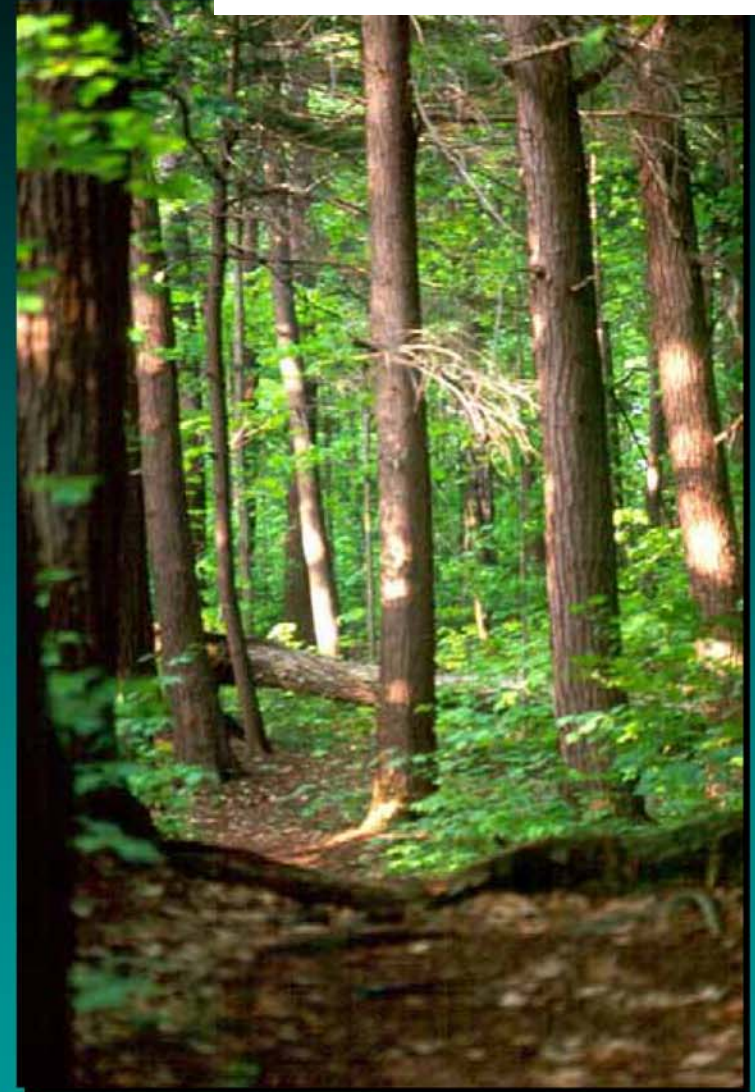


Vegetation Management:

What it means and why it is important for conifer production



Dr. Doug Pitt



Natural Resources Canada
Canadian Forest Service

Ressources naturelles Canada
Service canadien des forêts

Canada 



Weed = any plant growing where it is not wanted



Vegetation management is the art and science of manipulating sunlight, soil moisture, and nutrients to achieve a forest with the desired species composition and structure, within a specified period of time.



A photograph of a young evergreen tree in a forest. The tree is the central focus, with its branches and needles clearly visible. The background shows a dense forest of similar trees, extending to the horizon under a bright sky. The text is overlaid on the bottom left of the image.

... like our home garden, we need to protect establishment investments and guarantee that objectives are met by managing competing vegetation. Vegetation management removes much of the risk from planned forest renewal...

Effects are positive and long-lasting...

The effects of vegetation management on conifer production are positive and long-lasting;

Its not as simple as untended trees eventually catching up...



Effects are positive and long-lasting...

18-year old plantation...



JDI, Black Brook

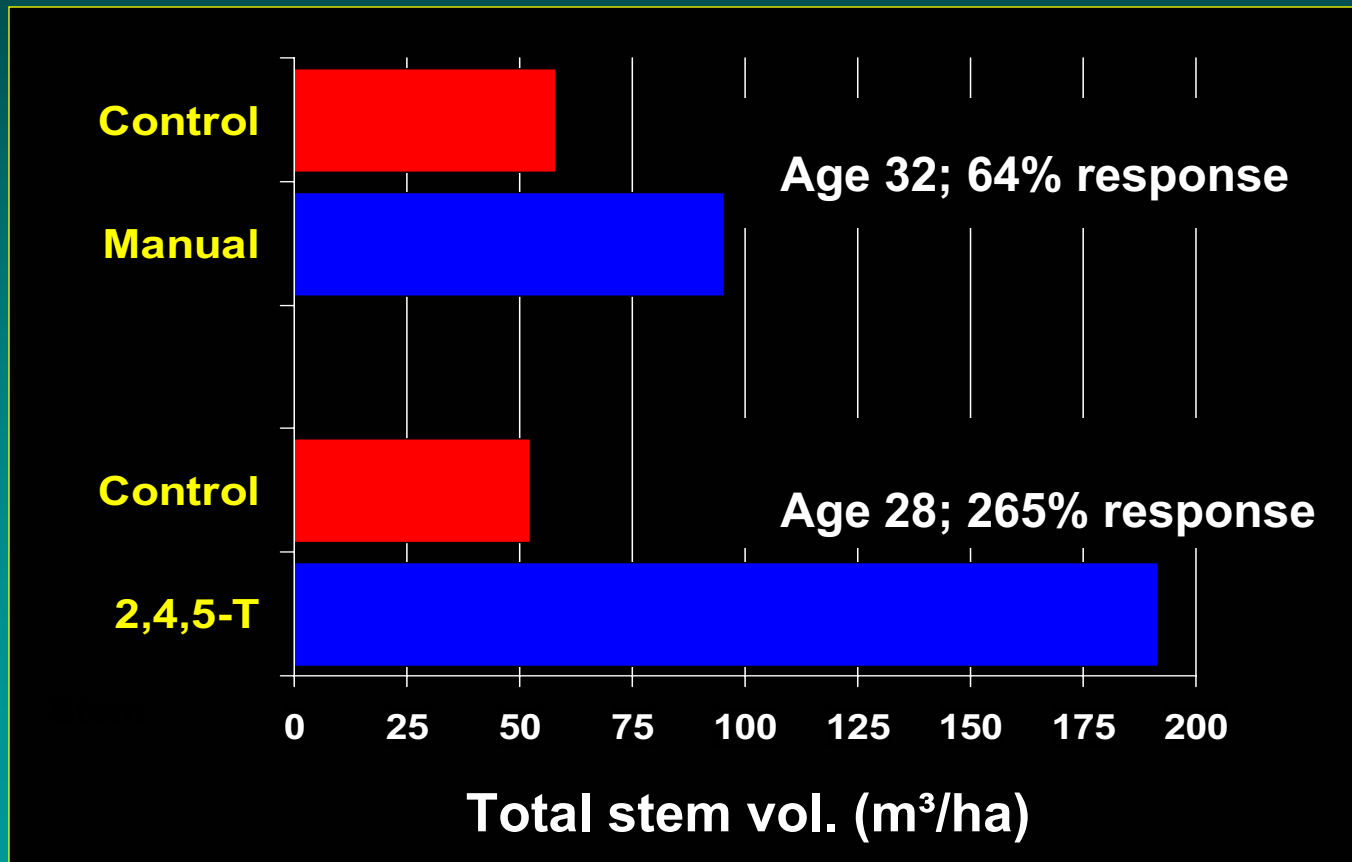
Effects are positive and long-lasting...

- ➔ Maclean & Morgan. 1983. *For. Chron.* (Aug):177-183
- ➔ Balsam fir, manually released from brush, 1-m radius, or broadcast released with 2, 4, 5-T; ages 32 and 28, respectively.



Effects are positive and long-lasting...

➔ Maclean & Morgan. 1983. *For. Chron.* (Aug):177-183



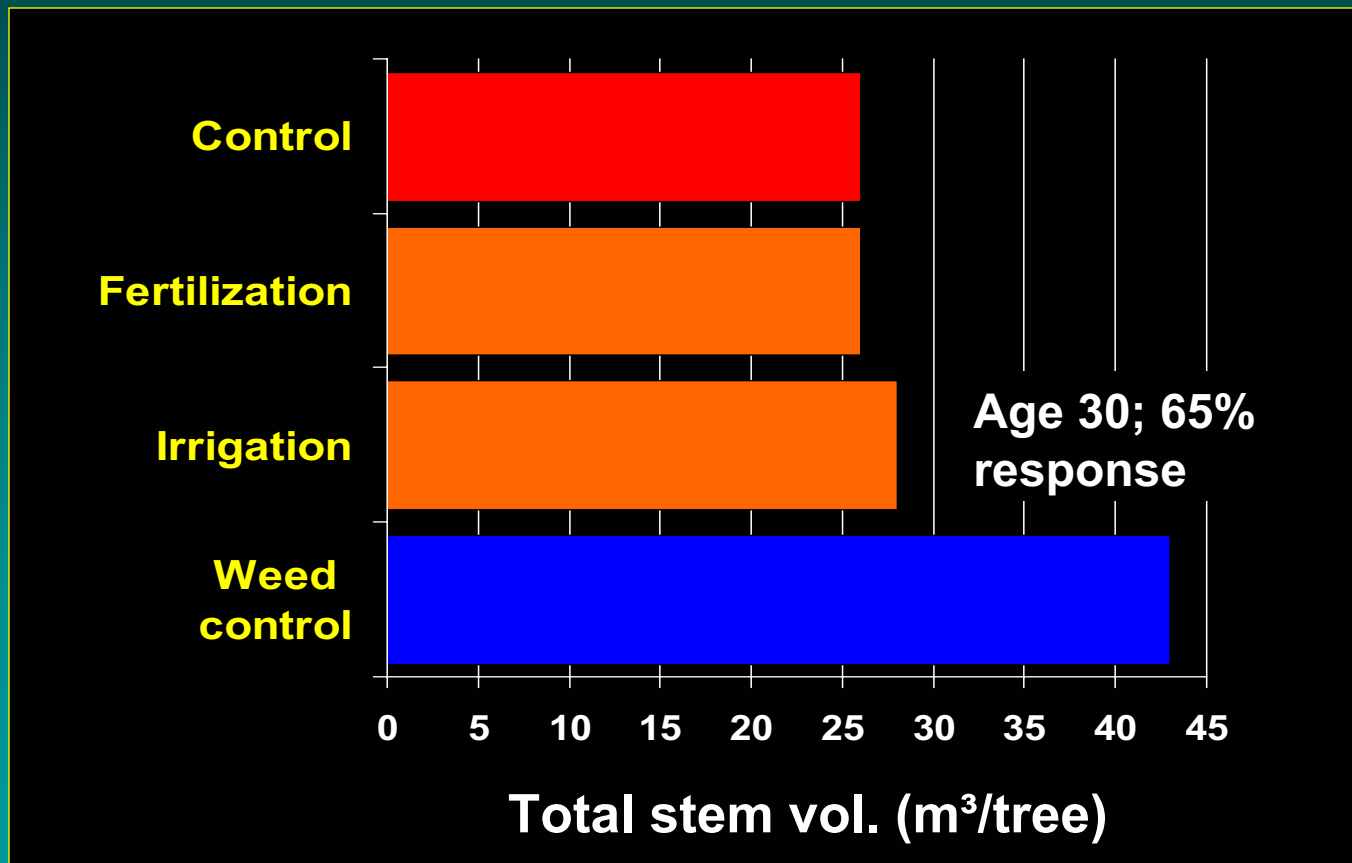
Effects are positive and long-lasting...

