

The Cutting Edge in Hardy Landscape Roses

Dr. David Zlesak, Associate Professor of Horticulture UW-River Falls

There are significant changes underway in the breeding, testing, production, and use of landscape roses. Spurred on by high consumer expectations, recent research, and creative innovation by industry to satisfy customers in a tight economy, there is much to look forward to in upcoming rose introductions. There is an increasing push to regional trialing and marketing of regionally superior cultivars and greater commitment than ever to roses with elevated disease resistance. The best of the new and soon to be released roses Zlesak and colleagues have obtained from leading rose nurseries and have been trialing in the Northern Earth-Kind(R) Observational Rose Trial will be highlighted.

Roses are our national flower and very few landscape shrubs can compare with the season long beauty and interest roses can provide. With a diversity of flower color, plant habits and sizes, fragrance, and foliage characteristics, it is no wonder they are popular and used so freely in commercial and residential landscapes. Those cultivars possessing the highest levels of health and dependability allow for roses to serve as valuable very low maintenance landscape shrubs comparable in care to potentilla, spirea, and hydrangea.

Greatest needs in hardy landscape roses

Disease resistance, cold hardiness, and floral / foliage impact are essential for roses to serve as great landscape shrubs. It is challenging to find roses that combine the very best of all of these. Increased prioritization of disease resistance by breeders and introduction firms has definitely led to many newer roses with significantly better health. There still is a lot to be done with especially advancing increased cold hardiness in our region.

BACKGROUND

During the past few decades there has been a growing trend for the use of roses in low maintenance landscapes and this has been fueled by strategic efforts to identify and develop roses with elevated levels of pest and environmental tolerances. Traditionally, most new American bred roses were developed by nurseries in arid regions of California and selected for superior floral traits. The expectation was that customers across the nation would preventatively spray these chemically-reliant cultivars to ward off disease and then insulate them to survive in colder regions. Besides the relatively steady use of very hardy rugosa roses and to a lesser degree roses like the *Rosa hugonis*, 'Harison's Yellow', and *R. rubrifolia* (aka *R. glauca*) as hardy landscape staples, there were some early breakout cultivars that helped promote roses for general landscape use. In the 1970's we saw Simplicity™ capture significant market share from Jackson & Perkins, the single pink floribunda rose 'Nearly Wild' from 1941 was reintroduced and gained popularity in the 1980's and 1990's, roses from Dr. Griffith Buck from Iowa State University came onto the market in the 1970's and 1980's (Carefree Beauty™ from the mid 1970's is still his most popular cultivar), and then Flower Carpet® roses and Meidiland® roses hit the

international market in the 1990's. The greatest selling and most popular breakout landscape rose cultivar ever is Knock Out®, which came on the market in 1999/2000.

Closer to home. Breeding programs in Canada (Morden/Parkland program in Manitoba and the Explorer program in Ontario) especially helped northern landscapers have a growing range of reliably cold tolerant landscape rose cultivars. In the 1980's and 1990's several very dependable cultivars were introduced that are still staples in our landscapes today. Although the Morden program is in a colder region of the two programs and just North of MN, in general the roses from the Explorer program tend to have greater cane hardiness and health. The Morden research station is on the prairies, so the summer humidity is lower than the Twin Cities and that typically leads to less disease pressure there. Morden also has more routine snowfall that insulates the crowns of plants than the Twin Cities. Most of the Morden introductions have a wonderful compact growth habit and there is a very nice range of flower color and forms. Most have *Rosa arkansana* in their background, a drought tolerant species rose from the Northern prairies. Fortunately, there are some durable and healthy roses from of the Morden program that do especially well for health and hardiness in Twin Cities like 'Prairie Joy'. The Explorer program can be easily identified by the fact that cultivars are named after North American explorers. Early cultivars are rugosa hybrids and include the magenta pink 'Charles Albanel' and the white with pink highlights 'Henry Hudson'. The hardy Explorer climbers are still staples for repeat blooming climbers with the most cane hardy being 'William Baffin' and 'John Davis'. The last group of roses from the Explorer program include small to large shrub roses like 'Frontenac' and 'George Vancouver'.

