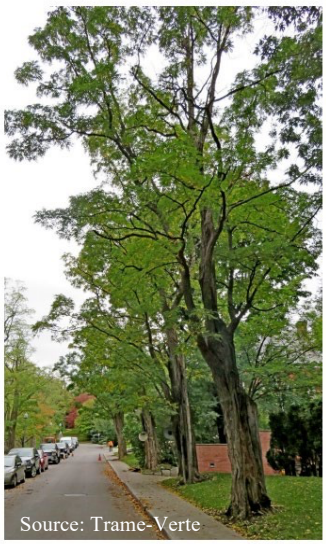
The dominant tree species in King George Park are the Robinia trees (black locust). They make up almost a third of the park's canopy.

PARTICULARITIES OF THE SPECIES

Robinia (pseudoacacia) is an invasive alien species native to the United States. It has been planted for a long time and has become naturalized almost everywhere in the northern hemisphere, mainly due to its high capacity to produce suckers and stump sprouts. It is now considered a pest species, both here and elsewhere. They are prized for their ornamental habit, foliage, bark and flowering.


Source: Trame-Verte


Source: Pixabay


Source: Pixabay

DESCRIPTION OF THE SPECIES

The species shows typical abilities of a fast-growing coloniser: preference for rich soils, shade intolerance, rapid growth, large size and limited longevity. Some people call it Acacia, after the species that is emblematic of the African savannahs, hence the name Robinia pseudoacacia, but these members of the Fabaceae family are two very different species. The Robinia can reach a height of just over 20 m in our latitudes and a lifespan of about 90 years[1].

FRAGILITY

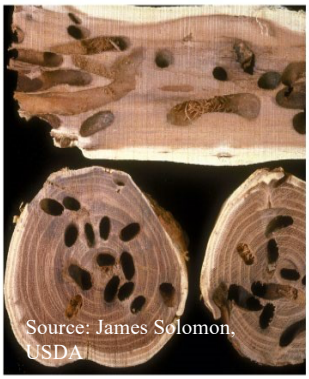
Unfortunately, the Robinia is a very fragile species:

- Although its wood is known to be relatively strong and durable, it is also stiff and brittle. As reported by the renowned American researcher Ed Gilman, the branches frequently form a narrow angle with the trunk, resulting in poor joinery and the development of decay leading to severe breakage[2].

[1] Farrar, J.L.(1995). Les arbres du Canada. 502 p.

[2] Robinia pseudoacacia – Black Locust Fact sheet (1994). E.F. Gilman, D.G. Watson. U.S. Forest Service (https://bit.ly/3RxMEt3)

- The species is known to be very vulnerable to insects and pathogen attack, probably more so than any other hardwood species[3]. It is particularly vulnerable to the Locust borer, a boring insect whose larvae feed under the bark and in the solid wood by digging numerous holes. These galleries weaken the wood and promote the spread of decay, which further weakens the structure of the tree.


Source: James Solomon, USDA


Source: Thérèse Arcand, RNCAN

- Although naturalized, the species is vulnerable to cold, which can cause a branch or trunk section mortality.

RESILIENCE


Source: Trame-Verte

Regrowth on a carved totem pole (summer 2022)

Robinia trees are very resilient to the various stresses that affect them. Therefore, whether it is cyllene attacks or severe pruning, the survival of the tree is usually not at stake and foliage quickly returns from the trunk or branches through dormant buds.

This is an advantage when trying to secure trees whose aerial structure is at risk of breakage, since it is sufficient to reduce the crown (top) and let the foliage grow back. On the other hand, the resilience of Robinia trees is sometimes deceptive; even dense foliage can hide important structural defects that are difficult to perceive for the untrained eye. Sometimes even a Robinia with dense foliage can have a sufficiently degraded structure to justify felling.
The presence of foliage is therefore not an important criterion for determining the risk of a mature Robinia.

The difficulty in inspecting Robinia trees comes from the combination of the durability of its wood, its high resilience to stress, its brittleness, and its vulnerability to structural defects. It is common to conserve structurally degraded trees based on structural tests and the expertise of forest engineers. However, the specific

[3] Black Locust (1990). J.C. Huntley. Sylvics of North America. USDA. (https://bit.ly/3AZlB3k)

characteristics of the Robinia and the overabundance of ageing individuals in the park require a holistic approach to tree management and planning for the gradual replacement of the most damaged individuals.

TREE RISK ASSESSMENT

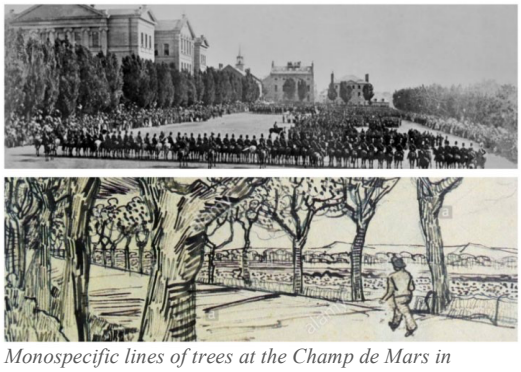
All mature trees are susceptible to developing structural defects, hence the need for regular inspection. Tree risk is determined by several factors: the environment (site use, infrastructure, wind exposure, nearby works, etc.), traffic, structural defects and the risk of breakage and damage. The main structural defects that can be observed usually involve decay or insect damage and are often the same from one species to another: decayed fork, decayed wound or lesion, branch mortality, etc.