- ➔ Sutton. 1995. *New Forests* 9: 123-133.
- ➔ White spruce, maintained weed-free for 2 growing seasons. Also tested 2 years of fertilization and irrigation.



Effects are positive and long-lasting...

➔ Sutton. 1995. *New Forests* 9: 123-133.



Results are proportional to intensity...



As vegetation management intensity/rigor increases, so will the abundance and dominance of conifer in the result...

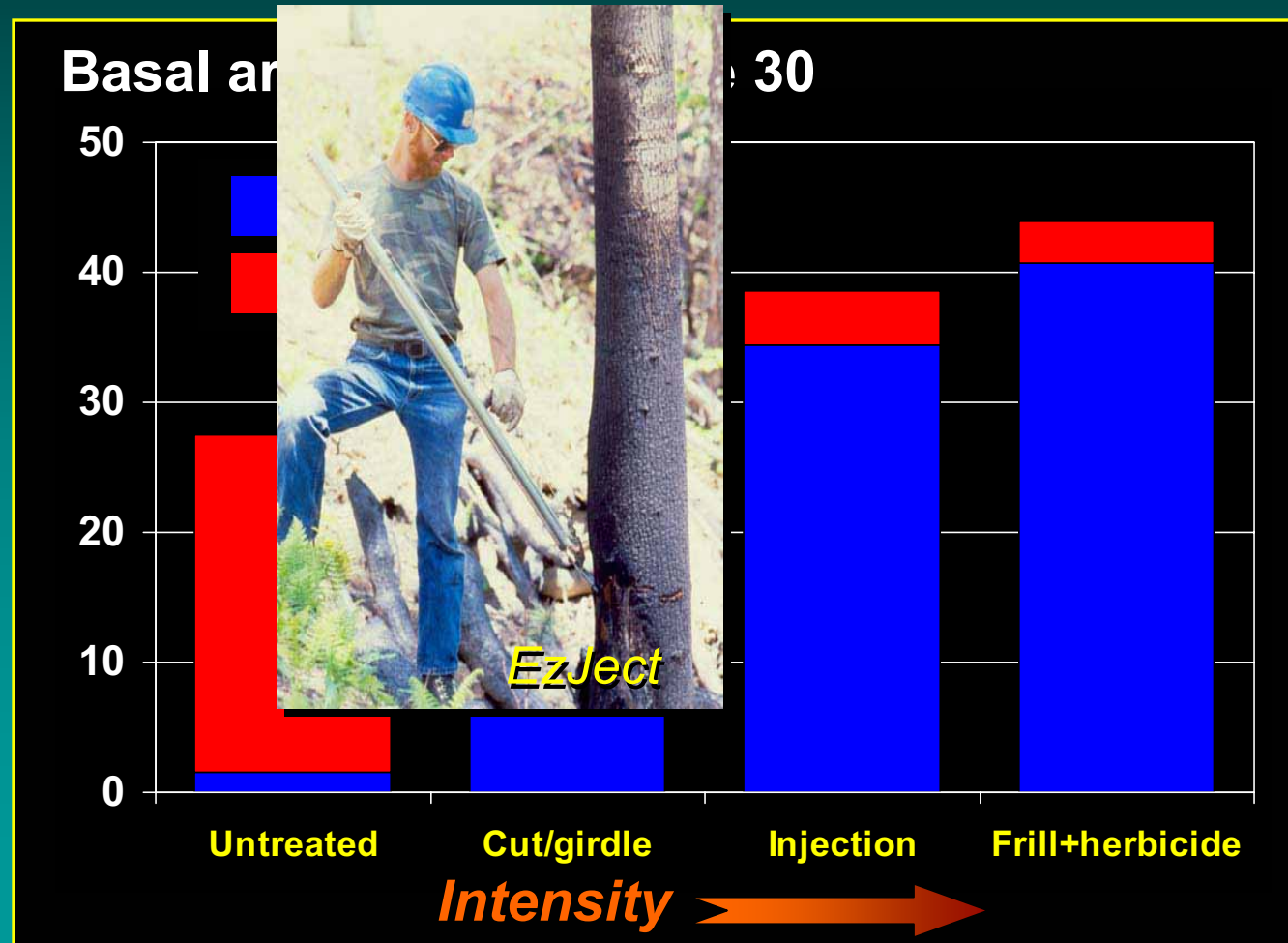
Results are proportional to intensity...

- ➔ **Glover & Zutter. 1993. *Can. J. For. Res.* 23: 2126-2132.**
- ➔ **Loblolly pine, released from woody competition by a number of site prep treatments.**



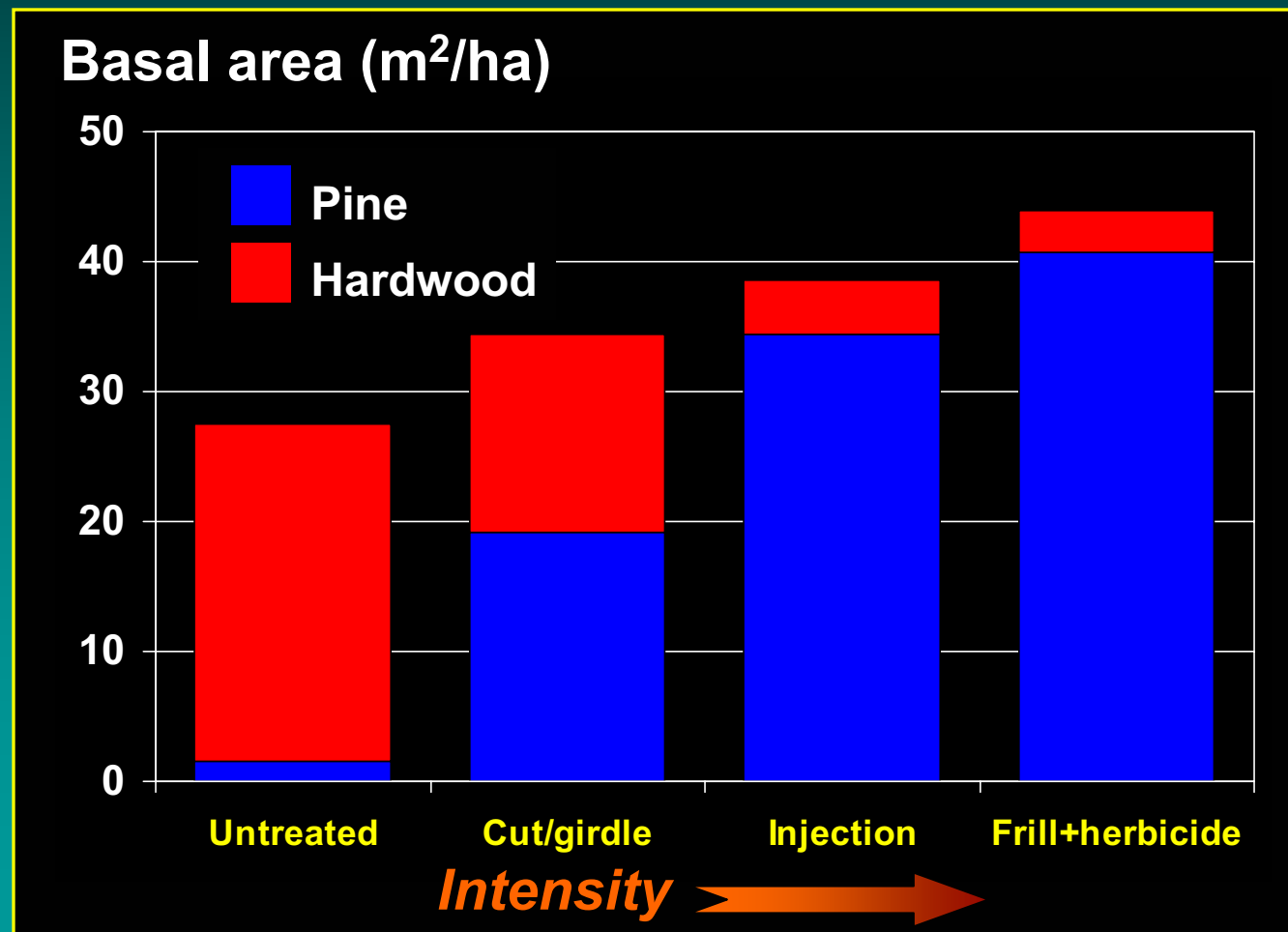
Results are proportional to intensity...

➔ Glover & Zutter. 1993. *Can. J. For. Res.* 23: 2126-2132.



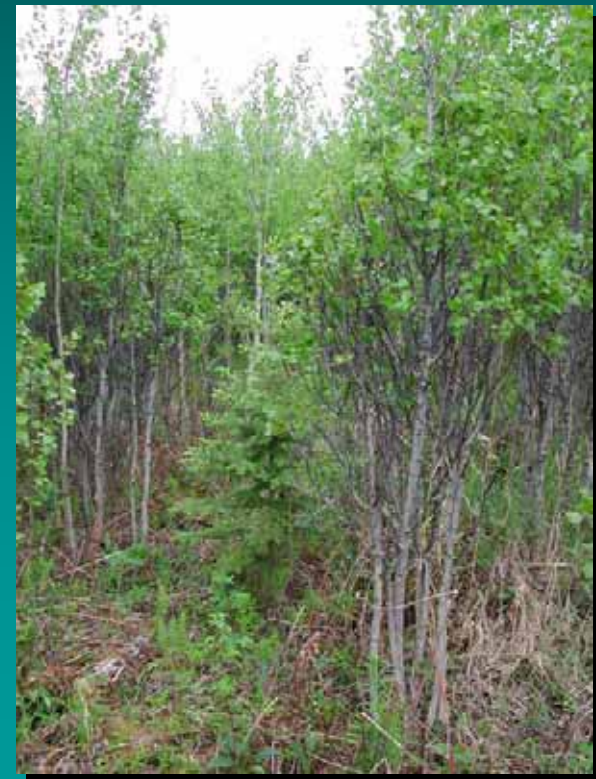
Results are proportional to intensity...