With the retirement of Dr. Felicitas Svejda (breeder of the Explorer program) in the late 1980's, her program eventually closed. This is when hardy landscape roses were gaining in popularity in cold regions. Nurseries were wondering where they are going to get more superior hardy cultivars with her program continuing to introduce them. Bailey Nurseries and the University of Minnesota both initiated cold climate rose breeding programs with strong selection for disease resistance to help fill this niche. The Easy Elegance® program through Baileys led to close to a few dozen cultivars being released since the early 2000's. There are many wonderfully compact and floriferous landscape shrub roses in a wide range of flower colors and plant habits. Most cultivars are solidly crown hardy in zone 4 with some of the most popular ones including: Sunrise Sunset™, High Voltage™, Sweet Fragrance™, and Super Hero™. The University of Minnesota rose breeding program led by Kathy Zuzek and Stan Hokanson introduced the very floriferous series of compact polyantha roses marketed under the Northern Accents™ series (Sven, Lena, Ole, and Sigrid). They also introduced Summer Waltz™ which is a large flowered pink shrub rose with strong health and hardiness. It is sold in spring through the University of Minnesota Landscape Arboretum spring plant sale as a fundraiser. Unfortunately, the hardy shrub rose breeding program at the University of Minnesota has been discontinued. There are still several promising roses in the pipeline that will hopefully be licensed by nurseries and introduced. Additionally, they are looking for a new nursery to pick up the strong performing Northern Accents polyanthas.

Will Radler, the breeder of Knock Out®, dramatically elevated our expectations for black spot resistance in roses. He is the retired director of the Boerner Botanical Gardens and recognized the average person didn't want to preventatively spray and insulate modern roses, like he did for the 3,000+ roses he oversaw in the garden. He bred roses as a hobby at home in the Milwaukee area. For decades he

strategically prioritized selecting for elevated levels of black spot resistance over generations and this eventually led to Knock Out®. He did this by building upon the cultivars of Dr. Buck and others, promoting disease in his garden, and accumulating and concentrating valuable resistance genes in his roses. Since the original Knock Out® was introduced (listed as hardy to zone 5), there have been other roses added to the Knock Out® series and several additional landscape roses introduced including climbers (e.g. Orchid Romance™, Carefree Celebration™, Carefree Sunshine™, Morning Magic™, and Brite Eyes™).

Opportunities to increase health, hardiness, and ornamental appeal of landscape roses

Health

Great strides have been made with elevating resistance to especially black spot, typically the most troublesome disease of outdoor grown roses in humid climates due to the potential for quick defoliation. There are two main forms of black spot resistance that are found in roses (vertical and horizontal) and recent work at the University of Minnesota (Drs. Stan Hokanson, Vance Whitaker, Jim Bradeen, Kathy Zuzek, and myself) have led to better understanding and tools to study resistance. Breeders can use the information and tools gathered to better characterize the resistance(s) in roses and strategically develop more resistant roses. Their key tool is the international collection of different forms of the fungus causing black spot safely housed in the University of Minnesota mycology collection for use in controlled research.

Other diseases also affect landscape roses in our region such as leaf spot (caused by either cercospora or anthracnose) and powdery mildew. Work to help make advancements in resistance to these troublesome, but typically less problematic diseases, is also of significant value.

Hardiness

Reliable winter survival and strong regrowth is essential to the use of roses as landscape shrubs. If they don't survive, they are just beautiful annuals in our climate. Most roses sold as hardy landscape additions in our climate are crown hardy. This means that come spring there should be enough live tissue at the base of the plant for it to rebuild throughout the spring and summer and make an acceptable landscape addition and does not decline over the years. Depending on the winter, crown hardy roses may die to the soil or snow line. If in a protected site and a mild winter is encountered, many may have significant amounts of live wood above the snowline as well. In spring as we can tell where new growth is coming from, dead wood can be pruned away. Heavy yearly pruning to remove dead wood typically keeps the plant compact. Own root plants help to avoid the problem of rootstocks suckering and losing the original cultivar and having the stems be replaced by rootstock.

One challenge with how roses are rated for hardiness is that it is typically an educated guess. Different nurseries can have different standards for how they determine their zone ratings. Some use the coldest zone at which plants typically live. Others use the coldest zone plants not only live, but typically are able to rebound in size to make useful and consistent landscape additions. There are some climbers on the market listed as hardy to zone 3 or 4 and typically die back to the snow or soil line. Although the plants

may live and regrow, it may be more fair to rate them to a warmer climate so the purpose of having them serve as climbers can realistically be achieved. Understanding the level of dieback to expect and if that matches our needs for a rose is essential. It can be difficult to find such information. Take advantage of learning the experiences with various cultivars from friends as well as visiting public gardens where roses are not insulated for winter (e.g. University of Minnesota Landscape Arboretum shrub rose garden on the three mile drive) and compare performance for yourself.

Roses on the borderline for hardiness can lead to significant problems in our northern landscapes. For instance, if one has a mass planting of the same cultivar or a mix of marginal cultivars, having some plants die, some struggle to rebound, and others rebounding satisfactorily can lead to an unwanted haphazard look and compromise the landscape design. Additionally, if one doesn't get to pruning roses right away in spring before the new growth gets too long, it can be hard to carefully prune out the dead wood without damaging the new growth. It takes multiple years of observing roses to get a good feeling for the relative hardiness of a rose. Fortunately, breeding for increased winter hardiness is relatively straightforward. It just takes commitment and typically multiple generations to combine elevated levels of hardiness with other valued traits such as repeat bloom and disease resistance.

