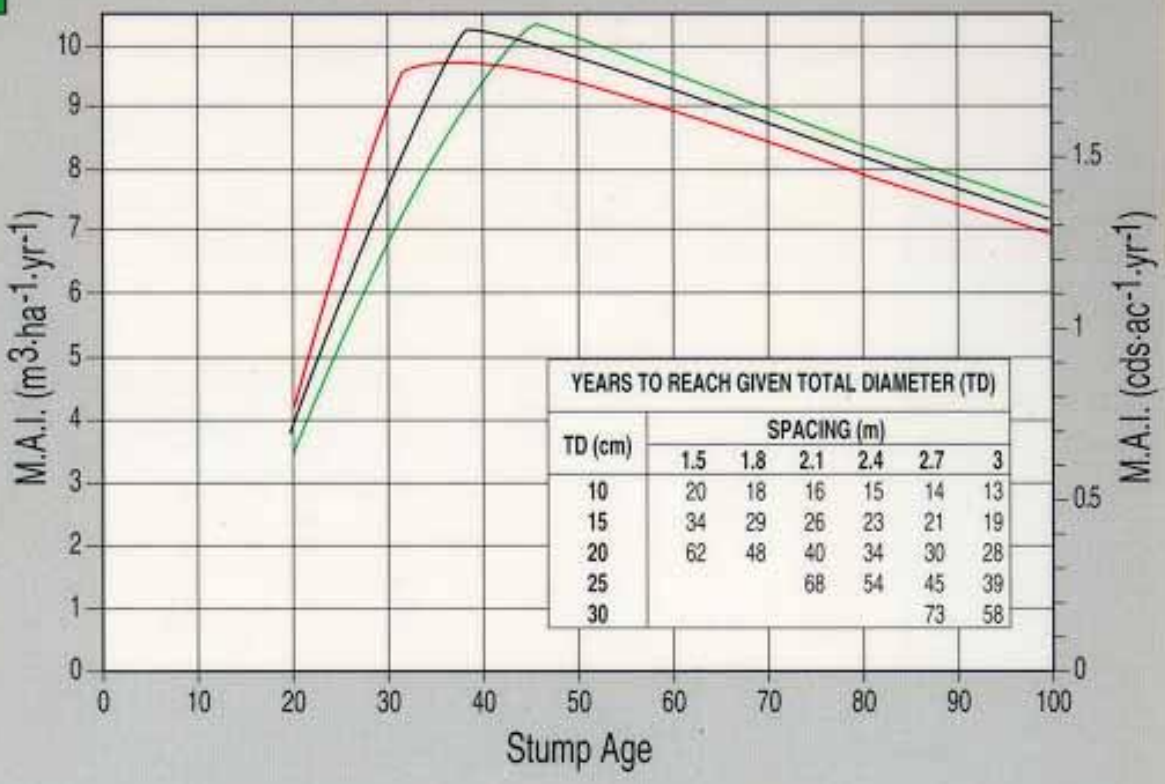


YEARS TO REACH GIVEN TOTAL DIAMETER (TD)

TD (cm)	SPACING (m)					
	1.5	1.8	2.1	2.4	2.7	3
10	21	19	17	16	15	14
15	37	31	27	24	22	20
20	71	53	43	37	32	29
25			78	58	48	41
30					81	63

Plantation Red Spruce

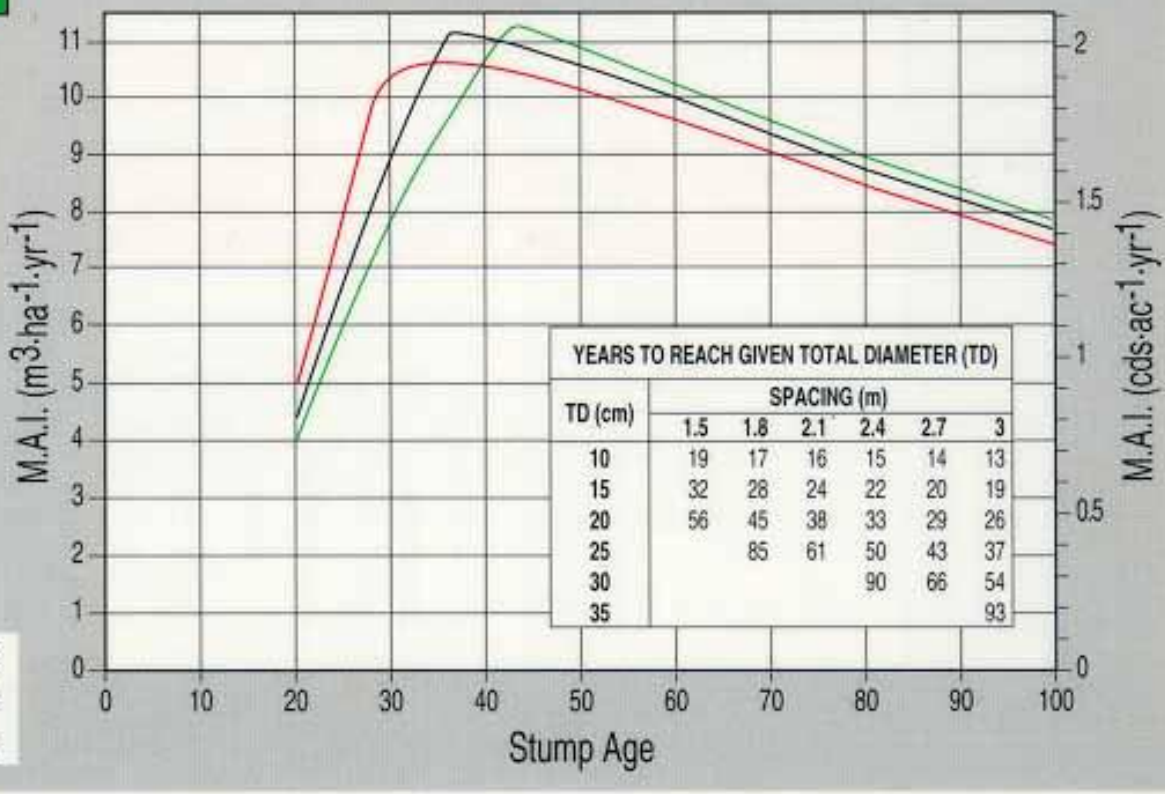
LC 8



YEARS TO REACH GIVEN TOTAL DIAMETER (TD)

TD (cm)	SPACING (m)					
	1.5	1.8	2.1	2.4	2.7	3
10	20	18	16	15	14	13
15	34	29	26	23	21	19
20	62	48	40	34	30	28
25			68	54	45	39
30					73	58

LC 9



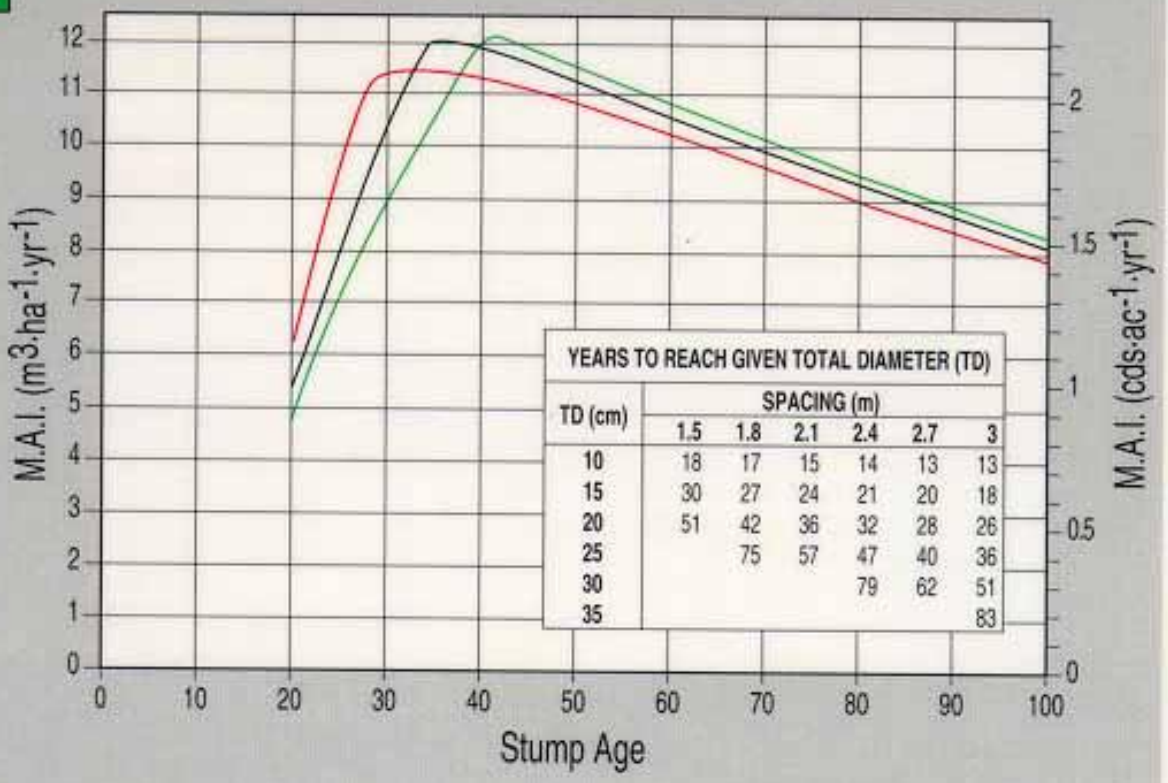
YEARS TO REACH GIVEN TOTAL DIAMETER (TD)

TD (cm)	SPACING (m)					
	1.5	1.8	2.1	2.4	2.7	3
10	19	17	16	15	14	13
15	32	28	24	22	20	19
20	56	45	38	33	29	26
25		85	61	50	43	37
30				90	66	54
35						93

SPACING (m)
- 1.8 x 1.8
- 2.4 x 2.4
- 3.0 x 3.0

Plantation Red Spruce

LC 10



YEARS TO REACH GIVEN TOTAL DIAMETER (TD)

TD (cm)	SPACING (m)					
	1.5	1.8	2.1	2.4	2.7	3
10	18	17	15	14	13	13
15	30	27	24	21	20	18
20	51	42	36	32	28	26
25		75	57	47	40	36
30				79	62	51
35						83

LC 11

YEARS TO REACH GIVEN TOTAL DIAMETER (TD)

TD (cm)	SPACING (m)					
	1.5	1.8	2.1	2.4	2.7	3
10	18	16	15	14	13	12
15	29	25	23	21	19	18
20	48	39	34	30	27	25
25	100	67	53	44	39	34
30				72	58	49
35						75

Plantation Red Spruce

LC 12

YEARS TO REACH GIVEN TOTAL DIAMETER (TD)

TD (cm)	SPACING (m)					
	1.5	1.8	2.1	2.4	2.7	3
10	17	15	14	13	13	12
15	27	24	22	20	18	17
20	44	37	32	29	26	24
25	85	61	50	42	37	33
30			89	66	54	46
35					93	70

LC 13

YEARS TO REACH GIVEN TOTAL DIAMETER (TD)

TD (cm)	SPACING (m)					
	1.5	1.8	2.1	2.4	2.7	3
10	16	14	13	13	12	11
15	26	23	21	19	18	16
20	41	35	31	27	25	23
25	74	56	46	40	35	31
30			79	61	51	44
35					83	65