➔ Glover & Zutter. 1993. *Can. J. For. Res.* 23: 2126-2132.



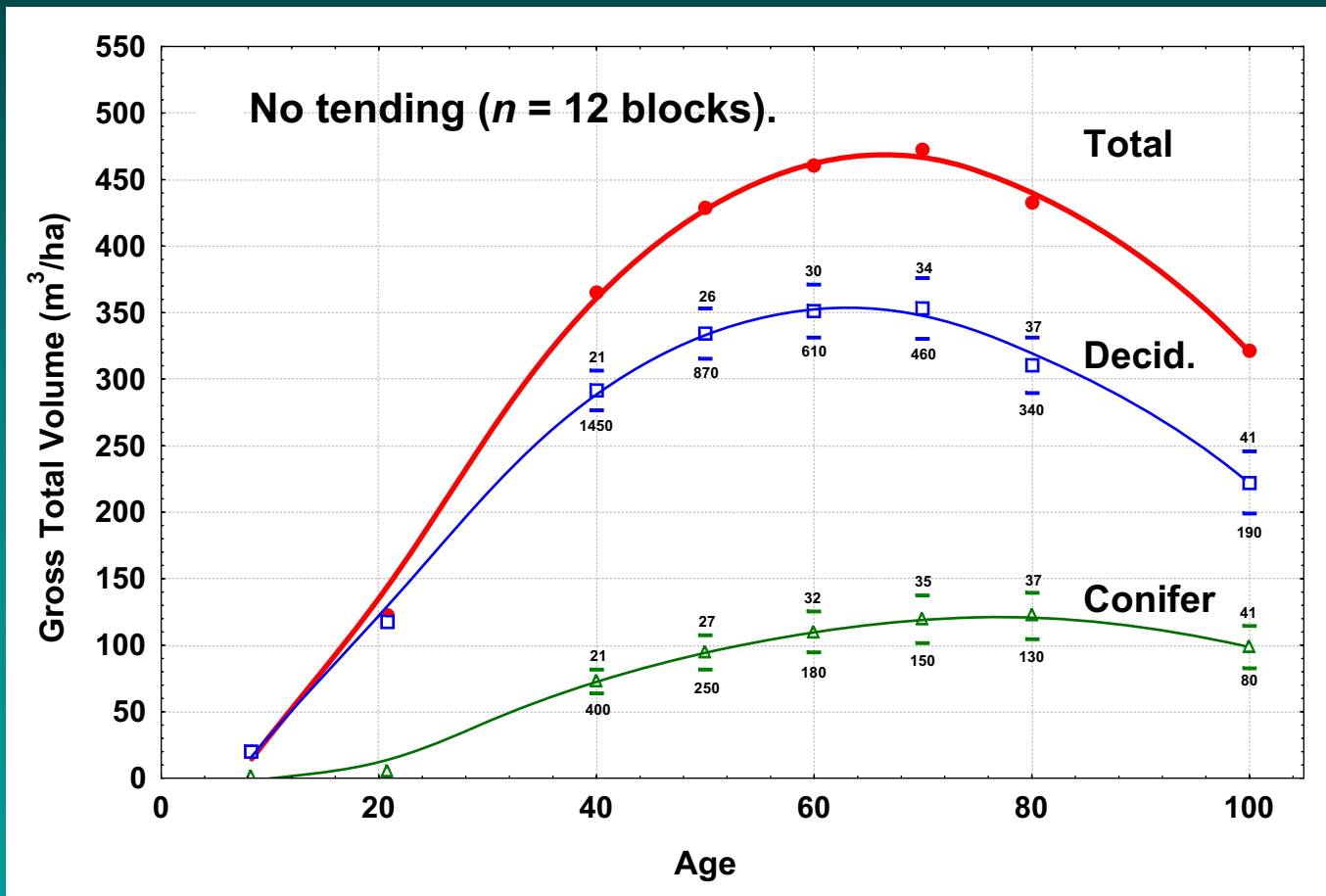
Results are proportional to intensity...

- ➔ Pitt, Mihajlovich, & Proudfoot. 2004. *For. Chron.* 80: 583-597.
- ➔ 12 AB white spruce plantations surveyed at ave. age 8. Typical boreal mixedwood sites...



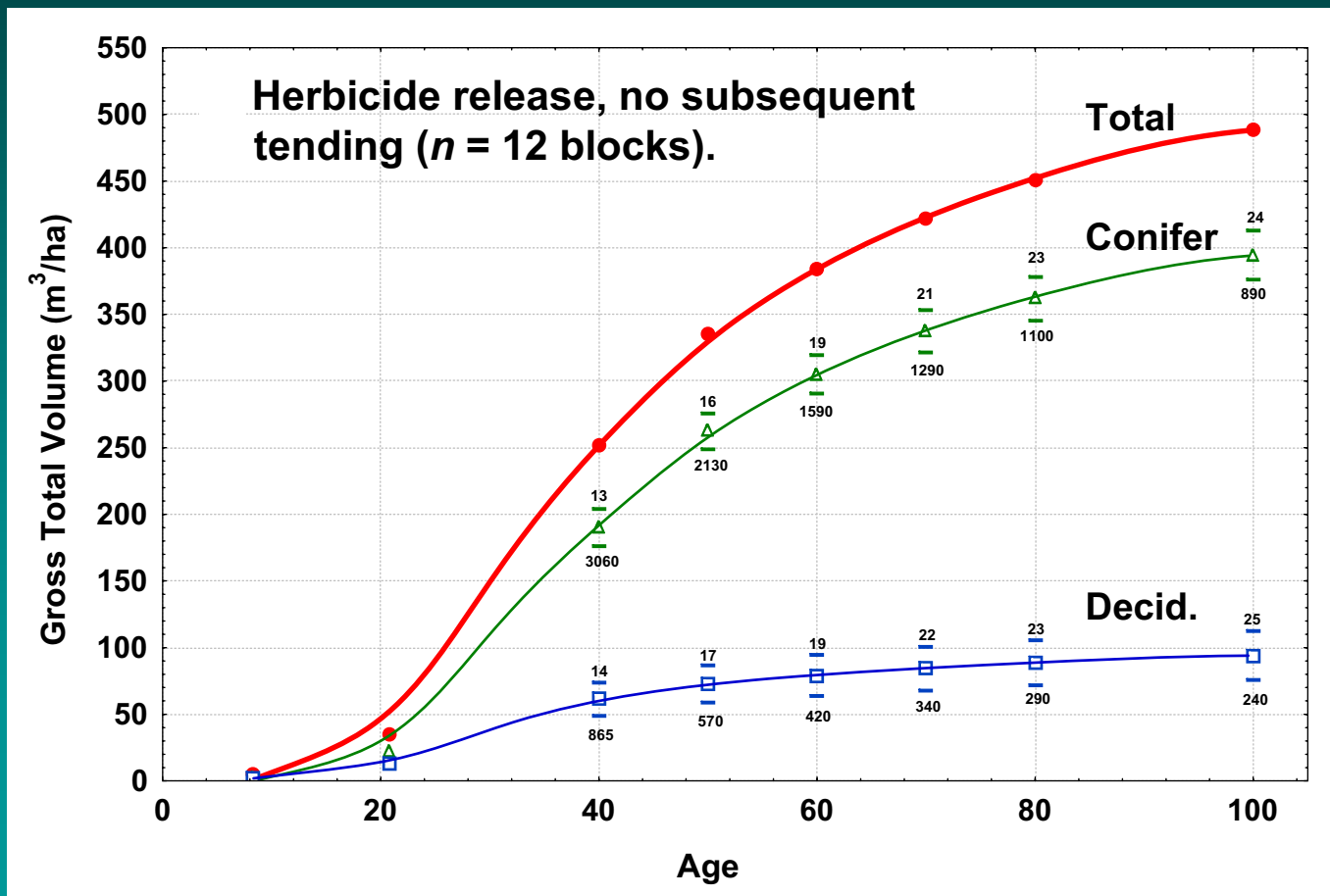
Results are proportional to intensity...

➔ Pitt, Mihajlovich, & Proudfoot. 2004. *For. Chron.* 80: 583-597.



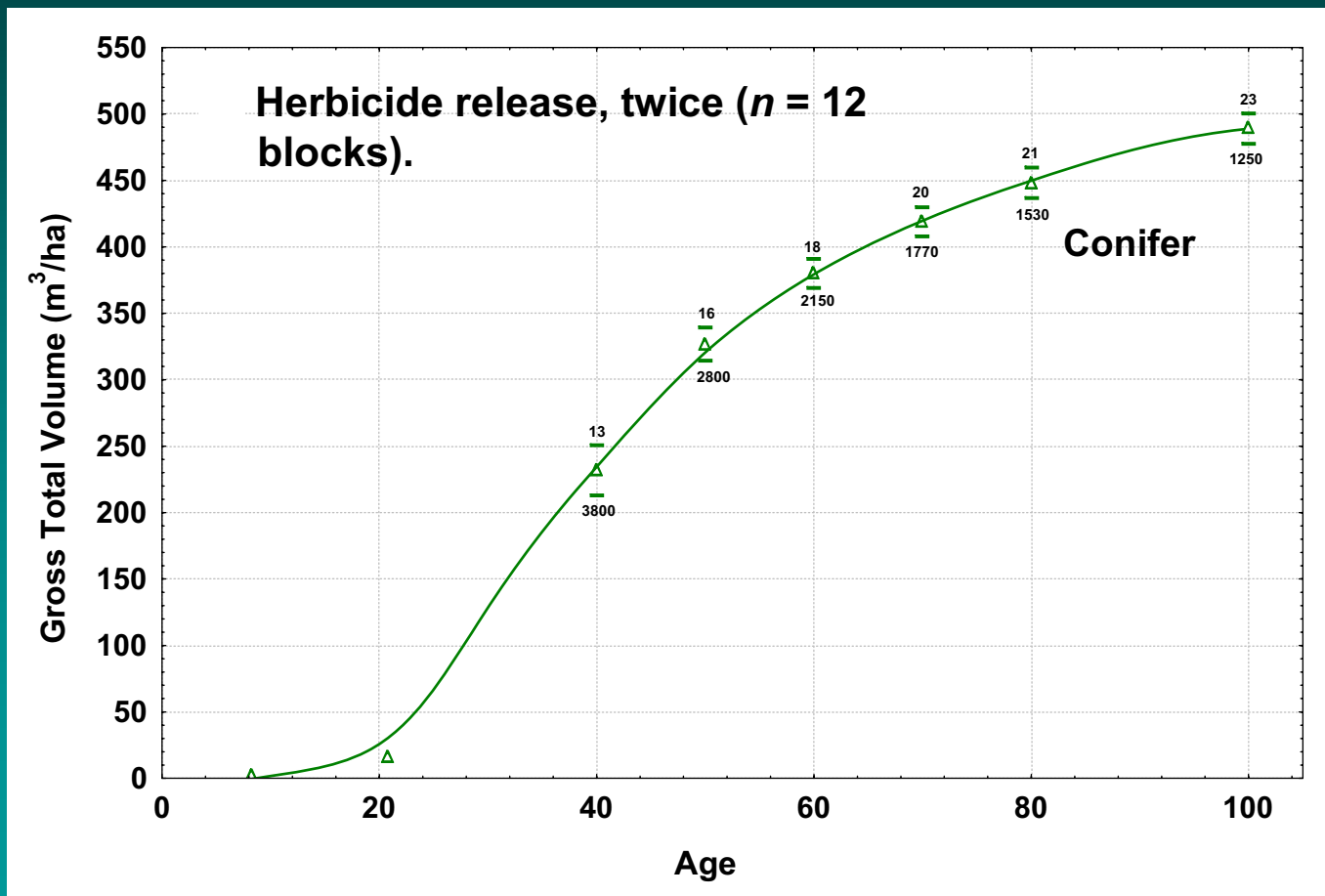
Results are proportional to intensity...