Generally, an experienced assessor is able to evaluate the risk of breakage from directly observable signs of degradation at the top or trunk. Sometimes a sounding with a mallet is necessary to assess the extent of internal decay. Less frequently, more detailed investigations are required to determine the extent of decay (e.g. tomography, densimetry, height inspection).

In all cases, when pruning or bracing is prescribed, it is because a risk must be mitigated or a situation corrected. As a last resort, if the entire tree presents a significant risk that cannot be mitigated by pruning or bracing, then felling becomes the only option.

HISTORY OF PARK DEVELOPMENT

As renowned as the urban planners and designers were in the 19th and early 20th centuries, some aspects of sustainable development eluded them. Uniform plant rows and groves, known as monospecific, were generally favoured for their aesthetic appeal, and this is still often the case. However, industrialization and globalization have led to environmental threats such as invasive alien species, which have caused significant damage. This is precisely what happened in King George Park, where an abnormally high concentration of trees of a single species (the Robinia) led to the current situation where all these trees are almost simultaneously reaching the end of their life.



Monospecific lines of trees at the Champ de Mars in Montreal in 1886 (top photo) and along the roadside, as drawn by Vincent Van Gogh in 1888 (bottom image).

FOR A HEALTHIER URBAN FOREST

Many of the problems associated with urban forests today are related to the lack of diversity of tree species planted over the last century. King George Park is a good example, with a canopy that is 50% Robinia and Norway Maple, both

invasive species and prone to significant structural weakness. In order to improve the condition of the urban forest, the best approach is to plant a wide diversity of species, whose biological functions and mechanisms differ sufficiently to allow the canopy to withstand environmental stresses well[4].
During the 5 years of the King George Park tree intervention plan, every tree felled will be replaced in the same year by 2 new trees from 14 new species.The Robinia tree will continue to be an important species in King George Park; many young trees are already present and over 90 mature Robinia trees will be preserved (almost 25% of the trees in the park). Some sites have more limited space or various constraints limiting the possible crown size (e.g., medium or small spread, or even columnar).

The following list describes some of the species to be planted:

Species planted	**Caracteristics** Functional groups indicated in ( )
Betula platyphylla 'Dakota Pinnacle' Bouleau japonais 'D. P.'	Leafy - columnar habit, fast growing, exfoliated bark, (5)
Juniperus virginiana Génévrier de Virginie	Conifer - small spreading, light species, slow growing, native, (1B)
Larix laricina Mélèze laricin	Conifer - medium spreading, fast growing, native, (1B)
Liriodendron tulipifera Tulipier	Deciduous - medium spreading, fast growing, very ornamental, (3B)
Pinus nigra 'Arnold Sentinel' Pin noir 'A. S.'	Conifer - columnar, moderate growth, dense foliage, (1B)
Pinus strobus 'Fastigiata' Pin blanc fastigié	Coniferous - columnar, mid-shade, fast growing, rounded top, (1A)
Platanus occidentalis Platane occidental	Deciduous - wide spread, fast growing, typical exfoliated bark, (2C)
Populus x canadensis 'Eugenei' Peuplier carolin	Leafy - large spread, fast growing, native, historical role, (5)
Pyrus calleryana 'Chanticleer' Poirier Calleryana 'Chanticleer'	Deciduous - small spread, moderate growth, wildlife tree, good flowering, (3A)
Quercus bicolor Chêne bicolor	Deciduous - large spread, slow growth, mid-shade, rare species, (4A)
Quercus imbricaria Chêne à lattes	Leafy - large spread, slow growth, mid-shade, rare species, (4A)
Quercus alba Chêne blanc	Deciduous - large spreading, slow growing, native, rare, (4A)
Tilia americana Tilleul d'Amérique	Deciduous - wide spreading, moderate growth, native, mid-shade (2A)
Tsuga canadensis Pruche de l'Est	Coniferous - large spread, shade, slow growing, native, noble (1A)

To consult the functional groups detailed description, visit: arbresurbains.uqam.ca/fr/guidereboisement/guide.php

THE ROLE OF THE FORESTRY ENGINEER IN URBAN FORESTRY
Forestry engineers have a long-term vision. In the city, this perspective is refocused more specifically at the tree level, seeking to conserve trees as long as possible, while taking a global view of the urban canopy, uses and growing conditions.
In addition to the Ordre des ingénieurs forestiers du Québec (OIFQ), the Société Internationale d'Arboriculture Québec (SIAQ), the Quebec chapter of the International Society of Arboriculture (ISA), as well as the multiple certifications and qualifications of our forest engineers involved in the park, add additional levels of protection to ensure the proper management of urban forests.

For more details on upcoming interventions and plantings, visit the dedicated page on the City of Westmount website:
engage.westmount.org/en/project/the-trees-of-king-george-park

[4] Paquette, A. et Messier, C. Repenser la diversité – l'approche fonctionnelle. Chaire de recherche CRSNG / Hydro-Québec sur le contrôle de la croissance des arbres, Université du Québec à Montréal. En ligne : www.arbresurbains.uqam.ca/fr/guidereboisement/guide.php