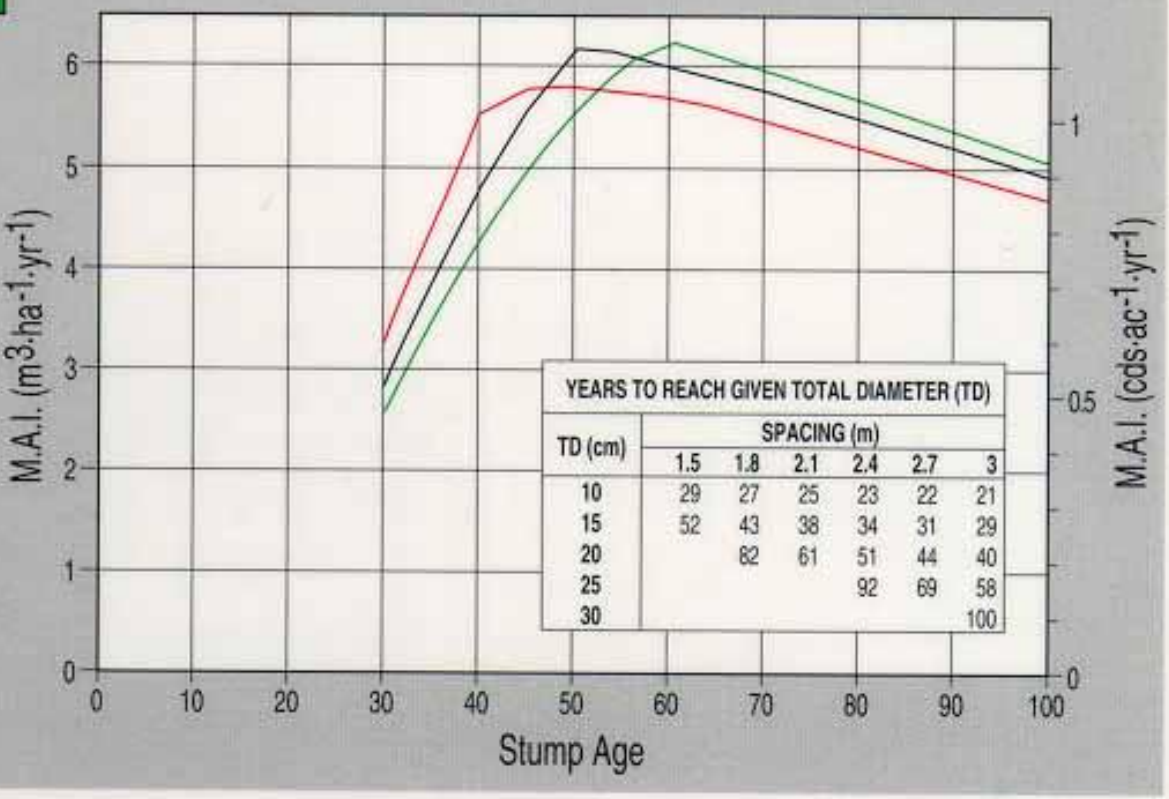
Pre-Commercial Thinning Red Spruce

LC 4

YEARS TO REACH GIVEN TOTAL DIAMETER (TD)

TD (cm)	SPACING (m)					
	1.5	1.8	2.1	2.4	2.7	3
10	34	31	29	28	27	26
15	60	50	43	39	36	34
20		100	71	58	50	45
25					79	65
30						

LC 5



YEARS TO REACH GIVEN TOTAL DIAMETER (TD)

TD (cm)	SPACING (m)					
	1.5	1.8	2.1	2.4	2.7	3
10	29	27	25	23	22	21
15	52	43	38	34	31	29
20		82	61	51	44	40
25				92	69	58
30						100

Pre-Commercial Thinning Red Spruce

LC 6

YEARS TO REACH GIVEN TOTAL DIAMETER (TD)

TD (cm)	SPACING (m)					
	1.5	1.8	2.1	2.4	2.7	3
10	27	24	23	22	21	20
15	46	39	35	32	29	27
20		70	55	47	42	38
25				79	63	53
30						88

LC 7

YEARS TO REACH GIVEN TOTAL DIAMETER (TD)

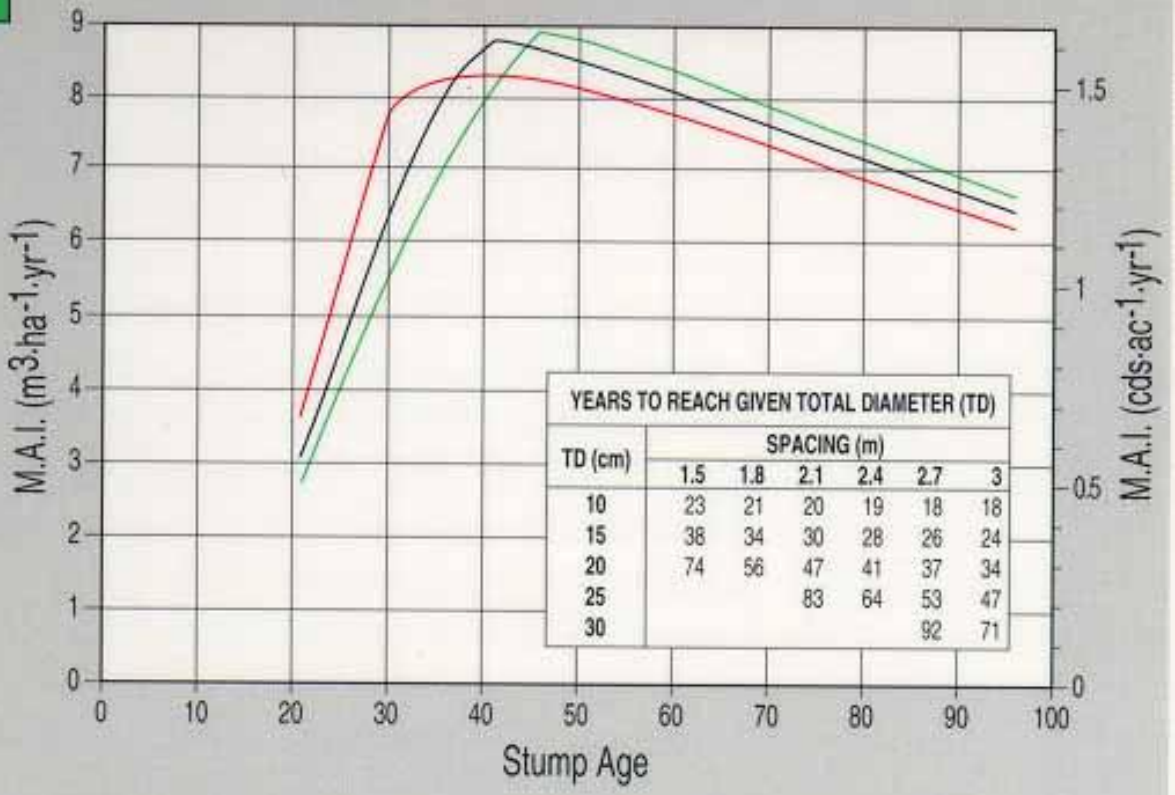
TD (cm)	SPACING (m)					
	1.5	1.8	2.1	2.4	2.7	3
10	25	23	21	20	19	19
15	42	36	33	30	28	26
20	88	63	51	44	39	36
25			100	71	58	50
30						78

SPACING (m)

- 1.8 x 1.8
- 2.4 x 2.4
- 3.0 x 3.0

Pre-Commercial Thinning Red Spruce

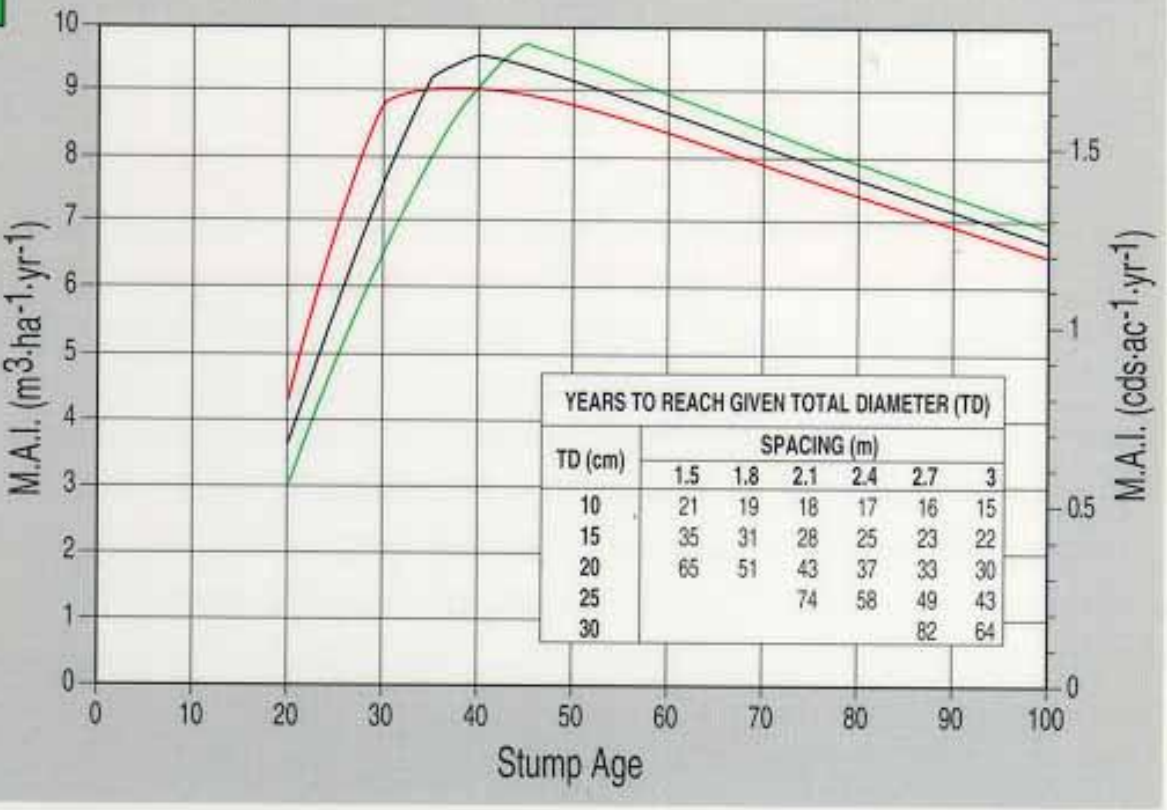
LC 8



YEARS TO REACH GIVEN TOTAL DIAMETER (TD)

TD (cm)	SPACING (m)					
	1.5	1.8	2.1	2.4	2.7	3
10	23	21	20	19	18	18
15	38	34	30	28	26	24
20	74	56	47	41	37	34
25			83	64	53	47
30					92	71