➔ Pitt, Mihajlovich, & Proudfoot. 2004. *For. Chron.* 80: 583-597.



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Results are proportional to intensity...

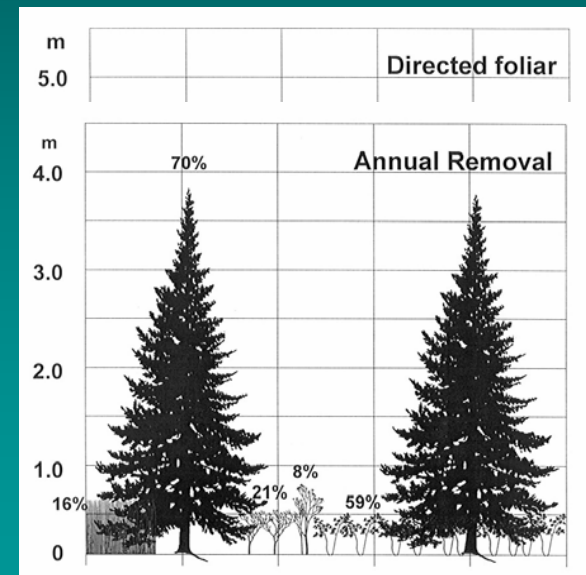
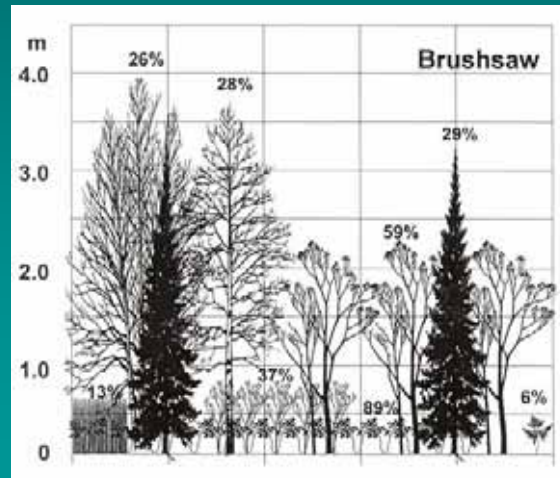
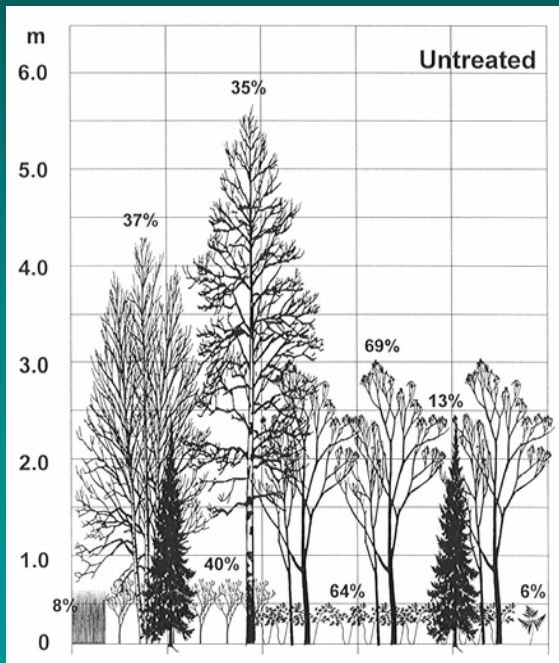
- ➔ Pitt, Wagner, & Towill. 2004. *N.J.A.F.* 21: 123-134.
- ➔ Black spruce, age 12, 10 years after treatment with a range of intensities.



Results are proportional to intensity...

➔ Pitt, Wagner, & Towill. 2004. *N.J.A.F.* 21: 123-134.

OMNR source data:



Intensity ➔

Early action is critical...

If you wait to see if you have a competition problem before acting, you're too late...



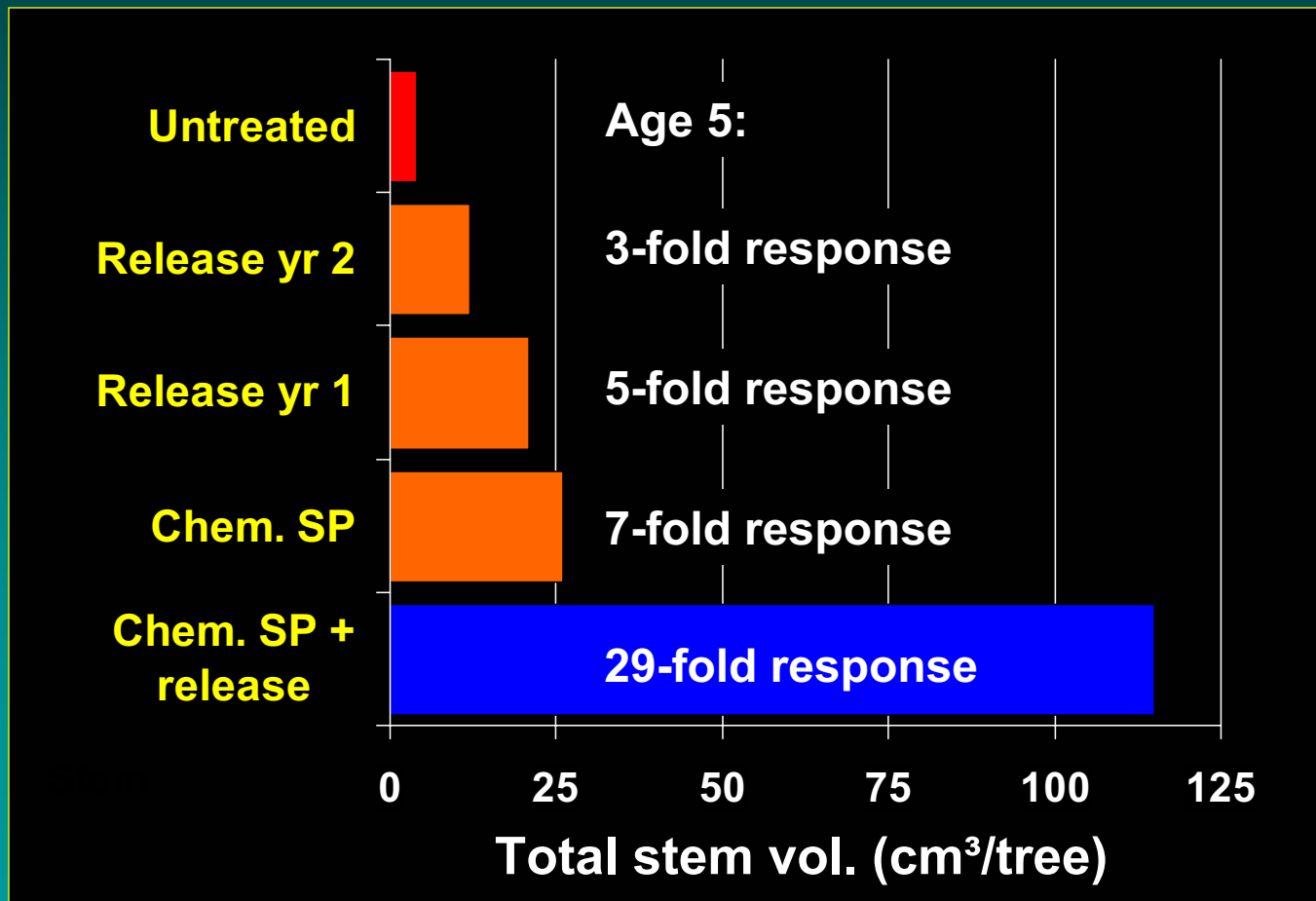
Early action is critical...

- ➔ **Wood & von Althen. 1993. *For. Chron.* 69: 554-560.**
- ➔ **Black spruce, fine-textured boreal mixedwood site, 5 years after different site prep. and release treatments.**



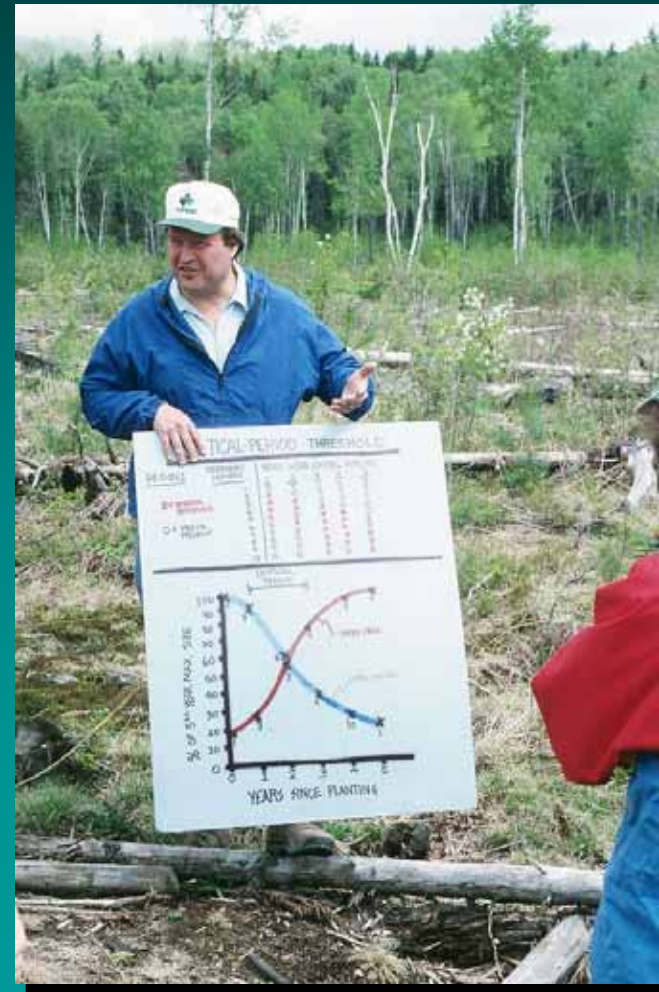
Early action is critical...

