

Prairie Fires: Windbreak and Shelterbelt Rejuvenation

By

Toso Bozic

Prairie fires play an important role in healthy prairie ecosystems by rejuvenating native vegetation and speeding up plant decomposition. All native plants and shrubs are well-adapted to prairie fires and thrive after the fires. Fires return nutrients to the soil and slow the invasion of trees. But prairie fires are also a destructive force to homes, livestock, infrastructure and our livelihood.

Fire and windbreaks

Planted windbreaks and shelterbelts provide many functions, one of the most important being slowing down the fast moving and high intensity prairie fires. The soil in and near shelterbelts are generally moist. A shelterbelt gives fire crews a better chance to combat the fires and get them under control. The wider the shelterbelt, the better the impact on slowing down the fire.

Fire prevention in shelterbelts

Fire can start around a farmyard for various reasons and spread to a nearby shelterbelt. Alberta Agriculture and Forestry's [FireSmart for Homeowners](#) and FireSmart Canada's [FireSmart Begins at Home](#) manuals are good tools as a starting point to evaluate potential fires around farm yards. There are several activities to reduce fire hazards in your shelterbelts:

- Prune lower dead branches on trees. Remove interior dead branches as they would be the first to catch flames
- Prune tree branches up to two meters from the ground in your yard
- If you have an older shrub row, remove dead stems individually or cut the entire row to be rejuvenated by root suckering
- Do not prune trees or shrubs during strong winds and low air moisture
- Avoid using power tools like chainsaws during dry weather conditions as a spark can ignite fire
- Use hand tools (pruners, loppers and handsaws) to perform pruning
- Call your utility company to remove branches or tops close to powerlines
- Clean woody debris and combustible shrubs from the ground
- Avoid planting flammable trees next to your house, barn or any sheds.

Rejuvenation of trees and shrubs affected by prairie fires

Depending on the fire intensity and damage, many trees and shrubs may recover naturally.

Shrub rejuvenation

Most shrubs will regenerate by either root suckering or seed production. Natural regeneration will depend on how much damage shrub stems and roots have sustained. If there is little stem damage, new leaves and growth will show up shortly after a fire.

Caragana is a hardy non-native shrub that is moderately fire-resistant. It rejuvenates by seed production and by root rhizomes. It is a prolific seed producer whose seeds may stay in the soil for years. Once

conditions are favorable, new plants will grow from the seeds. Roots are dense and widely spread. Root suckering is very common. Caragana is a nitrogen-fixing legume that after a fire helps restore nitrogen back into the soil.

- After a fire, wait to see if stems will produce new leaves, flowers in spring and seed pods later in the year. If there is little damage a successful regeneration will follow.
- If there is no new leaf growth, cut burnt stems to the ground. New growth should spring up either from rhizomes or seeds.



Photos by Garry Murray, MD of Willow Creek – Burnt caragana row

Lilac is also a hardy non-native species that rejuvenates usually by root suckering. Roots are dense but shallow. Cut stems six inches above ground to stimulate root suckering and new growth. If there is no suckering, new planting is necessary.

Sea buckthorn is a hardy non-native shrub, rejuvenated mostly through profuse suckering.

Tree rejuvenation

Natural tree regeneration will depend on the species type and amount of damage that the fire caused. Each tree will respond differently when it comes to natural regeneration. Most coniferous trees except pines may need to be replanted. Hardwood species are fairly fire resistant due to the high level of moisture in them.

Burnt trees can be used for firewood purposes. Be careful with charred dust particles while cutting wood.

Pines - natural rejuvenation by fire is one of the most common ways to get new pine trees. Heat from the fire forces pine cones to open and release tightly protected seeds. Seeds fall on very fertile ground and start growing almost immediately after the fire. Pine bark can sustain some fire damage.

Spruce trees are not as well adapted to natural rejuvenation by fire as pines. Fires of almost any intensity may kill spruce, including cones and seeds. Natural regeneration from seeds only occurs when nearby live trees produce seeds that fall on the burnt area. Spruce trees produce seeds every 4-8 years. If all spruce trees are burned in fire, the only way to get spruce in your shelterbelt is through tree planting.

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Photos by Garry Murray -MD of Willow Creek – Burnt spruce trunks and lower branches

Cottonwoods, hybrid poplars, aspen and willows have incredible root systems and suckering is almost guaranteed after the fire. You will end up with thousands of young suckers.

Manitoba maple is a prolific seed and sucker producer. It naturally establishes by seed under a wide range of conditions including immediately after fire disturbance on moist soil. Suckering is also quite a common way to reproduce Manitoba maple. If the whole tree burns, roots will stimulate suckering and begin sprouting.

Ash (green and black) are also prolific seed producers. Ash seeds remain viable in the soil for up to three to four years. Suckering is not a common way of regeneration. Natural regeneration will occur most likely through the seeds.

Elm trees are relatively fire resistant due to their thick bark. American elm is a prolific seed producer. If the whole tree is burnt, tree planting is recommended.

Prairie fires can be destructive and life changing for land owners. Windbreaks can slow down the spread of these devastating fires and cause less harm. A green belt of trees and shrubs planted around rural communities can help protect them from a fast-moving fire. Windbreaks and shelterbelts are the first step for fire prevention in the prairies.

For more information:

Toso Bozic P.Ag

ISA Certified Arborist

www.yardwhispers.ca or www.attsgroup.ca