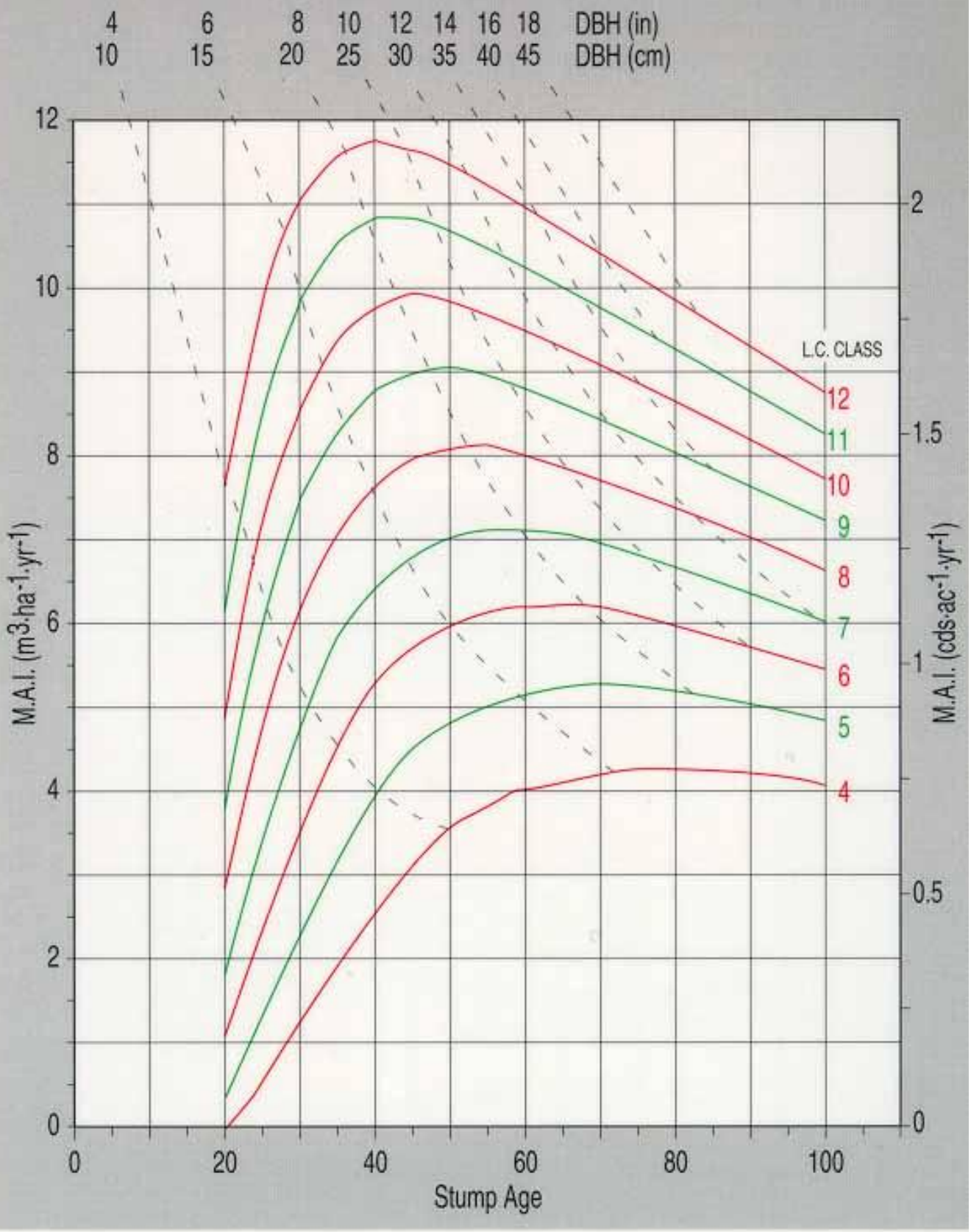
LC 9



YEARS TO REACH GIVEN TOTAL DIAMETER (TD)

TD (cm)	SPACING (m)					
	1.5	1.8	2.1	2.4	2.7	3
10	21	19	18	17	16	15
15	35	31	28	25	23	22
20	65	51	43	37	33	30
25			74	58	49	43
30					82	64

Fully Stocked Natural, Unmanaged Red Spruce Stands



Projected Peak Mean Annual Increment

In $m^3 \cdot ha^{-1} \cdot yr^{-1}$ by Land Capability (LC), Spacing, and Tree Species for Plantations, Pre-commercial Thinnings and Unmanaged Stands.

Spacing	Plantations						Unmanaged	Pre-Commercial Thinnings					
LC*	1.5	1.8	2.1	2.4	2.7	3.0		1.5	1.8	2.1	2.4	2.7	3.0
							Red Spruce						
4	5.5	5.8	6.0	6.1	6.2	6.2	4.2	4.6	4.9	5.1	5.2	5.2	5.2
5	6.5	6.8	7.1	7.2	7.2	7.3	5.2	5.5	5.8	6.0	6.2	6.3	6.3
6	7.5	7.8	8.1	8.2	8.3	8.3	6.2	6.3	6.6	6.9	7.0	7.1	7.1
7	8.3	8.7	9.0	9.1	9.3	9.3	7.1	7.1	7.4	7.6	7.8	7.9	7.9
8	9.3	9.7	10.0	10.2	10.3	10.3	8.1	7.9	8.3	8.5	8.7	8.8	8.8
9	10.2	10.6	10.9	11.0	11.2	11.2	9.0	8.7	9.1	9.4	9.6	9.7	9.7
10	11.1	11.5	11.8	12.0	12.0	12.1	9.9	9.5	9.8	10.1	10.4	10.5	10.5
11	12.0	12.4	12.7	13.0	13.0	13.1	10.8	10.3	10.7	11.0	11.2	11.2	11.4
12	12.8	13.2	13.6	13.8	14.0	14.0	11.7	11.1	11.5	11.8	12.0	12.2	12.3
							White Spruce						
4	5.0	5.3	5.5	5.6	5.6	5.6	3.9	4.2	4.5	4.6	4.7	4.8	4.8
5	5.9	6.3	6.5	6.6	6.6	6.7	4.8	5.0	5.3	5.5	5.6	5.7	5.7
6	6.8	7.1	7.4	7.5	7.5	7.5	5.6	5.7	6.0	6.3	6.4	6.5	6.5
7	7.6	8.0	8.2	8.3	8.4	8.4	6.4	6.4	6.7	7.0	7.1	7.2	7.2
8	8.5	8.8	9.1	9.3	9.3	9.4	7.3	7.2	7.5	7.8	8.0	8.0	8.0
9	9.3	9.7	10.0	10.1	10.2	10.2	8.2	7.9	8.3	8.5	8.7	8.9	8.9
10	10.1	10.4	10.7	11.0	10.9	10.9	9.0	8.6	9.0	9.2	9.5	9.5	9.5
11	10.9	11.2	11.6	11.8	11.8	11.9	9.8	9.4	9.7	10.0	10.2	10.2	10.4
12	11.7	12.1	12.4	12.5	12.7	12.7	10.6	10.1	10.4	10.7	10.9	11.1	11.1
							Black Spruce						
4	5.1	5.4	5.6	5.7	5.7	5.7	3.9	4.2	4.5	4.7	4.8	4.8	4.8
5	6.0	6.3	6.5	6.6	6.6	6.7	4.8	5.0	5.3	5.5	5.7	5.7	5.7
6	6.8	7.2	7.4	7.6	7.6	7.6	5.6	5.7	6.0	6.3	6.4	6.5	6.5
7	7.7	8.0	8.3	8.3	8.5	8.5	6.4	6.5	6.8	7.0	7.2	7.2	7.2
8	8.5	8.9	9.2	9.3	9.3	9.4	7.3	7.2	7.6	7.8	8.0	8.0	8.0
9	9.3	9.7	10.0	10.1	10.3	10.3	8.2	8.0	8.3	8.6	8.7	8.9	8.9
10	10.1	10.5	10.8	11.0	11.0	11.0	9.0	8.6	9.0	9.3	9.5	9.5	9.5
11	10.9	11.3	11.6	11.8	11.8	11.9	9.8	9.4	9.7	10.0	10.2	10.2	10.4
12	11.7	12.1	12.5	12.5	12.7	12.7	10.6	10.1	10.4	10.8	10.9	11.1	11.1
							Red Pine						
4	5.2	5.5	5.7	5.8	5.9	5.9	4.1	4.4	4.6	4.8	5.0	5.0	5.0
5	6.2	6.5	6.7	6.9	6.9	7.0	5.1	5.2	5.5	5.7	5.9	6.0	6.0
6	7.1	7.4	7.7	7.9	7.9	7.9	6.0	6.0	6.3	6.5	6.7	6.8	6.9
7	8.0	8.3	8.6	8.7	8.9	8.9	6.9	6.8	7.1	7.3	7.5	7.6	7.6
8	9.0	9.3	9.6	9.8	9.9	10.0	7.9	7.7	8.0	8.2	8.4	8.5	8.6
9	9.9	10.2	10.5	10.7	10.9	10.9	8.9	8.4	8.8	9.0	9.3	9.4	9.5
10	10.7	11.0	11.3	11.6	11.7	11.7	9.7	9.2	9.5	9.8	10.0	10.2	10.2
11	11.6	12.0	12.3	12.5	12.6	12.8	10.7	10.0	10.3	10.6	10.9	11.0	11.2
12	12.5	12.9	13.2	13.4	13.7	13.7	11.5	10.8	11.2	11.5	11.7	11.9	12.0
							White Pine						
4	5.1	5.4	5.6	5.7	5.8	5.8	4.0	4.3	4.5	4.7	4.9	4.9	4.9
5	6.1	6.4	6.6	6.7	6.8	6.8	5.0	5.1	5.4	5.6	5.8	5.9	5.9
6	7.0	7.3	7.5	7.7	7.8	7.8	5.9	5.9	6.2	6.4	6.6	6.7	6.8
7	7.9	8.2	8.4	8.6	8.7	8.7	6.8	6.7	7.0	7.2	7.4	7.5	7.5
8	8.8	9.1	9.4	9.6	9.7	9.8	7.8	7.5	7.8	8.0	8.3	8.4	8.4
9	9.7	10.0	10.3	10.5	10.7	10.7	8.7	8.3	8.6	8.9	9.1	9.3	9.3
10	10.5	10.9	11.1	11.4	11.5	11.5	9.5	9.1	9.4	9.6	9.8	10.0	10.1
11	11.4	11.8	12.1	12.3	12.4	12.6	10.5	9.9	10.2	10.4	10.7	10.8	11.0
12	12.3	12.7	13.0	13.2	13.4	13.4	11.4	10.6	11.0	11.3	11.5	11.7	11.8
							Balsam Fir						
4	5.2	5.6	5.8	5.8	5.8	5.8	3.9	4.3	4.6	4.8	4.9	4.9	4.9
5	6.2	6.5	6.7	6.8	6.8	6.8	4.8	5.1	5.4	5.7	5.8	5.8	5.8
6	7.0	7.4	7.6	7.7	7.7	7.7	5.7	5.9	6.2	6.4	6.5	6.6	6.6
7	7.8	8.2	8.4	8.5	8.6	8.6	6.5	6.6	6.9	7.2	7.3	7.3	7.3
8	8.7	9.1	9.4	9.4	9.4	9.4	7.3	7.3	7.7	7.9	8.1	8.1	8.1
9	9.5	9.9	10.2	10.2	10.3	10.3	8.1	8.0	8.4	8.7	8.8	9.0	9.0
10	10.2	10.6	10.9	11.1	11.1	11.1	8.9	8.7	9.1	9.4	9.6	9.6	9.6
11	11.0	11.5	11.8	11.8	11.8	11.8	9.8	9.4	9.8	10.1	10.3	10.3	10.3
12	11.8	12.3	12.6	12.6	12.7	12.7	10.5	10.1	10.5	10.9	10.9	11.1	11.1

*LC derived from CLI maps and Land Capability for Nova Scotia Softwoods (page 1).

Relative Effectiveness Guide for Herbicides

PRODUCT	PRODUCT RATE L/ha	PRODUCT RATE kg/ha	TARGET SPECIES: SUGAR MAPLE	RED MAPLE	BIRCHES	ASPEN	ALDERS	CHERRIES	WILLOWS	ELDERS	GRASSES	SEDGES	RASPBERRY	KALMIA	OTHER HERBS
VISION	3.2		×	◆	◆	◆	×	◆	◆	◆	◆	◆	◆	×	◆
	4.7		×	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
VELPAR L	8.3		×	×	?	?	?	?	?	?	◆	×	◆	×	◆
PRINCEP NINE-T		7.0	×	×	×	×	×	×	×	×	◆	?	×	×	◆
SIMAZINE 80W		8.2	×	×	×	×	×	×	×	×	◆	?	×	×	◆
ESTERON 600	5.6		×	×	◆	◆	◆	◆	◆	◆	×	×	◆	×	◆
RELEASE	4.7		×	◆	◆	◆	◆	◆	◆	?	×	?	◆	◆	◆
PRONONE 10G		20.0	×	×	?	?	?	?	?	?	◆	×	◆	×	◆

This guide is not intended to replace the label. Always read the label.

1 - All rates expressed in terms of product per hectare.
2 - CONVERSIONS L/ha x 0.356 = qts/ac; L/ha x 0.4047 = L/ac
3 - CONVERSIONS kg/ha x 1000 = gms/ha; kg/ha x 404.7 = gms/ac; kg/ha x 14.271 = oz/ac
4 - Other herbs include aster, goldenrod, etc.
5 - Control of some species reported inadequate is possible with spot treatments.