➔ Wood & von Althen. 1993. *For. Chron.* 69: 554-560.



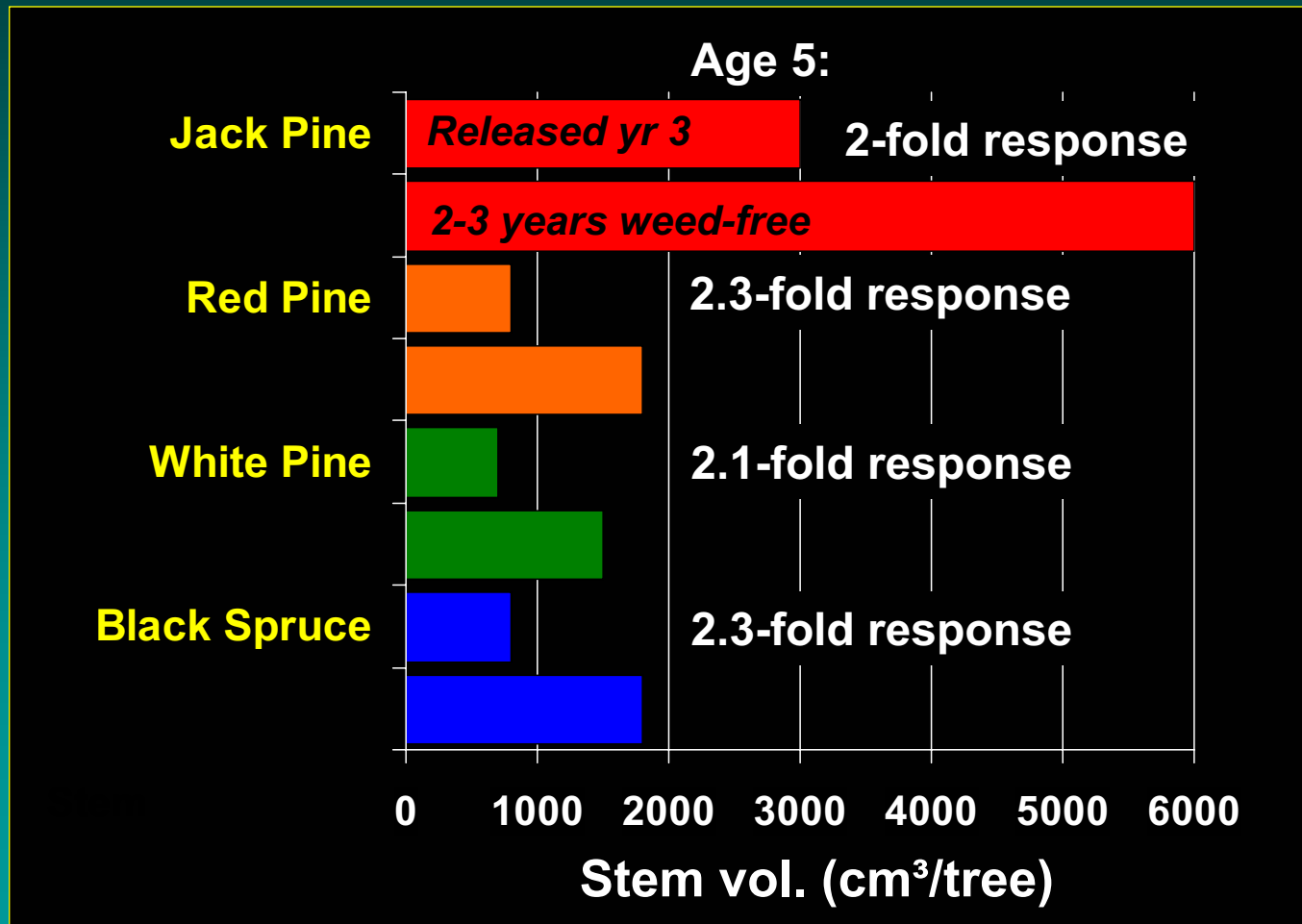
Early action is critical...

- ➔ **Wagner *et al.* 1999. *Can. J. For. Res.* 29: 890-897.**
- ➔ **Jack pine, red pine, white pine, black spruce; duration of early weed control vs. timing of release; thresholds of competition.**



Early action is critical...

➔ Wagner et al. 1999. *Can. J. For. Res.* 29: 890-897



Herbaceous weed control is critical...

Foresters often ignore herbaceous competition, assuming that their conifers will eventually “break free”.



Herbaceous weed control is critical...

➔ Pitt *et al.* 2005. www.forestresearch.ca, RP-31.



**Ontario white pine
restoration site**

Herbaceous weed control is critical...

➔ Pitt et al



Herbaceous weed control is critical...

➔ Pitt et al. 2005. www.forestresearch.ca, RP-31.

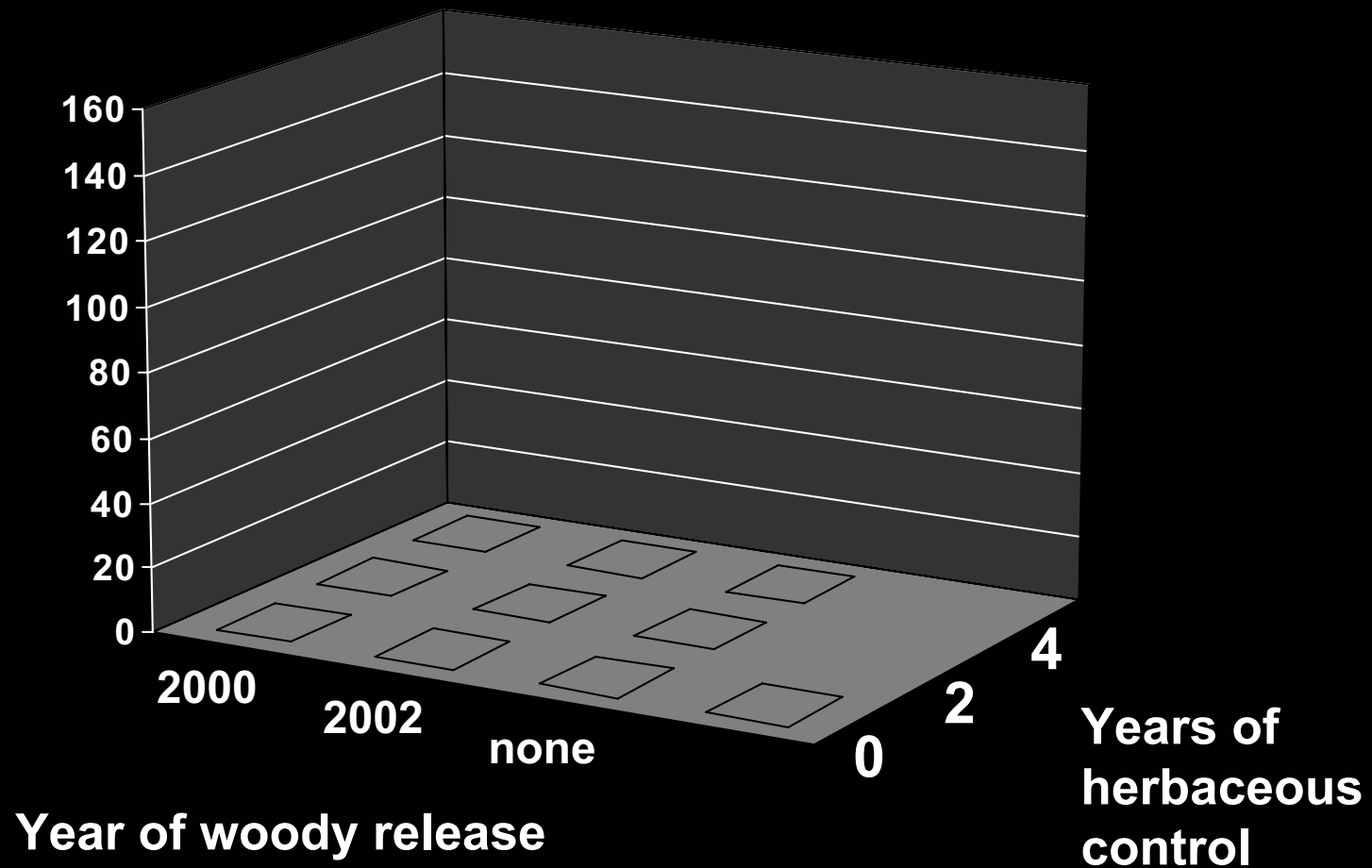


100% cover!

Herbaceous weed control is critical...

➔ Pitt et al. 2005. www.forestresearch.ca, RP-31.

