

Growth and Adaptation Potential of Flowering Shrubs under Climatic Conditions of Quebec and North Eastern Ontario: REPLOQ

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INTRODUCTION

The Réseau d'essais des plantes Ligneuses Ornementales du Québec (REPLOQ) is a woody ornamental trial network. Its objective is to show the importance of qualifying the hardiness rating of ornamental plants when they're placed in different weather conditions to determine their real potential. This research permitted the compilation of data for more than 400 species of trees or shrubs over a 5-year period, through the eastern Canadian Zones covering the areas of Quebec and northeastern Ontario. For this poster, four species have been studied.

MATERIAL AND METHODS

Young plants of *Kerria japonica* and *Weigela* 'Bristol Ruby' were studied from 1984 to 1989, and young plants of *Hydrangea arborescens* 'Annabelle' and *Rosa multiflora* from 1986 to 1991. They were evaluated in eight different climatic zones, corresponding to Zones 2 to 5 of the Canadian Climatic Classification System defined by Ouellet and Sherk (1972).

Evaluation of the Adaptation and Growth Potential of the Species.

To evaluate the potential of those plants we measured winter damage and growth. The flowering period and peak flowering period were also recorded.

	Data studied	When?
Winter damage	Mortality (%) Type of frost, evaluated on a qualitative scale (1 to 4).	Every spring Every spring
Growth	Height and width (cm)	Spring (after the annual pruning) fall (after the leaves had fallen)

RESULTS

Species and cultivars selected responded in three different ways to winter damage; three different potentials were defined.

Survival Potential. A plant's survival potential indicates where it can be expected to survive the winter.

Species	Mortality (%)	Rating zone (survival potential)
<i>Rosa multiflora</i>	No	2a
<i>Weigela</i> 'Bristol Ruby'	93% in Zone 2a	2b
<i>Kerria japonica</i>	Significant mortality in Zones 2a and 2b.	4
<i>Hydrangea arborescens</i> 'Annabelle'	Completely killed in Zone 2a 50% death in Zone 2b	4

Potential for Full Ornamental Expression. Potential for full ornamental expression will be fulfilled in zones where little or no winter damage occur, for example:

Weigela 'Bristol Ruby' Slight damage in Zone 5b
 More severe damage in the other zones
 This species can reach its full ornamental
 expression in Zone 5b (Table 1)

In all other species evaluated, winter damage was observed even in Zone 5 (Table 1). Their potential for full ornamental expression, without risk of frost damage, can thus only be realized in zones warmer than Zone 5b.

Table 1. Characterization of the hardiness potential of four shrubs compared with the conventional hardiness rating.

Species	Canadian zone	U.S.D.A.	Survival	REPLOQ	
				Full ornamental expression	Partial ornamental expression ^Z
<i>Hydrangea arborescens</i> 'Annabelle'	3b	3	4	> 5b	2b, Flo
<i>Kerria japonica</i>	5	4	4	> 5b ³	5b, Flo-FI
<i>Rosa multiflora</i>	5b	3	≥ 2a	> 5b	> 5a, Flo, Fl, Rt
<i>Weigela</i> 'Bristol Ruby'	5	5	2b	5b	4, Flo

^ZFlo = flowers, Fl = foliage, Rt = roots

Potential for Partial Expression of Ornamental Characteristics. A plant may partially fulfill its potential for expression even after winter damage is sustained, expressing a number of satisfying ornamental characteristics.

Species	Rating
<i>Rosa multiflora</i>	Blooms only in Zones above 5a Zone 2 for use as foliage plants
<i>Weigela</i> 'Bristol Ruby'	Zone 4 is warranted for this cultivar considering the abundance of the first flowering
<i>Kerria japonica</i>	Potential use for flowering is limited to Zone 5b and above; while it may be used for its foliage in Zone 4
<i>Hydrangea arborescens</i> 'Annabelle'	Stems were heavily damaged by frost at all sites; this cultivar may be used in Zones up to 2b

CONCLUSIONS

Results presented for these four species have led to a better understanding of the three potentials defined in this poster. At the limit of a plant's range, its potential is limited to survival. In the most favorable zone, the plant adapts to reach full ornamental expression. A plant's potential for partial expression of characteristics, which is often close to one of the first two potentials, provides a more specific indication of how it can be expected to perform in intermediate zones.