◆ ADEQUATE
× INADEQUATE
? INSUFFICIENT DATA

Label Approved Crop Species Guide for Herbicides

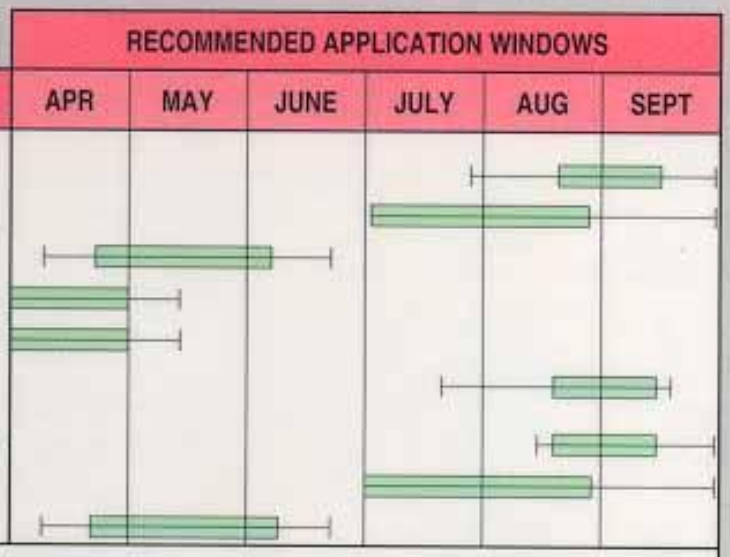
PRODUCT	TREATMENT L/ha	CROP SPECIES: RED SPRUCE	WHITE SPRUCE	BLACK SPRUCE	NORWAY SPRUCE	WHITE PINE	RED PINE	JACK PINE	BALSAM FIR	LARCH
VISION	Conifer Release [1]	◆	◆	◆	◆	◆	◆	◆	◆[3]	×
	Site Prep [2]	◆	◆	◆	◆	◆	◆	◆	◆	◆
VELPAR L [4]	Conifer Release [1]	×	🎄	🎄	×	×	🎄	×	🎄	×
	Site Prep [2]	×	◆	◆	×	×	×	◆	×	×
PRINCEP NINE-T	Conifer Release [1]	×	×	×	×	◆	×	×	◆	×
	Site Prep [2]	◆	◆	◆	◆	◆	◆	◆	◆	×
SIMAZINE 80W	Conifer Release [1]	×	×	×	×	◆	×	×	◆	×
	Site Prep [2]	×	×	×	×	×	×	×	×	×
ESTERON 600	Conifer Release [1]	◆	◆	◆	◆	◆	◆	◆	◆	×
	Site Prep [2]	◆	◆	◆	◆	◆	◆	◆	◆	◆
RELEASE	Conifer Release [1]	×	◆	◆	×	×	×	◆	×	×
	Site Prep [2]	◆	◆	◆	◆	◆	◆	◆	◆	◆
PRONONE 10G	Conifer Release [1]	×	×	×	×	×	×	×	×	×
	Site Prep [2]	×	◆	◆	×	×	◆	×	×	×

This guide is not intended to replace the label. Always read the label.

1 - Apply over the top to at least 2 year old seedlings established in the field for one growing season.
2 - Plant two weeks after herbicide application.
3 - Some damage may occur at higher rates.
4 - Velpar L is approved for forest use as a spot treatment for conifer release.

◆ LABEL APPROVED × LABEL NOT APPROVED 🎄 APPROVED FOR CHRISTMAS TREE PLANTATIONS ONLY

Application Timing Guide for Herbicides



Denotes treatment timing

Denotes preferred treatment timing

1 - FALL APPLICATION, following conifer hardening until 30% fall colouration.
2 - SPRING APPLICATION, following ground thaw.
Larch is extremely sensitive to over the top application of herbicides.

Application Methods Guide for Herbicides

PRODUCT	RECOMMENDED APPLICATION METHODS								
	AERIAL		GROUND						
	SITE PREPARATION	CONIFER RELEASE	SITE PREPARATION	CONIFER RELEASE	BASAL	SPOT (SOIL)	FRILL	STUMP	INJECTION
VISION	◆	◆	◆	◆	×	×	◆	×	◆
VELPAR L	◆	×	◆	🌲	×	◆	×	×	×
PRINCEP NINE-T	×	×	◆	◆	×	×	×	×	×
SIMAZINE 80W	×	×	×	◆	×	×	×	×	×
ESTERON 600	◆	◆	◆	◆	◆	×	◆	◆	×
RELEASE	×	×	◆	◆	◆	×	×	◆	×
PRONONE 10G	×	×	◆	×	×	×	×	×	×

This guide is not intended to replace the label. Always read the label.

◆ LABEL APPROVED × LABEL NOT APPROVED 🌲 CHRISTMAS TREES ONLY

Herbicide Equipment Guide

APPLICATION METHOD	PREFERRED[3] NOZZLE ASSEMBLIES	SWATH WIDTH[2] / NOZZLE HEIGHT[2]	RECOMMENDED TOTAL SOLUTION L/ha [1]			
			VELPAR L	SIMAZINE	VISION	ESTERON 600
AERIAL	D8-45 D8-46 8010 FF	15-22 15-30	40-60		40-60	
TRACTOR BOOM	11002 FF 8010 FF	VARIABLE 0.3 - 0.5	100-300	300	100-300	
TRACTOR BOOMLESS (cluster nozzle)	3/4 - 2TOC40	10-18 1.0 - 2.0	200-300	300	300	600
BACKPACK BOOM	11001 11002	VARIABLE 0.5 - 0.8	70-200	300	100-300	30
BACKPACK BOOMLESS (nozzle)	KLC5	4.5 - 7.0 1.0 1.7	100-200	300	300	600
BACKPACK FLOODJET (nozzle)	TK-2	1.2 - 2.0 1.0 - 1.5	70-200	300	100-300	30
MISTBLOWER	NA	3.5 - 6.5 1.0 - 1.5			200	
SPOT GUN	NA	NA NA	1 ml/cm of stump dia. or breast dia			
HYPO-HATCHET	NA	NA NA			1 ml/hack 5 cm apart 33% sol.	drench 5 % sol.

1 - Total solution is the total volume of water + herbicide delivered per hectare.
CONVERSIONS L/ha x 0.4047 = L/ac; L/ha x 0.089 = gal/ac

2 - Swath width (effective distance covered by spray) and nozzle height (distance from ground to nozzle during application) are both expressed in metres.

3 - Nozzles described are TEE-JET type: similar nozzles by other manufacturers may be substituted.

Herbicide Calibration Guide

Metric

Total solution (L/ha) *** = $\frac{\text{Flow rate ** (L/min)} \times 10000}{\text{Swath (m)} \times \text{Speed (m/min)}}$

Litres product/tank = $\frac{\text{Tank capacity (L)} \times \text{Product rate * (L/ha)}}{\text{Total solution (L/ha)}}$

Imperial

Total solution (gal/ac) *** = $\frac{\text{Flow rate ** (oz/min)} \times 272.25}{\text{Swath (ft)} \times \text{Speed (ft/min)}}$

Ounces product/tank = $\frac{\text{Tank capacity (gal)} \times \text{Product rate * (oz/ac)}}{\text{Total solution (gal/ac)}}$

* For information on product rate see "Relative Effectiveness Guide for Herbicides".

** Flow rate is the amount of liquid emitted from the nozzle at operating pressure, usually determined using water.

*** For nonbroadcast treatments (e.g., strips), multiply this value by fraction of hectare sprayed.

Environmental Regulation Guide for Herbicides*

Category	Regulation
Licence	• Any person applying a pesticide for reward or hire must hold a valid applicator's license
Permits	• Forested Land - Permit required • Copy of permit required at loading/mixing area • Submit application for permit to NSDOE at least 60 days in advance • Submit "Daily Use Forms" 30 days following operation
Potable Water	• 60 metre buffer
Watercourse	• 30 metre buffer, unless a greater distance is stated on the label and/or permit
Watershed	• Follow all requirements imposed by Department of Health
Signs	• Site posted at least 30 days before spraying commences • Removal no sooner than 7 days after spraying, no later than November 1 • Fluorescent decal applied to sign when spraying begins • Standardize sign required (Contact NSDOE for information)
Notification	• Any dwelling, business, school, public building within 500 metres of the site must be notified at least 15 days before spraying by delivery of written information • If area under permit exceeds 200 ha, a written notice must be published or broadcast
Label	• Always read and follow label and permit directions and limitations

* For complete regulations read Pest Control Products Licence and Permit Regulations published by the NSDOE

Factors for Calculating Softwood Merchantable Volume (m^3/ha)

Average Merchantable Diameter* (cm)	Average Merchantable Height* (m)							
	8	10	12	14	16	18	20	22
10	2.3	2.8	3.3	3.8	4.3	4.8	5.3	5.8
12	2.9	3.6	4.3	4.9	5.6	6.2	6.8	7.4
14	3.2	4.0	4.7	5.5	6.2	6.9	7.5	8.2
16	3.4	4.2	5.0	5.7	6.5	7.2	7.9	8.6
18	3.5	4.3	5.1	5.9	6.6	7.4	8.1	8.8
20	3.5	4.4	5.2	6.0	6.7	7.5	8.2	9.0
22	3.6	4.4	5.2	6.0	6.8	7.6	8.3	9.1
24	3.6	4.4	5.3	6.1	6.9	7.6	8.4	9.1
26	3.6	4.5	5.3	6.1	6.9	7.7	8.4	9.2
28	3.6	4.5	5.3	6.1	6.9	7.7	8.5	9.2
30	3.6	4.5	5.3	6.1	6.9	7.7	8.5	9.2
32	3.6	4.5	5.3	6.2	7.0	7.7	8.5	9.2
34	3.6	4.5	5.3	6.2	7.0	7.8	8.5	9.3
36	3.7	4.5	5.4	6.2	7.0	7.8	8.5	9.3
38	3.7	4.5	5.4	6.2	7.0	7.8	8.5	9.3
40	3.7	4.5	5.4	6.2	7.0	7.8	8.5	9.3
42	3.7	4.5	5.4	6.2	7.0	7.8	8.6	9.3
44	3.7	4.5	5.4	6.2	7.0	7.8	8.6	9.3
46	3.7	4.5	5.4	6.2	7.0	7.8	8.6	9.3
48	3.7	4.5	5.4	6.2	7.0	7.8	8.6	9.3
50	3.7	4.5	5.4	6.2	7.0	7.8	8.6	9.3
52	3.7	4.5	5.4	6.2	7.0	7.8	8.6	9.3
54	3.7	4.5	5.4	6.2	7.0	7.8	8.6	9.3
56	3.7	4.5	5.4	6.2	7.0	7.8	8.6	9.3
58	3.7	4.5	5.4	6.2	7.0	7.8	8.6	9.3
60	3.7	4.5	5.4	6.2	7.0	7.8	8.6	9.3

* Based on merchantable trees ≥ 9 cm DBHob

To obtain Merchantable Volume (m^3/ha), multiply factor by Merchantable Basal Area (m^2/ha).

Factors for Calculating Hardwood Merchantable Volume (m^3/ha)

Average Merchantable Diameter* (cm)	Average Merchantable Height* (m)							
	8	10	12	14	16	18	20	22
10	2.1	2.6	3.1	3.5	4.0	4.4	4.8	5.2
12	2.7	3.3	3.9	4.5	5.1	5.6	6.2	6.7
14	3.0	3.7	4.3	5.0	5.6	6.2	6.8	7.4
16	3.1	3.9	4.6	5.2	5.9	6.5	7.1	7.7
18	3.2	4.0	4.7	5.4	6.0	6.7	7.3	7.9
20	3.3	4.0	4.8	5.5	6.1	6.8	7.4	8.1
22	3.3	4.1	4.8	5.5	6.2	6.9	7.5	8.2
24	3.3	4.1	4.8	5.6	6.3	6.9	7.6	8.2
26	3.4	4.1	4.9	5.6	6.3	7.0	7.6	8.3
28	3.4	4.1	4.9	5.6	6.3	7.0	7.6	8.3
30	3.4	4.1	4.9	5.6	6.3	7.0	7.7	8.3
32	3.4	4.2	4.9	5.6	6.3	7.0	7.7	8.3
34	3.4	4.2	4.9	5.6	6.3	7.0	7.7	8.3
36	3.4	4.2	4.9	5.7	6.4	7.0	7.7	8.4
38	3.4	4.2	4.9	5.7	6.4	7.1	7.7	8.4
40	3.4	4.2	4.9	5.7	6.4	7.1	7.7	8.4
42	3.4	4.2	4.9	5.7	6.4	7.1	7.7	8.4
44	3.4	4.2	4.9	5.7	6.4	7.1	7.7	8.4
46	3.4	4.2	4.9	5.7	6.4	7.1	7.7	8.4
48	3.4	4.2	4.9	5.7	6.4	7.1	7.7	8.4
50	3.4	4.2	4.9	5.7	6.4	7.1	7.7	8.4
52	3.4	4.2	4.9	5.7	6.4	7.1	7.7	8.4
54	3.4	4.2	5.0	5.7	6.4	7.1	7.8	8.4
56	3.4	4.2	5.0	5.7	6.4	7.1	7.8	8.4
58	3.4	4.2	5.0	5.7	6.4	7.1	7.8	8.4
60	3.4	4.2	5.0	5.7	6.4	7.1	7.8	8.4

* Based on merchantable trees ≥ 9 cm DBHob

To obtain Merchantable Volume (m^3/ha), multiply factor by Merchantable Basal Area (m^2/ha).