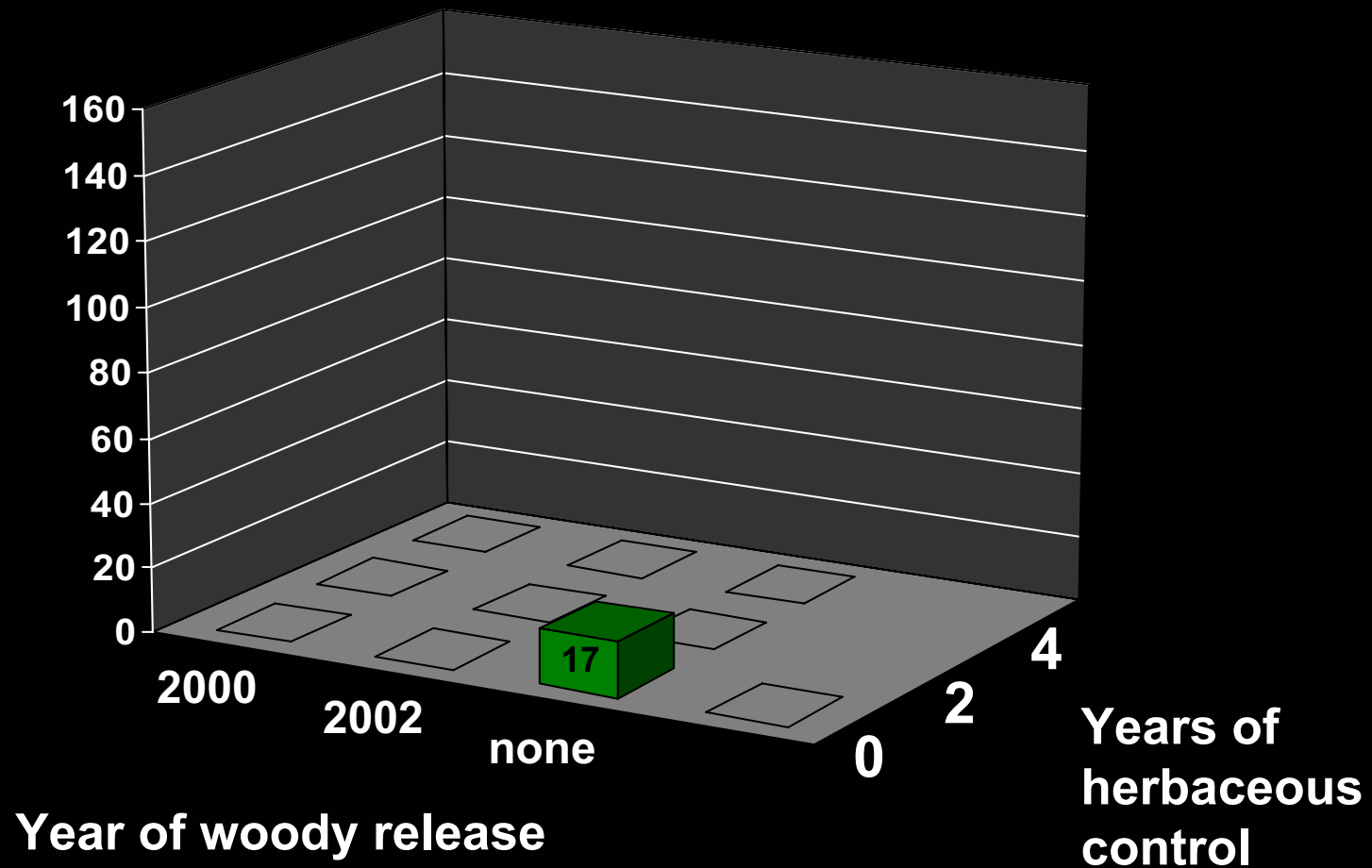
Pw Stem volume index (cm³) – year 4, 2004



Herbaceous weed control is critical...

➔ Pitt et al. 2005. www.forestresearch.ca, RP-31.

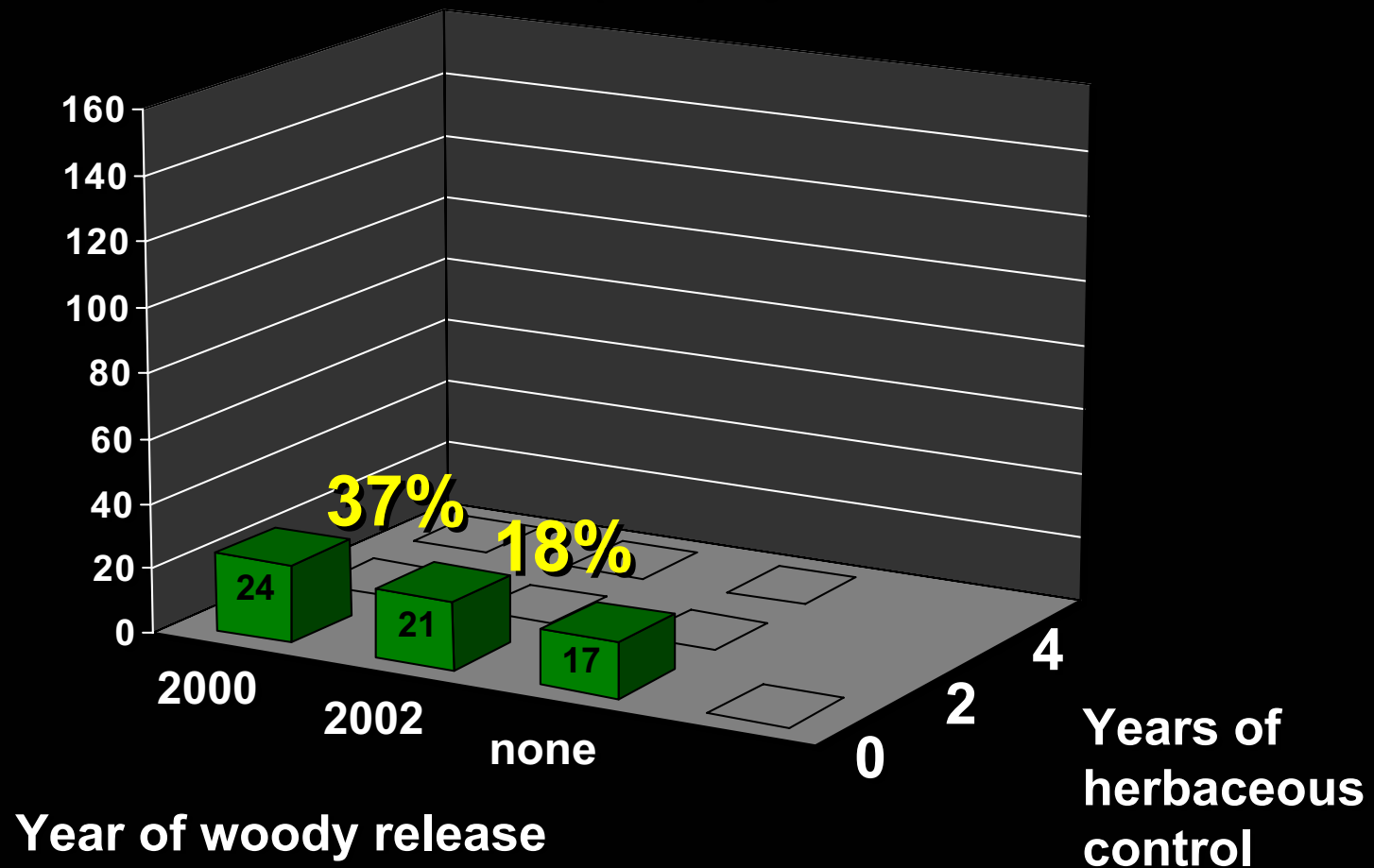
Pw Stem volume index (cm³) – year 4, 2004



Herbaceous weed control is critical...

➔ Pitt et al. 2005. www.forestresearch.ca, RP-31.

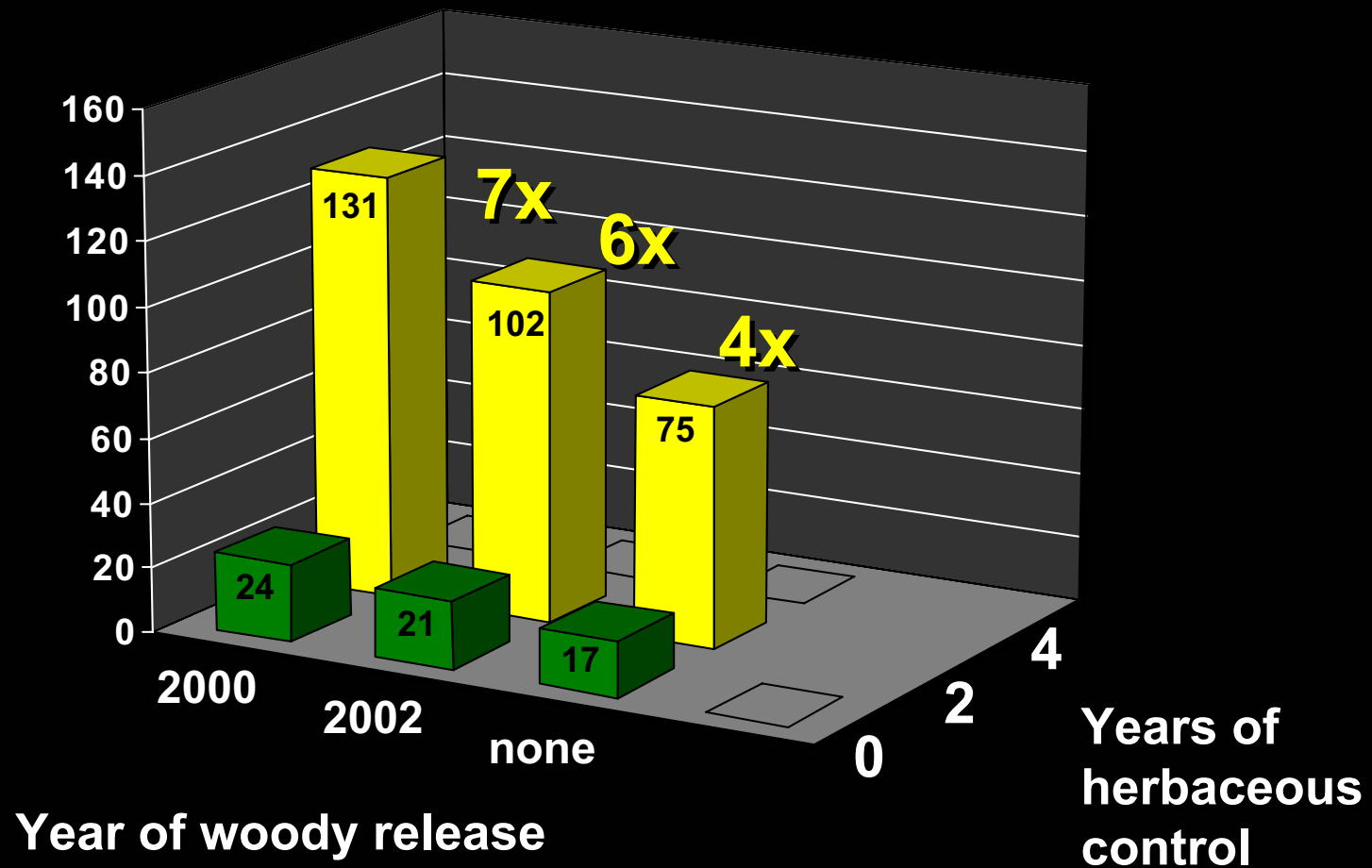
Pw Stem volume index (cm³) – year 4, 2004



Herbaceous weed control is critical...

➔ Pitt et al. 2005. www.forestresearch.ca, RP-31.

