

Planting studies and demonstrations

Established by:

WayDa Gro Forestry Services Ltd.

Nipissing Forest Resource Management Inc.

Vermillion Forest Management Ltd.

Fall vs. Spring Planting – White pine, white spruce, red oak, and jack pine

Established: fall 2001 and spring 2002

Location: McWilliams Township, Nipissing Forest, North Bay District

Objective: to compare the growth and survival of trees planted in the fall to those planted in the spring.

Conclusions after 5 years:

- For all species: fall planted seedlings are taller than spring planted seedlings.
- Survival of fall planted jack pine (83%) is lower than spring planted seedlings (88%). However, for the other 3 species, the fall planted seedlings have better survival than their spring counterparts.

Final report: [LINK TO PDF](#)

Stock Size – White pine

Established: Spring 2003

Location: Gurd Tree Improvement Area (old field site) and McConnell Lakes (operational clear-cut site), Nipissing Forest, North Bay District

Objective: to compare the growth and survival of large (TALL initial height=18 cm) vs. medium (SHORT=12 cm) white pine planting stock (PW03NWEa_2-yr_36 mm Jiffy).

Conclusions after 5 years:

- At the open field site (Gurd), SHORT white pine have caught up to the TALL seedlings, and have better survival (94 vs. 80 %).
- At the operational site (McConnell), SHORT white pine seedlings are the same height as TALL, but are significantly larger in stem volume. Survival of the two groups is similar at this site (>90%).
- The white pine in this trial are performing better at the 'open field' site compared to the 'operational' site (20 % taller and 3.8X the stem volume), probably as a result of more competing vegetation at the operational site.

Final report: [LINK TO PDF](#)

Nursery Fertilizer Regimes – Red Pine

Established: Spring 2003

Location: Gurd Tree Improvement Area and McConnell Lakes, Nipissing Forest, North Bay District

Objective: to compare low vs. high nutrient levels at the nursery on field performance after planting (70 vs. 112 mg N/pellet during 2002 nursery phase) of red pine grown in jiffy containers (36 X 75 mm).

Conclusions after 5 years:

- Red pine seedlings that received more fertilizer during the nursery growth phase performed better after field planting.
- Although foliar nitrogen has been correlated with improved field performance, in this trial, performance is related to total fertilizer applied.
- This trial has shown that events during the tree nursery phase of forest regeneration can have a dramatic, long-lasting effect on the quality of forest plantations and the future forest condition.

Final report: [LINK TO PDF](#)

Crop Age – White pine, red pine, and white spruce, 1-yr vs. 2-yr stock

Established: Spring 2003

Location: Gurd Tree Improvement Area and McConnell Lakes, Nipissing Forest, North Bay District

Objective: To compare the field performance of 1 yr vs 2 yr jiffy container stock of white pine (36 mm), red pine (36 mm) and white spruce (30 mm)

Conclusions:

- At time of planting 1-year old stock was much smaller than 2-year stock for white spruce and red pine (half the size). For white pine, 1-year seedlings were almost as tall as 2-year stock, but were not as robust.
- After 5 years at the operational site (McConnell), the 2-year white pine and red pine seedlings are slightly larger than the 1-yr old seedlings, but this difference is not significant. For white spruce, although 1-year old seedlings were much smaller initially, they have caught up and passed the 2-year stock by the end of the 5th year.
- At the open field site (Gurd), 2-year old white pine and red pine remain significantly larger than 1-year old seedlings after 5 years. The 1-year old white spruce have caught up to the 2-year seedlings after 5 years.
- For red pine, there is a very large difference in survival favouring the 1-year old seedlings. However, the 2-year stock had a root problem at the nursery.
- Although this test shows that 1-year old seedlings can perform as well as or better than 2-year stock in an operational plantation, we should be cautious before discontinuing the larger 2-year stock. There are many factors affecting the quality of nursery stock, and it is possible that the 2-year stock growing methods could be adjusted to produce higher quality, more vigorous stock at the scheduled shipping time. For example, the Jiffy container size could be larger for the 2-yr old stock.