Factors for Calculating Softwood Sawlog Volume (fbm/ha)

Average Sawlog Diameter* (cm)	Average Sawlog Height* (m)							
	15	16	17	18	19	20	21	22
16	963	1021	1079	1137	1193	1250	1305	1360
18	1062	1127	1191	1254	1317	1378	1440	1500
20	1124	1193	1260	1327	1393	1458	1523	1587
22	1165	1236	1306	1375	1443	1511	1578	1644
24	1193	1265	1337	1408	1478	1547	1615	1683
26	1213	1286	1359	1431	1502	1573	1642	1711
28	1228	1302	1376	1449	1521	1592	1662	1732
30	1239	1314	1388	1462	1534	1606	1677	1748
32	1248	1323	1398	1472	1545	1618	1689	1760
34	1254	1331	1406	1480	1554	1626	1698	1770
36	1260	1336	1412	1487	1561	1634	1706	1777
38	1265	1341	1417	1492	1566	1640	1712	1784
40	1268	1345	1421	1497	1571	1644	1717	1789
42	1272	1349	1425	1500	1575	1649	1721	1794
44	1274	1351	1428	1503	1578	1652	1725	1797
46	1277	1354	1430	1506	1581	1655	1728	1800
48	1278	1356	1433	1508	1583	1657	1731	1803
50	1280	1358	1435	1510	1585	1660	1733	1806
52	1282	1359	1436	1512	1587	1662	1735	1808
54	1283	1361	1438	1514	1589	1663	1737	1810
56	1284	1362	1439	1515	1590	1665	1738	1811
58	1285	1363	1440	1516	1592	1666	1740	1813
60	1286	1364	1441	1517	1593	1667	1741	1814

* Based on sawlog quality trees ≥ 14 cm DBHob

To obtain Sawlog Volume (fbm/ha), multiply factor by Sawlog Basal Area (m^2/ha).

Factors for Calculating Hardwood Sawlog Volume (fbm/ha)

Average Sawlog Diameter* (cm)	Average Sawlog Height* (m)							
	15	16	17	18	19	20	21	22
16	879	931	981	1031	1081	1129	1177	1224
18	970	1027	1083	1138	1192	1246	1298	1350
20	1027	1087	1146	1204	1261	1318	1373	1428
22	1064	1126	1187	1247	1307	1365	1423	1479
24	1089	1153	1216	1277	1338	1398	1457	1515
26	1108	1172	1236	1299	1360	1421	1481	1540
28	1121	1187	1251	1314	1377	1438	1499	1559
30	1131	1197	1262	1326	1390	1452	1513	1573
32	1139	1206	1271	1336	1399	1462	1523	1584
34	1146	1213	1278	1343	1407	1470	1532	1593
36	1151	1218	1284	1349	1413	1476	1539	1600
38	1155	1222	1289	1354	1418	1482	1544	1606
40	1158	1226	1293	1358	1423	1486	1549	1610
42	1161	1229	1296	1361	1426	1490	1552	1614
44	1164	1232	1298	1364	1429	1493	1556	1618
46	1166	1234	1301	1367	1432	1496	1559	1621
48	1168	1236	1303	1369	1434	1498	1561	1623
50	1169	1237	1305	1371	1436	1500	1563	1625
52	1171	1239	1306	1372	1437	1502	1565	1627
54	1172	1240	1307	1374	1439	1503	1566	1629
56	1173	1241	1309	1375	1440	1504	1568	1630
58	1174	1242	1310	1376	1441	1506	1569	1632
60	1175	1243	1311	1377	1442	1507	1570	1633

* Based on sawlog quality trees ≥ 14 cm DBHob

To obtain Sawlog Volume (fbm/ha), multiply factor by Sawlog Basal Area (m^2/ha).

New Brunswick Log Rule (fbm)

Thumb	Diam. In.	Length (feet)										
		8	9	10	11	12	13	14	15	16	17	18
	3	3	3	3	3	4	4	5	5	6		
	4	4	5	5	6	7	7	8	9	9		
L - 2	5	6	7	8	9	10	11	12	13	14	15	16
L + 3	6	10	11	12	14	15	17	18	19	20	22	23
2L - 1	7	15	17	19	21	23	25	27	29	31	33	35
2.5 x L	8	20	23	25	28	30	33	35	38	40	43	45
3 x L	9	24	27	30	33	36	39	42	45	48	51	54
4 x L	10	32	36	40	44	48	52	56	60	64	68	72
5 x L	11	40	45	50	55	60	65	70	75	80	85	90
6 x L	12	48	54	60	66	72	78	84	90	96	102	108
7 x L	13	56	63	70	77	84	91	98	105	112	119	126
8L + 2	14	65	74	82	90	98	106	114	122	130	139	147
	15	75	84	93	102	112	121	131	140	150	159	168
	16	85	96	107	117	128	138	149	159	170	181	192
	17	99	111	124	136	149	161	174	186	198	210	223
	18	115	129	143	158	172	186	200	215	229	244	258
	19	131	147	163	180	196	212	228	245	261	278	294
	20	150	168	187	206	225	243	262	281	300	318	337
	21	164	185	206	227	247	268	288	308	327	349	370
	22	181	204	227	250	272	295	317	340	362	385	408
	23	188	223	248	272	297	317	336	356	376	411	445
	24	216	243	270	297	324	352	380	406	432	459	486
	25	238	268	298	328	358	388	419	448	477	507	537
	26	253	285	317	348	380	411	444	475	507	538	570
	27	273	307	341	375	410	444	478	512	546	580	615
	28	307	345	384	422	460	498	537	575	614	652	690
	29	329	370	410	452	495	535	575	616	657	698	739
	30	353	397	441	485	530	574	618	662	706	750	795

Metric Deductions (Stacked Wood)

Softwood			Hardwood		
Diam. (cm)	m^3 (stacked)	Mass (kg)	Diam. (cm)	m^3 (stacked)	Mass (kg)
8-14	0.02	10	8-14	0.02	10
16-26	0.07	40	16-26	0.08	40
28-38	0.17	90	28-38	0.18	110
40-50	0.31	160	40-50	0.34	200
52-62	0.50	260	52-62	0.55	310
64-76	0.75	400	64-76	0.82	480
78-90	1.08	570	78-90	1.10	680

Spacing in Metres by Average Basal Area and Average Diameter

TBA* m^2/ha	Total Average Diameter (cm)															
	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44
20.0	2.8	3.2	3.6	4.0	4.4	4.8	5.2	5.5	5.9	6.3	6.7	7.1	7.5	7.9	8.3	8.7
22.0	2.6	3.0	3.4	3.8	4.2	4.5	4.9	5.3	5.7	6.0	6.4	6.8	7.2	7.6	7.9	8.3
24.0	2.5	2.9	3.3	3.6	4.0	4.3	4.7	5.1	5.4	5.8	6.2	6.5	6.9	7.2	7.6	8.0
26.0	2.4	2.8	3.1	3.5	3.8	4.2	4.5	4.9	5.2	5.6	5.9	6.3	6.6	7.0	7.3	7.6
28.0	2.3	2.7	3.0	3.3	3.7	4.0	4.4	4.7	5.0	5.4	5.7	6.0	6.4	6.7	7.0	7.4
30.0	2.3	2.6	2.9	3.2	3.6	3.9	4.2	4.5	4.9	5.2	5.5	5.8	6.1	6.5	6.8	7.1
32.0	2.2	2.5	2.8	3.1	3.4	3.8	4.1	4.4	4.7	5.0	5.3	5.6	6.0	6.3	6.6	6.9
34.0	2.1	2.4	2.7	3.0	3.3	3.6	4.0	4.3	4.6	4.9	5.2	5.5	5.8	6.1	6.4	6.7
36.0	2.1	2.4	2.7	3.0	3.2	3.5	3.8	4.1	4.4	4.7	5.0	5.3	5.6	5.9	6.2	6.5
38.0	2.0	2.3	2.6	2.9	3.2	3.5	3.7	4.0	4.3	4.6	4.9	5.2	5.5	5.8	6.0	6.3
40.0	2.0	2.2	2.5	2.8	3.1	3.4	3.6	3.9	4.2	4.5	4.8	5.0	5.3	5.6	5.9	6.2
42.0	1.9	2.2	2.5	2.7	3.0	3.3	3.6	3.8	4.1	4.4	4.6	4.9	5.2	5.5	5.7	6.0
44.0	1.9	2.1	2.4	2.7	2.9	3.2	3.5	3.7	4.0	4.3	4.5	4.8	5.1	5.3	5.6	5.9
46.0	1.8	2.1	2.4	2.6	2.9	3.1	3.4	3.7	3.9	4.2	4.4	4.7	5.0	5.2	5.5	5.7
48.0	1.8	2.0	2.3	2.6	2.8	3.1	3.3	3.6	3.8	4.1	4.3	4.6	4.9	5.1	5.4	5.6
50.0	1.8	2.0	2.3	2.5	2.8	3.0	3.3	3.5	3.8	4.0	4.3	4.5	4.8	5.0	5.3	5.5
52.0	1.7	2.0	2.2	2.5	2.7	2.9	3.2	3.4	3.7	3.9	4.2	4.4	4.7	4.9	5.2	5.4
54.0	1.7	1.9	2.2	2.4	2.7	2.9	3.1	3.4	3.6	3.9	4.1	4.3	4.6	4.8	5.1	5.3
56.0	1.7	1.9	2.1	2.4	2.6	2.8	3.1	3.3	3.6	3.8	4.0	4.3	4.5	4.7	5.0	5.2
58.0	1.6	1.9	2.1	2.3	2.6	2.8	3.0	3.3	3.5	3.7	4.0	4.2	4.4	4.7	4.9	5.1

Total Number of Trees Per Hectare

Spacing metres	Spacing (0.1m)									
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
1	10000	8264	6944	5917	5102	4444	3906	3460	3086	2770
2	2500	2268	2066	1890	1736	1600	1479	1372	1276	1189
3	1111	1041	977	918	865	816	772	730	693	657
4	625	595	567	541	517	494	473	453	434	416
5	400	384	370	356	343	331	319	308	297	287
6	278	269	260	252	244	237	230	223	216	210
7	204	198	193	188	183	178	173	169	164	160
8	156	152	149	145	142	138	135	132	129	126