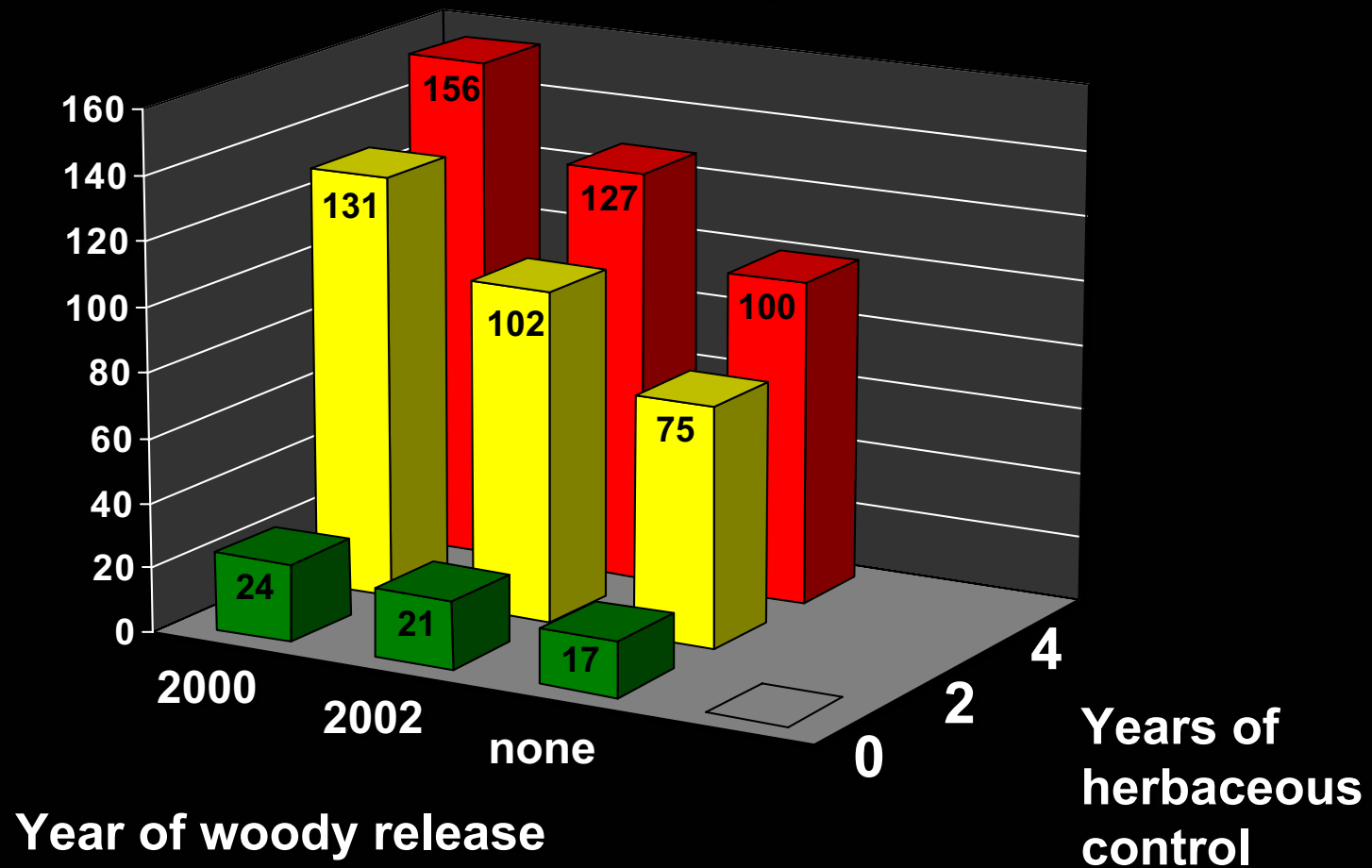
Pw Stem volume index (cm³) – year 4, 2004



Herbaceous weed control is critical...

➔ Pitt et al. 2005. www.forestresearch.ca, RP-31.

Pw Stem volume index (cm³) – year 4, 2004



Herbaceous weed control is critical...

➔ Pitt et al. 2005. www.forestresearch.ca, RP-31.

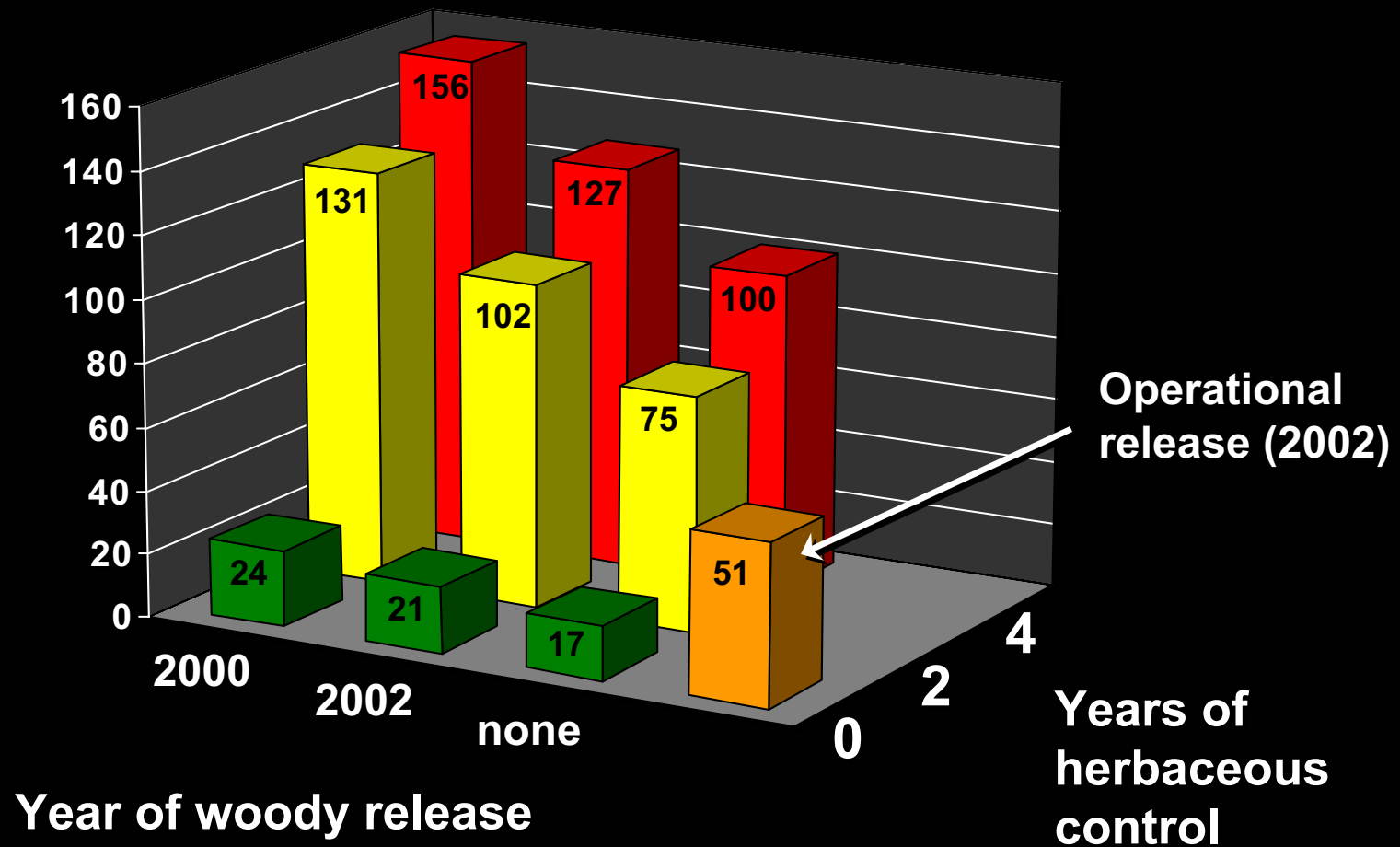


Broadcast release after 2nd GS...

Herbaceous weed control is critical...

➔ Pitt et al. 2005. www.forestresearch.ca, RP-31.

Pw Stem volume index (cm³) – year 4, 2004



Herbaceous weed control is critical...



Herbaceous weed control is critical...

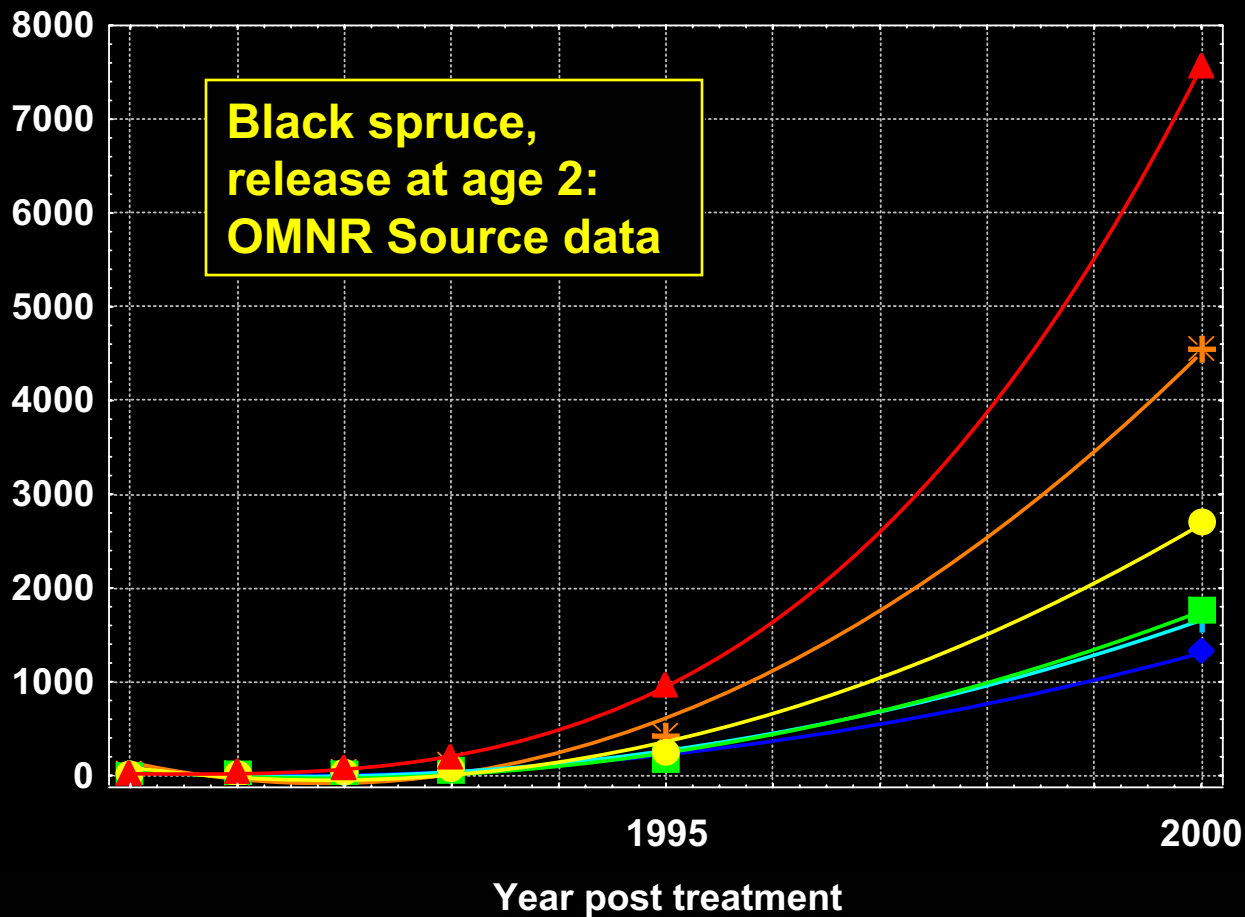
- ➔ Pitt, Wagner, & Towill. 2004. *N.J.A.F.* 21: 123-134.
- ➔ Black spruce, age 12, 10 years after treatment with a range of intensities.