Final report: [LINK TO PDF](#)

Overwinter Storage – Red pine - indoor frozen storage vs. outdoor

Established: Spring 2003

Location: Gurd Tree Improvement Area and McConnell Lakes, Nipissing Forest, North Bay District

Objective: To compare field performance of red pine seedlings (jiffy 36 X 75 mm) that were overwintered in indoor frozen storage vs outdoors.

Conclusions:

- After the 5th growing season (2007) survival remained high for both groups at both sites (>90 %), and there were no significant differences in size between indoor frozen -stored and outdoor overwintered red pine.
- However, red pine at the open site was 67% taller and had 10X the stem volume compared to the operational site. Even though these are different soil types, this difference is probably mainly due to heavy competition from poplar and red maple at the operational site up until late 2005.

Final report: [LINK TO PDF](#)

Planting Depth – White pine, red pine

Established: Spring 2003

Location: Gurd Tree Improvement Area and McConnell Lakes, Nipissing Forest, North Bay District

Objective: To compare the survival and growth of white pine (PW03NWEa_2-yr_36 mm) and red pine (PR03NWE_2-yr_36mm) seedling planted at different depths:

- shallow = 1-2 cm of plug showing above soil surface
- even = top of plug even with soil surface

- 25 % of stem buried = top of plug ~ 2.5 cm below soil surface
- 50 % of stem buried = top of plug ~ 5 cm below soil surface

Conclusions after 5 years:

Red pine:

- At the open field site (Gurd), red pine planted with the soil plug even with the soil surface or buried ~2.5 cm performed better compared to exposed plug seedlings or plugs buried 5 cm.
- At the operational site (McConnell), there is little visual difference in red pine performance based on planting depth. However, seedlings that were planted with about 2.5 cm of the stem buried are significantly larger in stem volume. Also, survival was lower (<70 %) for seedlings planted with 5 cm of stem buried.
- Red pine performed better at the 'open field' site compared to the 'operational' site (12 % taller and 3X the stem volume) probably because of heavy competition from poplar and red maple at the operational site.

White pine:

- At the open field site (Gurd), white pine planted with the soil plug even with the soil surface or buried ~2.5 cm are performing better compared to exposed plug seedlings or plugs buried 5 cm.
- At the operational site (McConnell), white pine seedlings planted with the plug exposed or even with the soil surface have performed better. Although the white pine planted deeper have experienced a higher degree of competition, and are significantly smaller, they are still quite healthy and have survived well (>85%).
- Again, the white pine performed better at the 'open field' site compared to the 'operational' site (21 % taller and 5X the stem volume) probably because of heavy competition from poplar and red maple at the operational site.

Final report: [LINK TO PDF](#)

Ongoing projects:

Project Name:	Yr. Est.	Locations	Comparisons
Growth enhancing agents (BP & Myc)- Pj	2003f	GURD McConnell	BioProtect(BP) & Mycorrhizal Fungi
Container Size - Pw	2003f	GURD Killarney	J30, J3675, J36100, J42
Container Size - (1-yr) PR04NWEb, PR04NWEc	2004s	McConnell Killarney	30Reg vs. 36Reg
BioProtect(BP) - (1-yr) PR04NWEc	2004s	McConnell Killarney	30BP vs. 30Reg
Container Size - (1-yr) PW04NWEb, PW04NWEc	2004s	McConnell Killarney	30Reg vs. 36Reg
BioProtect - (1-yr) PW04NWEb	2004s	McConnell Killarney	36BP vs. 36Reg
BioProtect - (2yr - 36mm) PR04NWEa	2004s	McConnell Killarney	36BP vs. 36Reg
BioProtect - (2yr - 36mm) PW04NWEa	2004s	McConnell Killarney	36BP vs. 36Reg vs. damaged
Crop Age - (36mm) PW04NWEa, PW04NWEb	2004s	McConnell Killarney	1 yr vs. 2 yr stock
Crop Age - (36mm) PR04NWEa, PR04NWEb	2004s	McConnell Killarney	1 yr vs. 2 yr stock
Sb - Sw - Sr SB04NWE, SW04NWE, SR04NWE	2004s	McConnell Killarney	Sb vs. Sw vs. Sr

Nutrient Spiking - (gh's 9F and 4F) PJ04VWEa	2004s	McConnell Bowell	9F/4F - 0/300/600/1200 ppmN
---	-------	---------------------	-----------------------------