Although the North is an overall small component to the total national sales of landscape roses, breeding efforts to increase the cane hardiness of roses is being done by especially cold climate hobby breeders and regional nurseries like Bailey Nurseries. ***It would be nice to have more roses that are hardy enough that we can prune them heavily each spring only if we want to, not because we have to!***

Expanding the ornamental range of hardy landscape roses

As time went by, the range of floral and plant habit traits has expanded in hardy shrub roses and continues to do so. Today we have hardy roses available in many colors and forms. When one considers using roses in the landscape, it is important to consider not only the flowers, but also the foliage and the range of colors and textures that are available. Some roses have new growth that emerges red, bronze, or green. Mature foliage can have many small lacy leaflets or fewer larger leaves that are more coarse. Mature foliage can come in a range of colors as well from light to dark green and even grey-green to blue-green. Considering how the foliage and flowers complement each other can also bring interesting and valuable artistic components to landscape design.

CHANGES IN THE PRODUCTION AND DISTRIBUTION OF ROSES AND HOW THAT MAY INDIRECTLY HELP US HAVE ACCESS TO MORE HARDY LANDSCAPE ROSES

There have been significant changes in recent years to rose production systems, nurseries growing and distributing roses, breeders in the marketplace, and rose trialing programs in the US. Following are some highlights to these changes with emphasis on how that affects the production and availability of regionally adapted hardy landscape roses.

Years ago, most roses were budded onto rootstock and sold as field grown plants from primarily California and Texas. Even hardy roses that would propagate and do well on their own roots were budded because budding fit into the overall production system. Plants were harvested after they went

dormant after their second year in the field and sold as bareroot plants directly to consumers through mail order or as packaged bareroot plants at retail nurseries. Other plants were purchased by regional nurseries and potted in early spring and forced into bloom for Mother's and Memorial Day target dates.

Due to increased land prices in California and Texas and difficulty in affording and getting trained bud grafters, field production of grafted roses by key growers supplying the whole US market is diminishing. Instead, roses are increasingly being produced by cuttings without grafting. New cultivars are selected in part for being vigorous enough to be grown as own root plants and not require grafting onto a more vigorous rootstock. Cuttings are typically rooted in plug flats under mist in the greenhouse or open ground sand beds in greenhouses. Young plants may be transplanted in the field for a single season to produce an own-root bareroot plant. More commonly these days, young plants are transplanted to the final one or two gallon container they will ultimately be sold in. Compared to the traditional two year field grown system, up to a year can be shaved off the production time, especially if plants are solely container grown.

Without large California, Texas, or Arizona growers being the gatekeepers to the roses we can find in the North opens up a lot of opportunity for greater diversity of roses in the marketplace and roses that are more regionally adapted. Before, if a Northern adapted rose couldn't tolerate the summer heat well in CA, TX, and AZ, it would often not be readily available. Plug flats of rooted cuttings can now be shipped from propagation greenhouses located anywhere to regional nurseries where adapted cultivars can be grown on to salable size near consumers. These finishing nurseries typically grow a diversity of plant species and roses are often just a modest component of their sales.

The economic environment that has led to more regional production and reduced production time to salable product can actually help make regionally adapted rose cultivars more feasible, where before large national rose nurseries typically didn't cater to the far North.

The following data was presented by Pemberton and Karlik at the Sixth International Symposium on Rose Research and Cultivation in August 2013 in Hanover, Germany.

There is a huge shift from higher care hybrid tea, grandiflora roses and floribunda roses to the generally lower maintenance shrub roses. In 1988 shrub roses comprised ~20% of rose sales and today they are about 50% of the national sales of roses.

For container grown plants available at the retail nursery, only ~20% of them are bud grafted. Grafted plants were field grown and then potted and forced for sale. Another 20% of the potted plants were propagated from cuttings, grown for a season as own root plants in the field and then potted. The final 60% of potted plants sold in the retail garden center never saw the field. They were propagated from cuttings and potted and grown on in their final container until sale.

ROSE TRIALING PROGRAMS IN THE UNITED STATES

All-America Rose Selections (AARS) was once the predominant rose trialing program in the US (it began in 1938). AARS was grower led and with about half of the member nurseries going out of business in

recent years the organization disbanded a couple years back. The goal was to trial new roses coming onto the market and endorse the roses that were above average in all climates with the award. Unfortunately, this model did not allow for regionally superior roses to be recognized.

Earth-Kind® is a regional landscape rose trialing program that trials roses in a scientific manner for multiple years throughout a region representing different typical soil types and growing conditions in the region. Roses earning the Earth-Kind® regional designation are promoted giving confidence to consumers that if given basic plant care, these roses are highly likely to be successful for them. Data from regional trials are published in scientific journals for transparency and credibility. Earth-Kind® started in the South Central US and in the near future the first roses having gone through the trialing program in the North will be designated as Northern Earth-Kind® roses.

