Breeding Winter Hardy And Everblooming Roses

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Very few shrubs flower repeatedly during one season. Roses are the most notable of these but not all roses are everblooming. Generally, everblooming roses are not hardy. They survive the winters in Canada without protection only at the coast of British Columbia and the most southern region of the Ontario Peninsula. On the other hand, the native Canadian species and other hardy roses are not everblooming. There are a few exceptions, but in 1961, at the beginning of this work, it was not certain whether the character of continuous bloom was compatible with winter hardiness in one plant organism, since the everblooming habit depends on continuous growth while resistance to low temperatures is increased in the dormant state. Since 1961, we have grown more than 15,000 rose seedlings and learned how everblooming and winter hardy roses can be obtained.

The following example should help to illustrate the complex relationships between continuous flowering and winter hardiness. Continuous flowering but tender cultivars of *R. chinensis* and continuous flowering but hardy cultivars of *R. rugosa* were grown together in the field and in the greenhouse. In the field, all cultivars flowered throughout the summer and fall until the termination of growth by frost. Termination of growth in the *rugosa* was accompanied by abscission of the foliage; but in the *chinensis* the dead foliage remained on the plants. In spring, the *rugosa* grew vigorously and

showed little or no winter kill, but the *chinensis* did not survive. In the greenhouse, the *chinensis* were evergreen and continued to flower throughout the entire year without loss of vigour, but the *rugosa* grew and flowered vigorously through part of the year only. Even under the favourable growing conditions in the greenhouse, the *rugosa* abscised the foliage and lost vigour until growth was terminated. At this stage, growth could be induced only after a period of cold storage.

The everblooming habit of the hybrid tea, floribunda, grandiflora and miniature is derived from taxa of *Rosa chinensis* Jacq. and *R. odorata* Sweet. Different forms of these tender species were introduced to Europe during the 18th Century from China and India and soon they became very popular. Hybrids between the imports and the European garden roses of that time are the ancestors of our present garden roses. While the flowers were improved to perfection, the hardiness of the original European ancestors was lost through repeated intercrossing with the tender species and cultivars from China and India.

Some hardy native Canadian species such as *R. palustris* Marsh., *R. setigera* Michx., and *R. woodsii* Lindl. flower repeatedly. Another hardy and repeatedly flowering species, *R. rugosa* Thunb., is native to Japan. It is very well adapted to the climatic conditions of the North American continent and is frequently found as an escapee.

At the beginning of the breeding program it seemed that new everblooming and hardy roses could be obtained through hybridization of *rugosa* and *chinensis* cultivars. Many hybrids of *rugosa* are known but, to my knowledge, only one hybrid of *R. rugosa* x *R. chinensis* was described previously. This hybrid was obtained before 1891 by Bruant of Poitier and described by André as *R. calocarpa*. Regrettably, it is no longer available. We have grown 3562 seedlings from combinations of *rugosa* and *chinensis* cultivars between 1962 and 1970. The hybrids survive the winter at Ottawa without coverage, but they are not as hardy as the *rugosa* parents. Only 28% of the flowering hybrid seedlings flowered continuously. The hybrids from certain cultivars failed to produce flowers. The greatest obstacle to further improvement was the sterility of the hybrids. Only 25 from 3562 seedlings were able to set seeds. The amount of normal and stainable pollen grains varied from 2 to 25% in different hybrids. In spite of low pollen fertility, offspring

was obtained from back crosses. The back cross to the *chinensis* parents produced only tender offspring. The back cross to the *rugosa* parents produced hardy offspring, but very few seedlings compared favourably in appearance of flowers and shrubs to seedlings from *rugosa* parentage only.

The limitations of the backcross method were anticipated and, therefore, efforts were made to improve the parents of the *rugosa* group. Between 1961 and 1964, seedlings from open pollination of 24 *rugosa* cultivars were studied. Only one of these, 'Schneezwerg', produced an interesting offspring. The seedlings showed a great variation in growth habits, armature, foliage and flowers. Generally, they were very hardy, very resistant to blackspot, had a good field resistance to powdery mildew, and flowered repeatedly during the summer.