* Total Basal Area

Individual Tree Basal Area
Square Metres From Diameter in Centimetres

Diameter	0.0	0.2	0.4	0.6	0.8
0	.0000	.0000	.0000	.0000	.0001
1	.0001	.0001	.0002	.0002	.0003
2	.0003	.0004	.0005	.0005	.0006
3	.0007	.0008	.0009	.0010	.0011
4	.0013	.0014	.0015	.0017	.0018
5	.0020	.0021	.0023	.0025	.0026
6	.0028	.0030	.0032	.0034	.0036
7	.0038	.0041	.0043	.0045	.0048
8	.0050	.0053	.0055	.0058	.0061
9	.0064	.0066	.0069	.0072	.0075
10	.0079	.0082	.0085	.0088	.0092
11	.0095	.0099	.0102	.0106	.0109
12	.0113	.0117	.0121	.0125	.0129
13	.0133	.0137	.0141	.0145	.0150
14	.0154	.0158	.0163	.0167	.0172
15	.0177	.0181	.0186	.0191	.0196
16	.0201	.0206	.0211	.0216	.0222
17	.0227	.0232	.0238	.0243	.0249
18	.0254	.0260	.0266	.0272	.0278
19	.0284	.0290	.0296	.0302	.0308
20	.0314	.0320	.0327	.0333	.0340
21	.0346	.0353	.0360	.0366	.0373
22	.0380	.0387	.0394	.0401	.0408
23	.0415	.0423	.0430	.0437	.0445
24	.0452	.0460	.0468	.0475	.0483
25	.0491	.0499	.0507	.0515	.0523
26	.0531	.0539	.0547	.0556	.0564
27	.0573	.0581	.0590	.0598	.0607
28	.0616	.0625	.0633	.0642	.0651
29	.0661	.0670	.0679	.0688	.0697
30	.0707	.0716	.0726	.0735	.0745
31	.0755	.0765	.0774	.0784	.0794
32	.0804	.0814	.0824	.0835	.0845
33	.0855	.0866	.0876	.0887	.0897
34	.0908	.0919	.0929	.0940	.0951
35	.0962	.0973	.0984	.0995	.1007
36	.1018	.1029	.1041	.1052	.1064
37	.1075	.1087	.1099	.1110	.1122
38	.1134	.1146	.1158	.1170	.1182
39	.1195	.1207	.1219	.1232	.1244
40	.1257	.1269	.1282	.1295	.1307
41	.1320	.1333	.1346	.1359	.1372
42	.1385	.1399	.1412	.1425	.1439
43	.1452	.1466	.1479	.1493	.1507
44	.1521	.1534	.1548	.1562	.1576
45	.1590	.1605	.1619	.1633	.1647
46	.1662	.1676	.1691	.1706	.1720
47	.1735	.1750	.1765	.1780	.1795
48	.1810	.1825	.1840	.1855	.1870
49	.1886	.1901	.1917	.1932	.1948
50	.1963	.1979	.1995	.2011	.2027

Horizontal Limiting Distance* for Trees of a Given Diameter
Basal Area Factor 1.0

Diameter cm	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0	0.001	0.051	0.101	0.150	0.200	0.250	0.301	0.350	0.400	0.450
1	0.501	0.550	0.600	0.650	0.701	0.751	0.801	0.850	0.900	0.951
2	1.000	1.051	1.100	1.151	1.201	1.250	1.301	1.350	1.401	1.451
3	1.500	1.551	1.600	1.651	1.701	1.750	1.801	1.850	1.901	1.951
4	2.000	2.050	2.101	2.151	2.201	2.250	2.300	2.351	2.401	2.451
5	2.500	2.550	2.601	2.651	2.701	2.750	2.800	2.851	2.901	2.951
6	3.002	3.050	3.101	3.151	3.201	3.250	3.300	3.351	3.401	3.451
7	3.500	3.550	3.601	3.651	3.701	3.750	3.800	3.851	3.901	3.951
8	4.001	4.050	4.101	4.150	4.201	4.251	4.300	4.351	4.400	4.451
9	4.501	4.550	4.601	4.650	4.701	4.751	4.800	4.851	4.900	4.951
10	5.001	5.050	5.101	5.150	5.201	5.251	5.300	5.351	5.400	5.451
11	5.501	5.550	5.601	5.650	5.701	5.751	5.800	5.851	5.900	5.951
12	6.001	6.050	6.101	6.150	6.201	6.251	6.300	6.351	6.400	6.451
13	6.501	6.550	6.601	6.650	6.701	6.751	6.800	6.851	6.900	6.951
14	7.001	7.050	7.101	7.150	7.201	7.251	7.300	7.351	7.400	7.451
15	7.501	7.550	7.601	7.650	7.701	7.751	7.800	7.851	7.900	7.951
16	8.000	8.050	8.101	8.151	8.200	8.250	8.300	8.351	8.401	8.450
17	8.500	8.550	8.601	8.651	8.700	8.750	8.800	8.851	8.901	8.950
18	9.000	9.050	9.101	9.151	9.200	9.250	9.300	9.351	9.401	9.450
19	9.500	9.550	9.601	9.651	9.700	9.750	9.800	9.851	9.901	9.950
20	10.000	10.050	10.101	10.151	10.200	10.250	10.300	10.351	10.401	10.450
21	10.500	10.550	10.601	10.651	10.700	10.750	10.800	10.851	10.901	10.950
22	11.000	11.050	11.101	11.151	11.200	11.250	11.300	11.351	11.401	11.450
23	11.500	11.550	11.601	11.651	11.700	11.750	11.800	11.851	11.901	11.950
24	12.000	12.050	12.101	12.151	12.200	12.250	12.300	12.351	12.401	12.450
25	12.500	12.550	12.601	12.651	12.700	12.750	12.800	12.851	12.901	12.950
26	13.000	13.050	13.101	13.151	13.200	13.250	13.300	13.351	13.401	13.450
27	13.500	13.550	13.601	13.651	13.700	13.750	13.800	13.851	13.901	13.950
28	14.000	14.050	14.101	14.151	14.200	14.250	14.300	14.351	14.401	14.450
29	14.500	14.550	14.601	14.651	14.700	14.750	14.800	14.851	14.901	14.950
30	15.000	15.050	15.101	15.151	15.200	15.250	15.300	15.351	15.401	15.450
31	15.500	15.550	15.601	15.651	15.700	15.750	15.800	15.851	15.901	15.950
32	16.000	16.051	16.101	16.150	16.201	16.250	16.301	16.351	16.400	16.451
33	16.500	16.551	16.601	16.650	16.701	16.750	16.801	16.851	16.900	16.951
34	17.000	17.051	17.101	17.150	17.201	17.250	17.301	17.351	17.400	17.451
35	17.500	17.551	17.601	17.650	17.701	17.750	17.801	17.851	17.900	17.951
36	18.000	18.514	18.101	18.150	18.201	18.250	18.301	18.351	18.400	18.451
37	18.500	18.551	18.601	18.650	18.701	18.750	18.801	18.851	18.900	18.951
38	19.000	19.051	19.101	19.150	19.201	19.250	19.301	19.351	19.400	19.451
39	19.500	19.551	19.601	19.650	19.701	19.750	19.801	19.851	19.900	19.951
40	20.000	20.051	20.101	20.150	20.201	20.250	20.301	20.351	20.400	20.451
41	20.500	20.551	20.601	20.651	20.701	20.750	20.801	20.851	20.900	20.951
42	21.000	21.051	21.101	21.150	21.201	21.250	21.301	21.351	21.400	21.451
43	21.500	21.551	21.601	21.650	21.701	21.750	21.801	21.851	21.900	21.951
44	22.000	22.051	22.101	22.150	22.201	22.250	22.301	22.351	22.400	22.451
45	22.500	22.551	22.601	22.650	22.701	22.750	22.801	22.851	22.900	22.951
46	23.000	23.051	23.101	23.150	23.201	23.250	23.301	23.351	23.400	23.451
47	23.500	23.551	23.601	23.650	23.701	23.750	23.801	23.851	23.900	23.951
48	24.000	24.051	24.101	24.150	24.201	24.250	24.301	24.351	24.400	24.451
49	24.500	24.551	24.601	24.650	24.701	24.750	24.801	24.851	24.900	24.951
50	25.000	25.051	25.101	25.150	25.201	25.250	25.301	25.351	25.400	25.451
51	25.500	25.551	25.601	25.650	25.701	25.750	25.801	25.851	25.900	25.951
52	26.000	26.051	26.101	26.150	26.201	26.250	26.301	26.351	26.400	26.451
53	26.500	26.551	26.601	26.650	26.701	26.750	26.801	26.851	26.900	26.951
54	27.000	27.051	27.101	27.150	27.201	27.250	27.301	27.351	27.400	27.451
55	27.500	27.551	27.601	27.650	27.701	27.750	27.801	27.851	27.900	27.951
56	28.000	28.051	28.101	28.150	28.201	28.250	28.301	28.351	28.400	28.451
57	28.500	28.551	28.601	28.650	28.701	28.750	28.801	28.851	28.900	28.951
58	29.000	29.051	29.101	29.150	29.201	29.250	29.301	29.351	29.400	29.451
59	29.500	29.551	29.601	29.650	29.701	29.750	29.801	29.851	29.900	29.951
60	30.000	30.051	30.101	30.150	30.201	30.250	30.301	30.351	30.400	30.451

*metres

Horizontal Limiting Distance* for Trees of a Given Diameter
Basal Area Factor 2.0

Diameter cm	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0	0.001	0.036	0.071	0.107	0.142	0.177	0.213	0.248	0.283	0.319
1	0.354	0.389	0.425	0.460	0.495	0.531	0.566	0.602	0.637	0.672
2	0.708	0.743	0.778	0.814	0.849	0.884	0.920	0.955	0.990	1.026
3	1.061	1.097	1.132	1.167	1.203	1.238	1.273	1.309	1.344	1.379
4	1.415	1.450	1.485	1.521	1.556	1.591	1.627	1.662	1.698	1.733
5	1.768	1.804	1.839	1.874	1.910	1.945	1.980	2.016	2.051	2.086
6	2.122	2.157	2.193	2.228	2.263	2.299	2.334	2.369	2.405	2.440
7	2.475	2.511	2.546	2.581	2.617	2.652	2.688	2.723	2.758	2.794
8	2.829	2.864	2.900	2.935	2.970	3.006	3.041	3.076	3.112	3.147
9	3.182	3.218	3.253	3.289	3.324	3.359	3.395	3.430	3.465	3.501
10	3.536	3.571	3.607	3.642	3.677	3.713	3.748	3.784	3.819	3.854
11	3.890	3.925	3.960	3.996	4.031	4.066	4.102	4.137	4.172	4.208
12	4.243	4.278	4.314	4.349	4.385	4.420	4.455	4.491	4.526	4.561
13	4.597	4.632	4.667	4.703	4.738	4.773	4.809	4.844	4.880	4.915
14	4.950	4.986	5.021	5.056	5.092	5.127	5.162	5.198	5.233	5.268
15	5.304	5.339	5.375	5.410	5.445	5.481	5.516	5.551	5.587	5.622
16	5.657	5.693	5.728	5.763	5.799	5.834	5.869	5.905	5.940	5.976
17	6.011	6.046	6.082	6.117	6.152	6.188	6.223	6.258	6.294	6.329
18	6.364	6.400	6.435	6.471	6.506	6.541	6.577	6.612	6.647	6.683
19	6.718	6.753	6.789	6.824	6.859	6.895	6.930	6.966	7.001	7.036
20	7.072	7.107	7.142	7.178	7.213	7.248	7.284	7.319	7.354	7.390
21	7.425	7.460	7.496	7.531	7.567	7.602	7.637	7.673	7.708	7.743
22	7.779	7.814	7.849	7.885	7.920	7.955	7.991	8.026	8.062	8.097
23	8.132	8.168	8.203	8.238	8.274	8.309	8.344	8.380	8.415	8.450
24	8.486	8.521	8.556	8.592	8.627	8.663	8.698	8.733	8.769	8.804
25	8.839	8.875	8.910	8.945	8.981	9.016	9.051	9.087	9.122	9.158
26	9.193	9.228	9.264	9.299	9.334	9.370	9.404	9.440	9.476	9.511
27	9.546	9.582	9.617	9.653	9.688	9.723	9.759	9.794	9.829	9.865
28	9.900	9.935	9.971	10.006	10.041	10.077	10.112	10.147	10.183	10.218
29	10.254	10.289	10.324	10.360	10.395	10.430	10.466	10.501	10.536	10.572
30	10.607	10.642	10.678	10.713	10.749	10.784	10.819	10.855	10.890	10.925
31	10.961	10.996	11.031	11.067	11.102	11.137	11.173	11.208	11.243	11.279
32	11.314	11.350	11.385	11.420	11.456	11.491	11.526	11.562	11.597	11.632
33	11.668	11.703	11.736	11.774	11.809	11.845	11.880	11.915	11.951	11.986
34	12.021	12.057	12.092	12.127	12.163	12.198	12.233	12.269	12.304	12.340
35	12.375	12.410	12.466	12.481	12.516	12.552	12.587	12.622	12.658	12.693
36	12.728	12.764	12.799	12.834	12.870	12.905	12.941	12.976	13.011	13.047
37	13.082	13.117	13.153	13.188	13.223	13.259	13.294	13.329	13.365	13.400
38	13.436	13.471	13.506	13.542	13.577	13.612	13.648	13.683	13.718	13.754
39	13.789	13.824	13.860	13.895	13.931	13.966	14.001	14.037	14.072	14.107
40	14.143	14.178	14.213	14.249	14.284	14.319	14.355	14.390	14.425	14.461
41	14.496	14.532	14.567	14.602	14.638	14.673	14.708	14.744	14.779	14.814
42	14.850	14.885	14.920	14.956	14.991	15.027	15.062	15.097	15.133	15.168
43	15.203	15.239	15.274	15.309	15.345	15.380	15.415	15.451	15.486	15.521
44	15.557	15.592	15.628	15.663	15.698	15.734	15.769	15.804	15.840	15.875
45	15.910	15.946	15.981	16.016	16.052	16.087	16.123	16.158	16.193	16.229
46	16.264	16.299	16.335	16.370	16.405	16.441	16.476	16.511	16.547	16.582
47	16.618	16.653	16.688	16.724	16.759	16.794	16.830	16.865	16.900	16.936
48	16.971	17.006	17.042	17.077	17.112	17.143	17.183	17.219	17.254	17.289
49	17.325	17.360	17.395	17.431	17.466	17.501	17.537	17.572	17.607	17.643
50	17.678	17.714	17.749	17.784	17.820	17.855	17.890	17.926	17.961	17.996
51	18.032	18.067	18.102	18.138	18.173	18.208	18.244	18.279	18.315	18.350
52	18.385	18.421	18.456	18.491	18.527	18.562	18.597	18.633	18.668	18.703
53	18.739	18.774	18.810	18.845	18.880	18.916	18.951	18.986	19.022	19.057
54	19.092	19.128	19.163	19.198	19.234	19.269	19.305	19.340	19.375	19.411
55	19.446	19.481	19.517	19.552	19.587	19.623	19.658	19.693	19.729	19.764
56	19.799	19.835	19.870	19.906	19.941	19.976	20.012	20.047	20.082	20.118
57	20.153	20.188	20.224	20.259	20.294	20.330	20.365	20.401	20.436	20.471
58	20.507	20.542	20.577	20.613	20.648	20.683	20.719	20.754	20.789	20.825
59	20.860	20.896	20.931	20.966	21.002	21.037	21.072	21.108	21.143	21.178
60	21.214	21.249	21.284	21.320	21.355	21.390	21.426	21.461	21.497	21.532