Herbaceous weed control is critical...

➔ Pitt, Wagner, & Towill. 2004. *N.J.A.F.* 21: 123-134.

Stem volume index (cm³/tree)



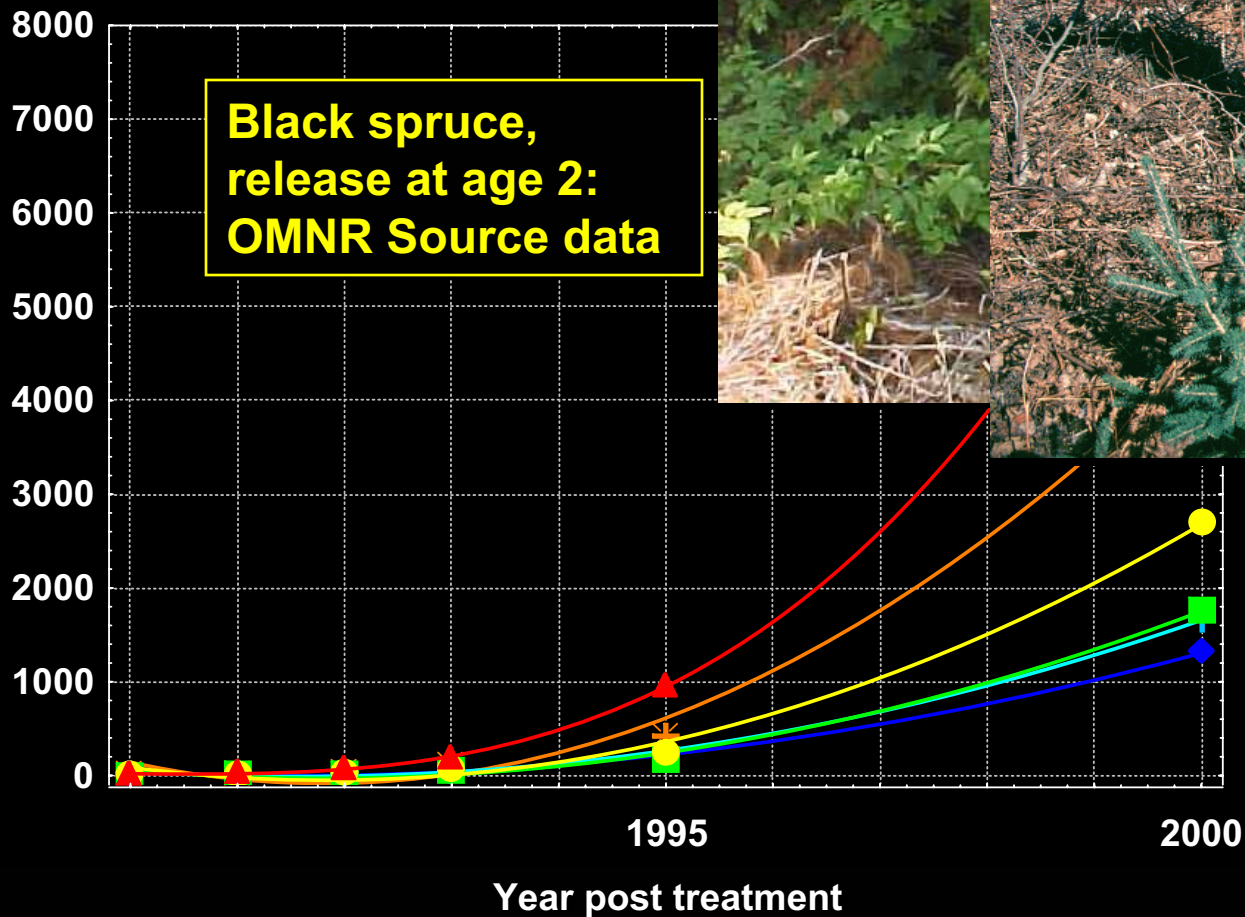
Untreated

Herbaceous weed control

➔ Pitt, Wagner, & Tow



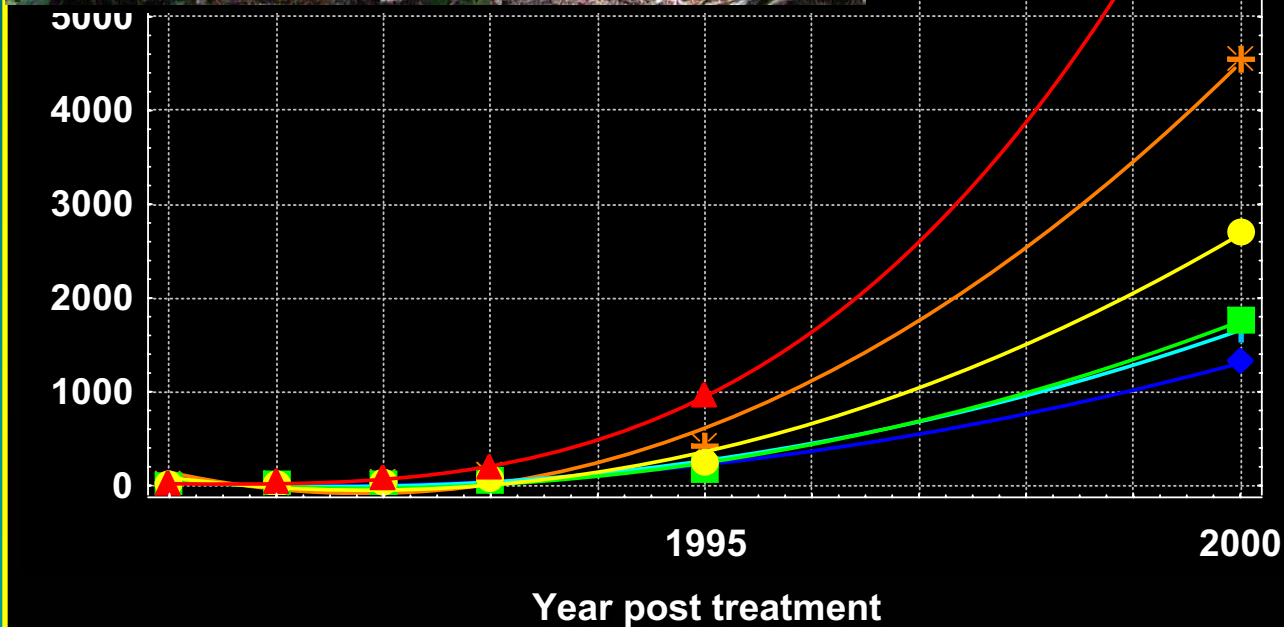
Stem volume index (cm³/tree)



Brushsaw
Basal Bark (Release)
EzJect (Vision)
Untreated

Control is critical...

2004. *N.J.A.F.* 21: 123-134.



Complete removal
Vision (5 years)

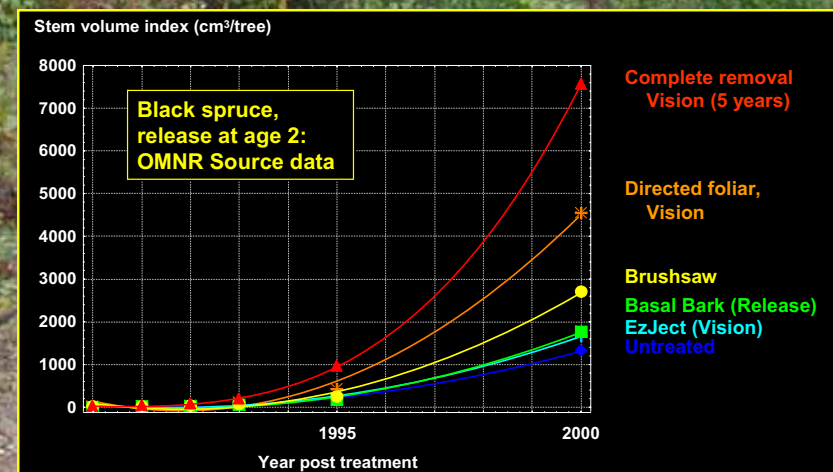
Directed foliar,
Vision

Brushsaw

Basal Bark (Release)
EzJect (Vision)
Untreated

Take-home points

- ➔ Vegetation management is essential in maintaining conifer
- ➔ Effects of vegetation management on conifer production are positive and long-lasting.
- ➔ Results are proportional to intensity.
- ➔ Early action is critical to success.
- ➔ Herbaceous vegetation control is critical to success.



The following partners contribute to Dr. Pitt's research program:

- **Alberta Herbicide Task Force**
- **Alberta Mixedwood Management Association**
- **Blue Ridge Lumber**
- **Canada Foundation for Innovation**
- **Canadian Ecology Centre – Forestry Research Partnership**
- **Canadian Forest Products**
- **Carleton University**
- **Domtar Wood Products Inc.**
- **Dow AgroSciences Canada Inc.**
- **Enhanced Forest Productivity Science Program (Forestry Futures Trust)**
- **Forest Protection Limited**
- **Fraser Papers**
- **Grant Forest Products**
- **J.D. Irving Limited**
- **Lakehead University**
- **Living Legacy Trust (Ontario) Louisiana Pacific**
- **Nipissing Forest Resource Management Inc.**
- **Ontario Innovation Trust Fund**
- **Millar Western**
- **Monsanto Canada Inc.**
- **Natural Resources Canada, Canadian Forest Service**
- **New Brunswick Department of Natural Resources and Energy**
- **New Brunswick Growth and Yield Unit**
- **Ontario Ministry of Natural Resources (OMNR)**
- **Spray Efficacy Research Group - International**
- **Tembec Industries Inc.**
- **University of Alberta**
- **Upper Lakes Environmental Research Network (ULERN)**

