Renovating Shelterbelts and Woodlots

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Growing Forward 2
A federal-provincial-territorial initiative
Purpose

• To identify, remedy and maintain aging shelterbelts.
• To keep shelterbelts in good condition so their benefits can be fully achieved on the landscape.
Shelterbelt Species

- Deciduous Trees
  - Green Ash (75y)
  - White Birch (30-50y)
  - Bur Oak (100y)
  - Manitoba Maple (35-60y)
  - Hybrid Poplar (Northwest, Walker, Towering, Oakanese, 15-30y)
  - Willow (Peachleaf, Silverleaf, Acute, 25-60y)
Shelterbelt Species

• Coniferous Trees
  – White Spruce (50 – 100 y)
  – Colorado Spruce (50 – 100y)
  – Pine (Lodgepole, Scots, Jack, Ponderosa, 50 – 100y)
  – Siberian Larch (100y)
  – Fir (Balsam, Douglas, 50 – 90y)
Shelterbelt Species

• Shrubs
  – Villosa Lilac (50y)
  – Buffaloberry (Canada, Silver, 25y)
  – Mugo Pine (20 – 60 y)
  – Prunus (Cherry, Mayday, 10- 50 y)
  – Hedge Rose (25y)
  – Sea Buckthorn (10 – 20y)
  – Hawthorn (40 – 60y)
  – Caragana (immortal)
Checklist - Review

- The aforementioned factors will influence what actions are required:
  - % Live Trees
  - Density of Canopy
  - Disease
  - Insect Damage
  - Age of Shelterbelt
  - Life Expectancy
  - Understory Regen
  - Livestock Presence
  - Species Diversity
  - Row Spacing
Problems with Aging Shelterbelts

- As shelterbelts age, their functions can be reduced
  - This is a function of tree health and age
  - As well as overall shelterbelt age
# Shelterbelt Basics

## Open Wind Speed 20 mph
40 to 60% Density

<table>
<thead>
<tr>
<th>h distance from windbreak</th>
<th>5h</th>
<th>10h</th>
<th>15h</th>
<th>20h</th>
<th>30h</th>
</tr>
</thead>
<tbody>
<tr>
<td>miles per hour</td>
<td>6</td>
<td>10</td>
<td>12</td>
<td>15</td>
<td>19</td>
</tr>
<tr>
<td>% of open wind speed</td>
<td>30%</td>
<td>50%</td>
<td>60%</td>
<td>75%</td>
<td>95%</td>
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Checklist - Barrier

- Continuous barrier
  - Step back and view from a distance
  - No gaps, which can form wind tunnels and reduce efficiency
  - This is dependant on the function of the shelterbelt
Checklist – Canopy Density

• 50% Density
  – Step back from the trees and assess from a distance
  – This is focusing on branches, minimum of 50% density with leaves on
  – Density will differ for purpose
Checklist – Tree Health

• Less than 25% trees are dead
  – Focusing the whole tree not just branches of the trees

• Better candidates for in-fill
Checklist – Insect Damage

• Healthy crowns with less then 25% insect damage
  – Insect damage can very and there impact can be minor to fatal.
  – Identification of insect is important but severity of attacks can be an indicator of tree health.
Checklist - Disease

- Tree Health - Disease
  - Disease of fungus can be serious threats to tree health.
  - Depending on infection, removal may be necessary
Checklist - Livestock

• Livestock Activity
  – Livestock impact in and around the shelterbelt
  – Trampling, rutting, browsing, direct damage, root injuries
  – Nutrient loading from animal waste will have negative effects on tree growth
Checklist - Regeneration

• Natural Regeneration
  – Are the trees within your shelterbelt naturally regenerating
  – This includes vegetative regeneration, or from seed
  – Indicates good growing conditions and minimal competition
Checklist - Lifespan

- Will the trees live for another 20 years
  - Are they healthy?
  - How close to maturity are the trees?
Possible Checklist Additions

• Species Diversity
  – Or lack there of
  – Depending on planting type
• Row Spacing
  – Maintaining tree health
• Aesthetics
  – May be important for perception
Rejuvenation and Maintenance

- There are several techniques to manage trees in the older shelterbelt and to think about the future function of the shelterbelt:
  - Tree Removal
  - Filling gaps
  - Spacing Adjustment
  - Livestock Seclusion
  - Addition of Rows
  - Pruning
  - Understory Regen
  - Tree Care
Removal of Dead Trees

- Removal of dead material is vital, identify the reason for insect, disease and growing condition
- Replace depending on location and species an species change maybe needed.
  - Catching some species when they are decline rather then dead provides more management options
Fill in Gaps

- Important to fill gaps to maintain a consistent barrier
- Replanting will be required, site preparation and weed control will be important as sun will be penetrating to the ground.
- Site appropriate species important as shade may be an issue.
Understory Plant

- In multi row shelterbelts under planting is an option.
- Again shade tolerant species and low vegetative competition.
- Slow growth, but nurse trees should provide shelter to aid in survival.
Coppicing

• Coppicing is commonly seen with willows.
• Stems are removed the regrowth comes up from the remaining stump
Row Addition
Spacing

- Trees planted too close to each other compete for resources (Nutrients, light, water, space)
- When planted too close together the stresses of competition can lead to disease and insect infection
Livestock

• Exclude livestock or reduce grazing intensity
Pruning/Shear

• Trimming shelterbelts to prevent creeping into neighbour fields.
• Will also improve canopy density.
Future Planning

• Even if the shelterbelts are in good condition a plan on rejuvenation can reduce the impacts of change
• Factors like tree maturity and row spacing will be important
• Multi-row belts allow for more options in replacement but can also provide difficulties for young trees to grow
Pruning Objectives

- Remove diseased or storm-damaged branches
- Thin the crown to permit new growth and better air circulation
- Reduce the height of a tree to remove obstructing lower branches
- Shape a tree for design purposes
- Reduce potential for fire
Where Maintenance is Necessary

Photos: Heather Dickau
Shelterbelts in Need of Maintenance

Photos – Heather Dickau
Fire Blight
(bacteria)

Time: Growing season
Symptoms: Blight of foliage, dieback, cankers on stem and trunk.
Control Method: Remove infected material with sterilized pruners.
Black Knot
(fungus)

**Time:** Infection occurs during spring

**Symptoms:** Black swellings on branches

**Control Method:** Prune affected branches provides effective control, but it is important to carefully sterilize pruners between every cut.
Woodlot/Shelterbelt Pruning

- Reduce potential for fire
- Reduce potential for various human or livestock injuries
- More pleasant for many people
- Most of internal branches are dead and can be removed
- Increase the value of the logs
- Produce better lumber – knots free
How to Prune?
Proper Pruning

B. Cutting a small branch

C. Cutting a larger branch
Proper Pruning – Heavy Branches
Proper 3 Cut Pruning
Improper Pruning

A. Topping
B. Tipping
C. Bark ripping
D. Flush cutting
E. Stub cutting
Conclusion

• Replacing the trees in place is the ultimate goal
  – Once the trees are removed its easy to not replant
• Identifying potential problems is the first step
• As with everything planning is important
What to do with all that Wood?

• Pile and Burn it?
• Chip it?
• Salvage it?
  – Firewood
  – Sawlogs
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