*metres

Horizontal Limiting Distance* for Trees of a Given Diameter
Basal Area Factor 3.0

Diameter cm	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0	0.001	0.029	0.058	0.087	0.116	0.145	0.174	0.203	0.231	0.260
1	0.289	0.318	0.347	0.376	0.405	0.434	0.463	0.491	0.520	0.549
2	0.578	0.607	0.636	0.664	0.693	0.722	0.751	0.780	0.809	0.838
3	0.867	0.895	0.924	0.953	0.982	1.011	1.040	1.069	1.097	1.126
4	1.155	1.184	1.213	1.242	1.271	1.300	1.328	1.357	1.386	1.415
5	1.444	1.473	1.502	1.530	1.559	1.588	1.617	1.646	1.675	1.704
6	1.733	1.741	1.790	1.819	1.848	1.877	1.906	1.935	1.963	1.992
7	2.021	2.050	2.079	2.108	2.137	2.166	2.194	2.223	2.252	2.281
8	2.310	2.339	2.368	2.397	2.425	2.454	2.483	2.512	2.541	2.570
9	2.599	2.627	2.656	2.685	2.714	2.743	2.772	2.801	2.830	2.858
10	2.887	2.916	2.945	2.974	3.003	3.032	3.060	3.089	3.118	3.147
11	3.176	3.205	3.234	3.263	3.291	3.320	3.349	3.378	3.407	3.436
12	3.465	3.493	3.522	3.551	3.580	3.609	3.638	3.667	3.696	3.724
13	3.753	3.782	3.811	3.840	3.869	3.898	3.926	3.955	3.984	4.013
14	4.042	4.071	4.100	4.129	4.157	4.186	4.215	4.244	4.273	4.302
15	4.331	4.359	4.388	4.417	4.446	4.475	4.504	4.533	4.562	4.590
16	4.619	4.648	4.677	4.706	4.735	4.764	4.793	4.821	4.850	4.879
17	4.908	4.937	4.966	4.995	5.023	5.052	5.081	5.110	5.139	5.168
18	5.197	5.226	5.254	5.283	5.312	5.341	5.370	5.399	5.428	5.456
19	5.485	5.514	5.543	5.572	5.601	5.630	5.659	5.687	5.716	5.745
20	5.774	5.803	5.832	5.861	5.889	5.918	5.947	5.976	6.005	6.034
21	6.063	6.092	6.120	6.149	6.178	6.207	6.236	6.265	6.294	6.322
22	6.351	6.380	6.409	6.438	6.467	6.496	6.525	6.553	6.582	6.611
23	6.640	6.669	6.698	6.727	6.755	6.784	6.813	6.842	6.871	6.900
24	6.929	6.956	6.986	7.015	7.044	7.073	7.102	7.131	7.160	7.189
25	7.217	7.246	7.275	7.304	7.333	7.362	7.391	7.419	7.448	7.477
26	7.506	7.535	7.564	7.593	7.622	7.650	7.679	7.708	7.737	7.766
27	7.795	7.824	7.852	7.881	7.910	7.939	7.968	7.997	8.026	8.055
28	8.083	8.112	8.141	8.170	8.199	8.228	8.257	8.285	8.314	8.343
29	8.372	8.401	8.430	8.459	8.488	8.516	8.545	8.574	8.603	8.632
30	8.661	8.690	8.718	8.747	8.776	8.805	8.834	8.863	8.892	8.921
31	8.949	8.976	9.007	9.036	9.065	9.094	9.123	9.152	9.180	9.209
32	9.238	9.267	9.296	9.325	9.354	9.382	9.411	9.440	9.469	9.498
33	9.527	9.556	9.585	9.613	9.642	9.671	9.700	9.729	9.758	9.787
34	9.815	9.844	9.873	9.902	9.931	9.960	9.989	10.018	10.046	10.075
35	10.104	10.123	10.162	10.191	10.220	10.248	10.277	10.306	10.335	10.364
36	10.393	10.422	10.451	10.479	10.508	10.537	10.566	10.595	10.624	10.653
37	10.681	10.710	10.739	10.768	10.797	10.826	10.855	10.884	10.912	10.941
38	10.970	10.998	11.028	11.057	11.086	11.114	11.143	11.172	11.201	11.230
39	11.259	11.288	11.317	11.345	11.374	11.403	11.432	11.461	11.498	11.519
40	11.548	11.576	11.605	11.634	11.663	11.692	11.721	11.750	11.778	11.807
41	11.836	11.865	11.894	11.923	11.952	11.981	12.009	12.038	12.067	12.096
42	12.125	12.154	12.183	12.211	12.240	12.269	12.298	12.327	12.356	12.385
43	12.414	12.442	12.471	12.500	12.529	12.558	12.587	12.616	12.644	12.673
44	12.702	12.731	12.760	12.789	12.818	12.847	12.875	12.904	12.933	12.962
45	12.991	13.020	13.049	13.077	13.106	13.135	13.164	13.193	13.222	13.251
46	13.280	13.308	13.337	13.366	13.395	13.424	13.453	13.482	13.510	13.539
47	13.568	13.597	13.626	13.655	13.684	13.713	13.741	13.770	13.799	13.828
48	13.857	13.886	13.915	13.944	13.972	14.001	14.030	14.059	14.088	14.117
49	14.146	14.174	14.203	14.232	14.261	14.290	14.319	14.348	14.377	14.405
50	14.434	14.463	14.492	14.521	14.550	14.579	14.607	14.636	14.665	14.694
51	14.723	14.752	14.781	14.810	14.838	14.867	14.896	14.925	14.954	14.983
52	15.012	15.040	15.069	15.098	15.127	15.156	15.185	15.214	15.243	15.271
53	15.300	15.329	15.358	15.387	15.416	15.445	15.473	15.502	15.531	15.560
54	15.589	15.618	15.647	15.676	15.704	15.733	15.762	15.791	15.820	15.849
55	15.878	15.906	15.935	15.964	15.993	16.022	16.051	16.080	16.109	16.137
56	16.166	16.195	16.224	16.253	16.282	16.311	16.340	16.368	16.397	16.426
57	16.455	16.484	16.513	16.542	16.570	16.599	16.628	16.657	16.686	16.715
58	16.744	16.773	16.801	16.830	16.859	16.888	16.917	16.946	16.975	17.003
59	17.032	17.061	17.090	17.119	17.148	17.177	17.206	17.234	17.263	17.292
60	17.321	17.350	17.379	17.408	17.436	17.465	17.494	17.523	17.552	17.581

metres

Provisional Fertilizer Recommendations for Balsam Fir from Foliar Analysis

FOR STANDS OVER 2 FEET IN HEIGHT
(apply around drip line)

	N Less than (<) 1.6%			N 1.6% – 2.0%			N Greater than (>) 2.0%		
	P/N < 0.08	P/N 0.08 - 0.1	P/N > 0.1	P/N < 0.08	P/N 0.08 - 0.1	P/N > 0.1	P/N < 0.08	P/N 0.08 - 0.1	P/N > 0.1
K/N < 0.3	17 - 17 - 17 8 oz.	17 - 17 - 17 8 oz.	34 - 0 - 0 4 oz. + 0 - 0 - 61 4 oz.	17 - 17 - 17 4 oz.	17 - 17 - 17 4 oz.	34 - 0 - 0 2 oz. + 0 - 0 - 61 4 oz.	0 - 50 - 0 4 oz. + 0 - 0 - 61 4 oz.	0 - 50 - 0 2 oz. + 0 - 0 - 61 4 oz.	0 - 0 - 61 4 oz.
K/N 0.3 - 0.35	17 - 17 - 17 8 oz.	17 - 17 - 17 8 oz.	20 - 5 - 5 6 oz.	17 - 17 - 17 4 oz.	17 - 17 - 17 4 oz.	20 - 5 - 5 3 oz.	0 - 50 - 0 4 oz. + 0 - 0 - 61 2 oz.	0 - 50 - 0 2 oz. + 0 - 0 - 61 2 oz.	0 - 0 - 61 2 oz.
K/N > 0.35	34 - 0 - 0 4 oz. + 0 - 50 - 0 4 oz.	34 - 0 - 0 4 oz. + 0 - 50 - 0 2 oz.	20 - 5 - 5 6 oz.	34 - 0 - 0 2 oz. + 0 - 50 - 0 4 oz.	34 - 0 - 0 2 oz. + 0 - 50 - 0 2 oz.	20 - 5 - 5 3 oz.	0 - 50 - 0 4 oz.	0 - 50 - 0 2 oz.	NOT RECOMMENDED

Note: Where fertilizer recommendations do not specify any Nitrogen (N), 5% could be added.

FOR STANDS UNDER 2 FEET IN HEIGHT
(apply in a band 6 inches from stem)

17 - 17 - 17 2 oz.	or	10 - 10 - 10 3 oz.