With the disbanding of AARS, two new rose evaluation programs meant to be shorter term trial for newer roses coming onto the market are emerging. One is the American Garden Rose Selections (AGRS), which is patterned after the German ADR trials. The other is the American Rose Trials for Sustainability® (A.R.T.S.) which is more closely aligned to the Earth-Kind® trials and will serve as a stepping stone for roses going into the longer term Earth-Kind® trials. Winners will be determined and promoted regionally for both programs and both programs will not be preventatively sprayed with fungicides.

The American Rose Society led Award of Excellence (AOE) trials has traditionally been geared towards exhibition miniature roses and they have been preventatively sprayed with fungicides. Recently these trials have been opened up to all compact roses including compact shrub/landscape roses. Additionally, there is both a spray and no-spray component to the trials and breeders can select which they want their rose to be entered in.

CURRENT KEY BREEDING EFFORTS IN HARDY LANDSCAPE ROSES / SOURCES OF IMPROVED CULTIVARS

Today, improved hardy landscape rose cultivars continue to be developed and introduced. Some of the newest roses are from familiar sources, while some are coming from new sources. A high level of black spot tolerance is no longer just nice, but is now essential for a rose's success in the landscape rose marketplace. Sometimes the degree of resistance to the various forms of the fungus causing black spot isn't fully known until a rose is released and then more fully tested across a geographical range by consumers (e.g. Baby Love™ was touted as highly resistant to black spot, but falls apart quickly with some forms of the fungus). Over time the best plants tend to become evident and move to the forefront.

Key North American Breeders of Hardy Landscape Roses

Bailey Nurseries Continued effort is being made to add superior new cultivars to the Easy Elegance® series. High levels of health and hardiness are prioritized more than ever as they select roses in their trial beds in Minnesota. The introduction rate of newer roses to the collection has slowed down to focus on adding only the very best to the core group of exceptional Easy Elegance® cultivars.

Vineland The Morden/Parkland landscape rose breeding program has recently closed and there is a new effort that is partially government funded and led by Vineland in Ontario. They acquired breeding stock from Morden and are crossing those roses with popular cultivars possessing high levels of health.

Will Radler Will continues to breed roses at his home in Greenfield, WI and has many wonderful roses in the pipeline including some healthy roses that are more cold hardy than Knock Out®.

There are multiple independent hobby breeders in our region that have been working for years towards roses with elevated hardiness levels combined with high levels of health for our climate. They include Joe Bergeson, Chuck Bock, Paul Geurts, Julie Overom, Kathy Zuzek, and myself.

A Strong International Presence

Meilland International (Southern France) The Drift® series of compact, floriferous landscape roses with good crown hardiness in our region are gaining popularity. Early reports are that these roses perform well across multiple climates. Meilland is making progress in typical larger flowered roses not only for health, but also fragrance. However, these roses benefit from some insulation in our climate for winter. Francis Meilland™ and Dee-Lish™ are some recent hybrid tea roses with elevated health and fragrance.

Kordes and Sonne (North Central Germany) Kordes is making strong headway into the US market. Jackson & Perkins used to be their US introducers and not many Kordes roses were introduced. That relationship is now severed. Over 25 years ago Kordes stopped spraying their seedling fields for outdoor grown landscape/garden roses of all types as they saw the resistance to public acceptance of pesticide use building. In trials in MN and WI many of their roses have strong levels of black spot resistance, but most could benefit from some insulation for winter. They have the Fairytale®, Vigorosa®, Climbing Maxx®, and Kolorscape® series of roses. In the past couple years they have introduced fragrant healthy hybrid tea roses like Beverly™ and Pink Enchantment™. The Kolorscape® roses are making the strongest headway into the US marketplace reaching MN and WI box stores in 2013. Many Kolorscape® roses have Knock Out® in their background and have been selected to be compact and floriferous, like Knock Out®, with single to semi-double blooms. Lemon Fizz™ is an especially nice rose in the Kolorscape series possessing rich yellow blooms on a mounded plant that resists fading well.

David Austin Roses Limited (aka English Roses) David Austin roses is moving towards greater prioritization of health and a more manageable / compact plant habits. They have their own production and distribution facilities in CA and TX and are negotiating having a trial site in Minnesota as their US cold climate testing site.

During the presentation I will highlight pictures and general performance information on newer cultivars from newer landscape rose plantings I host or coordinate in MN/WI, upcoming roses I have seen in my travels and have in my own breeding program, as well as tried and true rose cultivars that have a strong track record for our climate.

Here is one of the observational trial beds at UW-River Falls where I plant out new landscape roses to observe their relative hardiness and health.