The *hybrid rugosa* are well known, but rose breeders seem to have lost interest in them. A re-examination of the merits of this group is indicated. Roses of this group do not have exhibition-type flowers, but they have other valuable features not found in present garden cultivars. The shrubs are well balanced, the foliage is attractive and healthy, and some plants might have flowers and hips in the fall. In the fall, when other roses are attacked by blackspot and defoliated, *rugosa* seedlings are free from the disease and well covered with foliage. Different groups of nurserymen who visited our rose field in the fall were impressed by the health of the *rugosa*. One group of seedlings of the parent species, from seeds collected in Japan, appeared resistant to aphids and mites. Regular application of pesticides usually keep various pests under control, but in one year a different sprayer was used which dispersed the liquid with such force that it prevented the spray from reaching the lower surface of the foliage. The result was an abundance of aphids and mites on all 5000 rose bushes grown that year, with the sole exception of the seedlings from the Japanese source. The *hybrid rugosa* do not always compare favourably to the wild type in robust health and winter hardiness, but they flower more profusely and feature a greater variety in flower and shrub forms. Within a relatively short time of 12 years it was possible to improve the *hybrid rugosa* in length of the flowering period, amount of bloom and appearance of shrubs and flowers.

So far, only two seedlings from *rugosa* hybrids were registered. They were named in honour of the explorers Martin Frobisher and Jens Munk. Both cultivars have been tested at different localities across Canada and have been recommended by the majority of evaluators. They are not yet commercially available in Canada.

Fig. 1. R. rugosa hybrid 'Martin Frobisher'

'Martin Frobisher' *(Fig. 1)* derived from open pollination of the *hybrid rugosa* 'Schneezwerg'. Its fragrant, double, pink flowers are most attractive in the bud stage. The open flower is Neyron rose, two-tone, R.H.S. Colour Chart 56A to 56D. The shrub is well balanced and has a good foliage cover. It can be grown as an informal hedge and should make a useful plant for landscaping. 'Martin Frobisher' gained popularity in New Zealand, where it is valued for its abundance of flowers and its drought resistance.

'Jens Munk' *(Fig. 2)* was obtained from a cross of the *rugosa* cultivars 'Schneezwerg' and 'Frau Dagmar Hartopp'. It has been evaluated at Ottawa since 1965 and surpassed 'Martin Frobisher' in winter survival. It has two flushes of bloom, one in June-July and the other in August.

Fig. 2. R. rugosa hybrid 'Jens Munk'

It features the combined attraction of flowers and hips in fall. The flowers are medium-pink, R.H.S. Colour Chart 73B - 73C, fragrant, and the open flowers show the golden stamen in the center. The shrub is vigorous and has a good foliage cover, but it is not as well balanced as the shrub of 'Martin Frobisher'. It makes, as 'Martin Frobisher', a lovely, informal hedge.

Only three hybrids from *rugosa* x *chinensis* shall be described, namely: seedlings H16, H19 and H62. Each of these seedlings is everblooming, resistant to blackspot and powdery mildew, and survives the winters at Ottawa without other protection than the natural snow cover. The vigorous new growth each season soon compensates for the loss of wood during each winter. H16 and H19 were tested since 1965, and H62 was tested since 1970, at Ottawa only. H16 *(Fig. 3)* derived from the *chinensis* cultivar 'Old Blush' and the *rugosa* cultivar 'Frau Dagmar Hartopp'. The very fragrant, phlox-pink flowers have the form of a Hybrid Perpetual. Under the generally prevailing climatic

Fig. 3. Hybrid H16 from *chinensis* and *rugosa* cultivars

Fig. 4. Hybrid H19 from *rugosa* and *chinensis* cultivars

conditions of Ottawa it does not reach its potential for abundant bloom. But in a sheltered location it attains a height of 3 or more meters, produces an abundance of flowers and, at full bloom, it is very attractive. The seedling H19 *(Fig. 4)* is, in my opinion, the most attractive of the *rugosa* x *chinensis* hybrids. Regrettably, it is the only seedling of which the paternal parent is not known with certainty. The maternal parent was 'Schneezwerg'. In spite of severe winter-killing, H19 produces an abundance of flowers throughout the summer until frost. The soft pink flowers are fragrant, semi-double and form a very pleasing contrast to the purple foliage. The most recent addition to the *rugosa* x *chinensis* hybrids, H62 *(Fig. 5)* was obtained from a cross of 'Schneezwerg' x 'Old Blush'. It is one of the very few female fertile hybrids. The shrub is vigorous and well covered with a lustrous foliage and the 2-tone red flowers are very pleasing.

Fig. 5. Hybrid H62 from *rugosa* and *chinensis* cultivars

The *rugosa* x *chinensis* seedlings are interesting because they are new rose hybrids. They might be welcomed by lowers of old-fashioned roses. The *rugosa* hybrids 'Martin Frobisher' and 'Jens Munk' exceed the presently available cultivars of the group in appearance of flowers and shrubs, in hardiness, floriferousness and resistance to powdery mildew, and should make valuable additions to the very few hardy, summer flowering shrubs.