EXAMPLE

From Foliar Tissue Analysis Report

N = 1.65%

P = 0.19%

K = 0.81%

Calculate:

P/N = 0.19 / 1.65 = 0.12

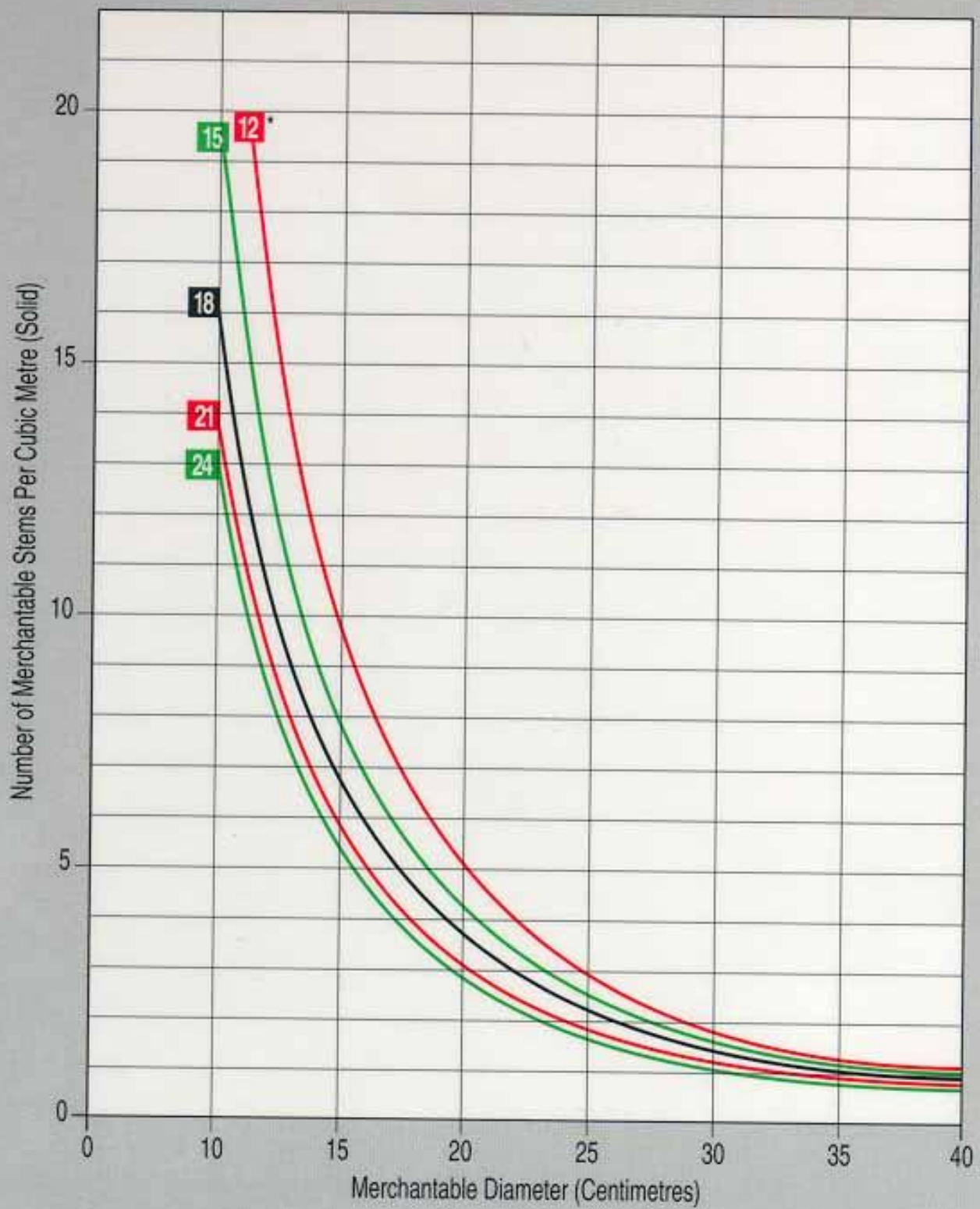
K/N = 0.81 / 1.65 = 0.49

Recommendation from Table above is:

3 oz. of 20 - 5 - 5 per tree

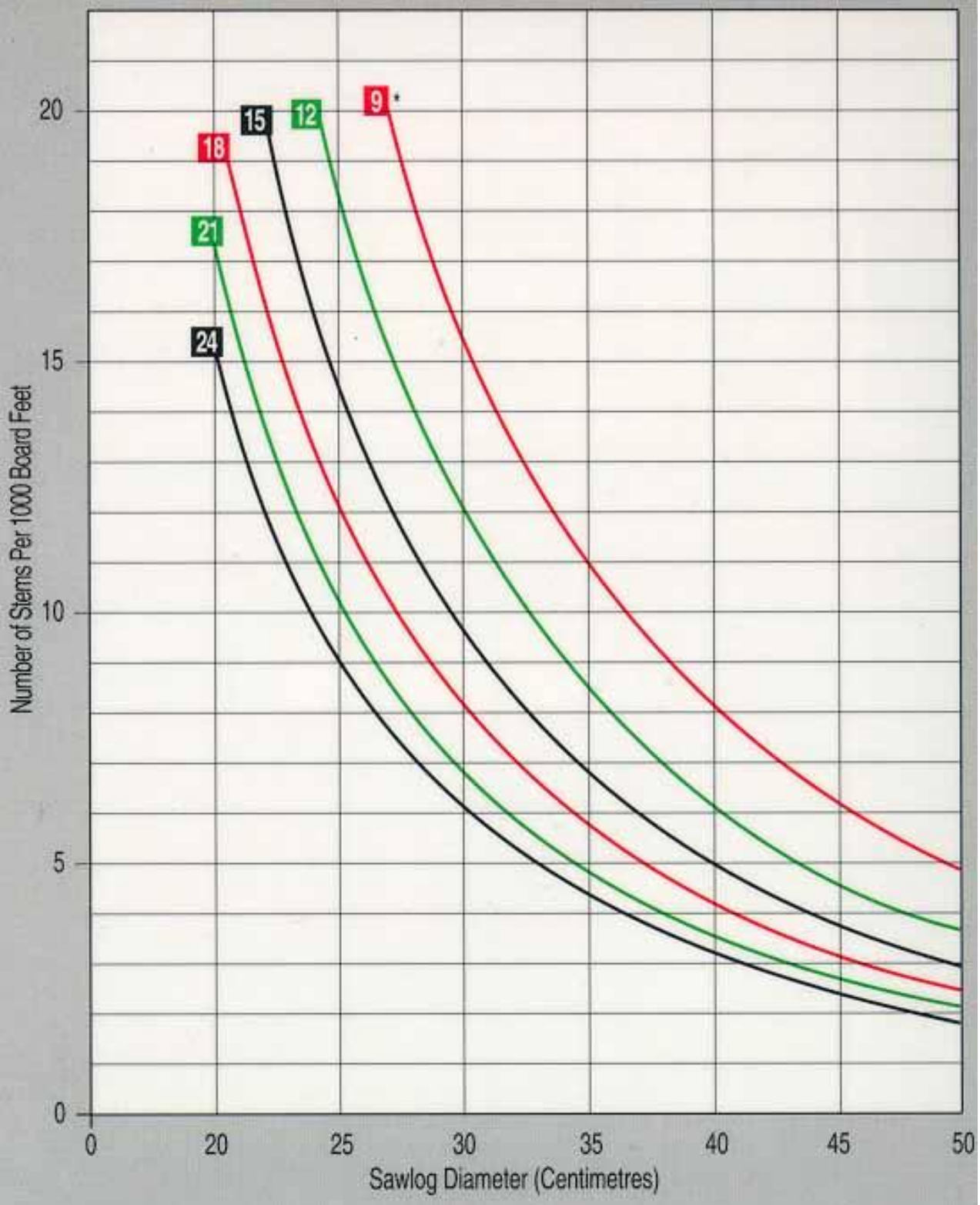
Note: All recommendations are in ounces of product per tree
To determine pounds per acre, multiply ounces per tree by 1000 and divide by 16.

Number of Stems Per Cubic Metre By Stand Height and Diameter



* Average stand height (metres)

Number of Stems Per 1000 Board Feet By Stand Height and Diameter



* Average stand height (metres)

Factors for Converting Yard/Pound Units to Metric (SI) Units

Length
inches x 2.54 = cm
feet x 0.304 8 = m
yards x 0.914 4 = m
chains x 20.116 8 = m
miles x 1.609 34 = km

Area
square inches x 6.451 6 = cm^2
square feet x 0.092 903 0 = m^2
square yards x 0.836 127 = m^2
mil-acre x 4.046 86 = m^2
acres x 0.404 686 = ha
square miles x 2.589 99 = km^2

Volume Capacity
cubic feet x 0.028 316 8 = m^3
gallons x 4.546 09 = L
cubic yards x 0.764 555 = m^3
cords x 3.624 56 = m^3 (stacked)
cunits x 2.831 68 = m^3
cords (8 ft. Swd) x 2.208 712 = m^3
cords (4 ft. Swd) x 2.406 37 = m^3
cords (8 ft. Hwd) x 1.982 177 = m^3
cords (Mxd. Inventory) x 2.152 078 = m^3
fbm x 0.00564972 = m^3 (logs)

Mass (Weight)
ounces x 28.349 5 = g
pounds x 0.453 592 = kg
tonnes x 0.907 185 = tonnes

Ratios
cords per acre x 8.956 47 = m^3 (stacked)/ha
cords per acre (8 ft. Swd) x 5.457 838 = m^3/ha
cords per acre (4 ft. Swd) x 5.947 672 = m^3/ha
cords per acre (8 ft. Hwd) x 4.898 058 = m^3/ha
cords per acre (Mxd. Inventory) x 5.317 892 = m^3/ha
fbm per acre x 0.013 960 7 = m^3/ha (logs)
fbm per acre x 0.005 830 9 = m^3/ha (lumber)
square feet per acre x 0.229 568 = m^2/ha
cubic feet per acre x 0.069 972 = m^3/ha
tons per acre x 2.241 70 = t/ha
pounds per acre x 1.120 85 = kg/ha
Imp. gallons per acre x 11.233 32 = L/ha
miles per gallon x 0.354 006 = km/L

Map Ratios
1:10 000 1 inch = 12.63 chains
1:15 840 1 inch = 20.00 chains
1:25 000 1 inch = 31.57 chains
1:50 000 1 inch = 63.13 chains

Factors for Converting Metric (SI) Units to Canadian Yard/Pound Units

Length
cm x 0.393 701 = inches
m x 3.280 84 = feet
m x 1.093 61 = yards
m x 0.049 709 7 = chains
km x 1.093 61 = yards

Area
cm^2 x 0.155 000 = square inches
m^2 x 10.763 9 = square feet
m^2 x 1.195 99 = square yards
m^2 x 0.247 105 = mil-acre
ha x 2.471 05 = acres
km^2 x 0.386 102 = square miles

Volume or Capacity
m^3 x 35.314 7 = cubic feet
L x 0.219 969 = gallons
m^3 x 1.307 95 = cubic yards
m^3 (stacked) x 0.275 896 = cords
m^3 x 0.353 147 = cunits
m^3 (2.44 m - swd) x 0.452 753 = cords
m^3 (1.22 m - swd) x 0.415 460 = cords
m^3 (2.44 m - hwd) x 0.504 496 = cords
m^3 (Mxd. Inventory) x 0.464 667 = cords
m^3(logs) x 177 = fbm

Mass (Weight)
g x 0.035 274 0 = ounces
kg x 2.204 62 = pounds
tonnes x 1.1023 1 = tonnes

Ratios
m^3 (stacked)/ha x 0.111 651 = cords per acre
m^3/ha (2.44 m-Swd) x 0.183 223 = cords per acre
m^3/ha (1.22 m-Swd) x 0.168 133 = cords per acre
m^3/ha (2.44 m-Hwd) x 0.204 163 = cords per acre
m^3/ha (Mxd. Inventory) x 0.188 044 = cords per acre
m^3/ha (logs) x 71.629 5 = fbm per acre
m^3/ha (lumber) x 171.5 = fbm per acre
m^2/ha x 4.356 00 = square feet per acre
m^3/ha x 14.291 3 = cubic feet per acre
t/ha x 0.446 090 = tons per acre
kg/ha x 0.892 180 = pounds per acre
L/ha x 0.089 020 8 = Imp. gallons per acre
km/L x 2.824 81 = miles per gallon

Map Ratios
1:10 000 1 cm = 100 m = 0.1 km
1:15 840 1 cm = 158.4 m = 0.16 km
1:25 000 1 cm = 250 m = 0.25 km
1:50 000 1 cm = 500 m = 0.5 km